Impact of WTO on SPS Compliance for Orthodox Tea and Government Revenue

A Dissertation Submitted to the Faculty of Humanities and Social Sciences Tribhuvan University in Fulfillment of the Requirements for the Degree of DOCTOR OF PHILOSOPHY in ECONOMICS

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LETTER OF RECOMMENDATION

We certify that the thesis entitled "Impact of WTO on SPS Compliance for Orthodox Tea and Government Revenue" submitted by Surendra Kumar Uprety to the Office of the Dean, Faculty of Humanities and Social Sciences, Tribhuvan University for the degree of Doctor of Philosophy of this University, was completed under our supervision and guidance.

This thesis is the candidate's original research work. We have carefully read this final work. We are fully satisfied with the language and substance of this Dissertation.

To the best of our knowledge, the candidate has fulfilled all the other requirements of the Ph. D. program of Faculty of Humanities and Social Sciences, Tribhuvan University. We, therefore, recommend that the dissertation be considered for the award of Ph. D. Degree.

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DECLARATION

I hereby declare that this Ph.D. dissertation entitled "Impact of WTO on SPS Compliance for Orthodox Tea and Government Revenue" submitted to the Office of the Dean, Faculty of Humanities and Social Sciences, Tribhuvan University is an entirely original work prepared under the guidance of my supervisor. I have made due acknowledgement to all ideas and information borrowed from different sources in the course of writing this dissertation. The results presented in this dissertation have not been presented or submitted anywhere else for the award of any degree or for any other reason. No part of the content of this dissertation has ever been published in any form before. I shall be solely responsible if any evidence is found against this declaration.

Date: March, 2013

Surendra Kumar Uprety

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ABSTRACT

When liberalization has been emerged as a functioning framework in the economy, it has very often attributed some far reaching implications especially for the economies of developing and the least developed countries in two crucially important external economic domains (in international trade), i. e., in exports and in imports although foreign direct investment (FDI), and labor mobility are also some important domains. However, the contemporary history of international trade witnesses a marked progress in lowering barriers to trade, particularly the tariffs over the last six decades, the practice of non-tariff barriers has widely been adopted. These measures have resulted in the World Trade Organization (WTO) agreements in Technical Barriers to Trade and Sanitary and Phytosanitary (SPS) regulations. With the world-wide reduction in tariffs under the auspices of the General Agreement on Trade and Tariff (GATT)/WTO standards and, more generally, non-tariff measures have further gained importance in the world trade. This trend also reflects the growing concerns over product quality and consumer health and safety. As this quality compliances of exportable commodities, within the SPS framework, involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength. On the other hand, these countries also have to face revenue loss, specially the trade tax revenue, from import due to reduced tariffs regime, because of the agreements in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries governments' revenues are hugely supported by custom duties. Therefore, a country has to bear the dual costs of compliance – both in export (the SPS quality compliance costs) and in import (revenue loss resulted from reduced tariff regime within trade liberalization framework) - to be benefitted from the WTO and economic liberalization.

This dissertation measures the cost of SPS compliance of Nepalese highland orthodox tea as the case study on the basis of ISO: 22000 applying double log linear regression model. Based on the survey of primary data as per the ISO: 22000 compliance components, this study finds that there is a significant additional cost incurred (average 44.86%: Small Scale 57.24%; Medium Scale 45.10%; and Large scale 42.38%) to comply with the stringent SPS specifications. Likewise, another aspect of the implication attributed by economic liberalization and hence in the WTO framework is revenue impact on the government. It basically addresses the tariff revenue concerns that Nepal has been responding in the context of the current multilateral trade negotiations under the Doha Development Agenda. This study thus analyzes the revenue impact with reference to Nepal's time series macroeconomic data of 1974-75 to 2010-11 by comparing the pre- and post-liberalization periods applying Phillips-Hansen Fully Modified Ordinary Least Squares Model coupled with Error Correction Modeling of co-integration method. The results of the analysis indicate that the impacts of trade liberalization measures on the government revenues are not found to be significant in most of the cases. But, Nepalese economy has become more open in the post-liberalization period as the trend of openness indexes reveals increasing trade to GDP ratio and decreasing trade tax to import ratio.

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ACRONYMS

ADB	Asian Development Bank
ADF	Augmented Dickey Fuller
AEG	Augmented Engle Granger
AIC	Akaike Information Criterion
AIDS	Almost Ideal Demand System
APCFT	Average Perceived Constraint in Implementing ISO 22000
APDISO	Average Perceived Difficult Aspects Implementing ISO 22000.
APEC	Asia Pacific Economic Cooperation
APPCT	Average Perceived Policy Related Constraint for Food Safety-
	Related Quality Issues
APQCT	Average Perceived Food Safety-Related Quality Issues
	Constraining Tea Industry
APS	Assured Produce Scheme
ATPC	African Trade Policy Center
BoP	Balance of Payment
BRC	British Retail Consortium
CBS	Central Bureau of Statistics
CC	Cost Components
CCPs	Critical Control Points
CEO	Chief Executive Officer
CERT	Certification
CET	Common External Tariff
CGE	Competable General Equilibrium
СР	Crop Protection
CTC	Crushed-Turn-Curled
DDA	Doha Development Agenda
DF	Dickey Fuller
DiD	Difference-in-Difference Model
DRK	Document & Record Keeping and Self Inspection
EAC	Eastern African Community
ECOM	External Communication
EG	Engle Granger

ESAF	Enhanced Structural Adjustment Facility
EU	European Union
EURAPGAP	European Retailers Protocol for Good Agricultural Practice
FAO	Food and Agriculture Organization
FC	Fixed Cost
FDA	Food and Drug Administration
FDI	Foreign Direct Investment
FLO	Fair Trade Labelling Organization
FMD	Food and Mouth Disease
FNCCI	Federation of Nepalese Chamber of Commerce and Industry
FSIS	Food Safety and Inspection Services
FTA	Free Trade Area
FU	Fertilizer Use
GATS	General Agreement on Trade in Service
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GFSI	Global Food Safety Initiatives
GMP	Good Manufacturing Practices
GTAP	Global Trade Analysis Project
ha	Hectare
НАССР	Hazards Analysis and Critical Controls Points
HMG	His Majesty's Government
HMG/N	His Majesty's Government, Nepal
НОТРА	Himalayan Orthodox Tea Producers Associations
HP	Harvesting & Pruning
IBS	IFOAM Basic Standards
ICFTU	International Confederation of Free Trade Union
ICOM	Internal Communication
IER	Indian Excise Refund
IFIs	International Finance Institutions
IFOAM	International Federation of Organic Agricultural Movement
IMF	International Monetary Fund
INGO	International Non-Government Organization
IPPC	International Plant Protection Convention

IRFR	Irrigation or Fertigation
ISO	International Standardization Organization
ISPM	International Standard for Phytosanitary Measures
ITC	International Trade Center
ITO	International Trade Organization
kg	Kilogram
KIPPRA	Kenya Institute for Public Policy Research and Analysis
LA	Lab Analysis
LDC	Least Developed County
lnPCRGDP	Natural Log of Per Capita Real Gross Domestic Production
lnPOP	Natural Log of Population
MFN	Most Favoured Nation
MRL	Minimum Residual Level
MTA	Multilateral Trade Agreement
NAMA	Non-agricultural Market Access
NCC	Nepal Chambers of Commerce
NGO	Non Government Organization
NPC	National Planning Commission
NRB	Nepal Rastra Bank
NTBs	Non-Tariff Barriers
NTDC	National Tea Development Cooperation
NTM's	Non-Tariff Measures
NTT	Non-Trade Tax Revenue with Respect to GDP
OECD	Organization of Economic Cooperation and Development
OECS	Organization of Eastern Caribbean States
OIE	Office of the International Des Epizooties
PH	Produce Handling
PHFMOLS	Phillips-Hansen Fully Modified Ordinary Least Squares
PP	Phillips Perron
PTA	Pulrilateral Trade Agreement
QMS	Quality Management System
RA	Risk Management
REER	Real Effective Exchange Rate
RM	Malaysian Ringgit

RNTT1F	Residual of Non- trade Tax Revenue First Regression in Pre
	Liberalization Period
RNTT1S	Residual of Non- trade Tax Revenue First Regression in Post
	Liberalization Period
RNTT2F	Residual of Non- trade Tax Revenue Second Regression in Pre
	Liberalization Period
RNTT2S	Residual of Non-trade Tax Revenue Second Regression in Post
	Liberalization Period
RTR1F	Residual of Tax Revenue First Regression in Pre Liberalization
	Period
RTR1S	Residual of Tax Revenue First Regression in Post Liberalization
	Period
RTR2F	Residual of Tax Revenue Second Regression in Pre
	Liberalization Period
RTT1F	Residual of Trade Tax Revenue First Regression in Pre
	Liberalization Period
RTT1S	Residual of Trade Tax Revenue First Regression in Post
	Liberalization Period
RTT2F	Residual of Tax Revenue Second Regression in Pre
	Liberalization Period
RTT2S	Residual of Tax Revenue Second Regression in Post
	Liberalization Period
RTT2S	Residual of Trade Tax Revenue Second Regression in Post
	Liberalization Period
SAP	Structural Adjustment Program
SAWTEE	South Asian Watch on Trade, Economics and Environment
SBM	Soil and Substrate Management
SM	Site Management
SNA	System of National Accounts
SPS	Sanitary and Phyto-Sanitary
TBT	Technical Barrier to Trade
TC	Technical Committee
TIM	Trade Integration Mechanism
TRIMS	Trade Related Intellectual Measures

TRIPs	Trade Related Aspects of Intellectual Property Rights
TS	Technical Service
TWIN	Third World International Network
UAE	United Arab Emirates
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar
VAT	Value Added Tax
VC	Variable Cost
WB	The World Bank
WHO	World Health Organization
WHSW	Worker Health, Safety and Welfare
WPM	Waste and Pollution Management
WTO	World Trade Organization

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CHAPTER I

INTRODUCTION

1.1 Background of the Study

The contemporary history of international trade has witnessed a remarkable progress in integrating the world economies through the rule-based multilateral trading regime by lowering barriers to trade, especially the tariffs along with the initiatives taken since the Brettonwoods Conference in 1944. The underlying idea and the conceptual origin of the rule-based multilateral trading regime was to promote economic development with equity and equality by optimizing the exploitation of resources available rationally in freer, nondiscriminatory ensuring the maximum predictable degree of freedom in international trade. General Agreement on Trade and Tariff (GATT) was then established as a functional body to facilitate the rule-based trade, which was concluded in the Uruguay Round Negotiations on the administration of international trade and investment establishing the World Trade Organization (WTO) in 1995 accomplishing a number of successful reforms in liberalizing the trade and economies in many countries in the world. Following this regime of liberalization, many developing and the low income countries including Nepal have started to reform their economic policies in the late seventies and eighties of the last centuries and accelerated further in the nineties. These reforms are, in fact, supported by some fundamental assumptions - trade liberalization increases trade flows across the economies and promote freer trade; which helps increase in consumer welfare through competitive market regime, raise government revenue through the increased volume of trade flows that keeps balance of payment favorable, and results in overall macroeconomic stability. However, this doctrine of trade liberalization has invited two serious implications for developing and the least developed countries. First, however, the tariffs are declined, the importance of non-tariff barriers are increased. More recent efforts to regulate such measures have resulted in WTO Agreements such as Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) compliance. Such systems involve regulatory measures, policy re-orientation, and development of the necessary infrastructure, re-organization of the supply chain, enhanced capacity building and a forward looking strategy, particularly for exports,

which involves costs for the exporting countries (Shafaeddin. 2007). Second, these countries have to face revenue impact due to reduced tariffs regime, which brings about an important implication as the government these countries' revenue have substantially been supported by custom duties (Henson et al., 2000).

The liberalization in trade and economies of the developing and the least developed countries have thus twofold implications: the first is stringent quality compliance of the product in conformity with the international standard such as SPS measures applicable to the production of commodities in the domestic economy and their export to the international markets, while the next is revenue impact. Because, successive rounds of global trade liberalization have substantially reduced tariff barriers to trade and they are, very often, claimed to have remained the potential source of fiscal instability for developing and least developed countries due to their high dependence on trade taxes for public revenue. Therefore, developing and the least developed countries under trade liberalization regime, have to bear the dual costs of compliance and achieve rapid economic growth – both in export and import – to be benefitted from the WTO and economic liberalization.

1.1.1 An Overview of Quality Compliance in Exportable Products

As consumers in industrialized countries are increasingly concerned about the standards related to food safety, governments tend to use a variety of measures to ensure that the products are protected from contaminants, toxins and other organisms that may affect human health. These standards, for example the SPS measures, seem to be important to protect human health and the health of animals and crops from pests and other diseases that may be transmitted by cross-border trade of food, plants, or animals. In parallel, consumers, retailers, and processors have been developing their own quality standards. These compliances of quality standards impose significant costs to the producers and exporters of the developing and the least developed countries.

Although food safety and agricultural health standards are designed to manage risks associated with the spread of plant and animal pests and diseases and the incidence of microbial pathogens or contaminants in food, standards also can be used as a trade protection measure. There is growing concern within the

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international development community that standards undermine the competitive progress already made by some developing countries and present insurmountable barriers to new entrants into the agri-food trade. There are a number of concerns for developing and the least developed countries such as the emerging food safety and agricultural health measures have been applied in a discriminatory manner, and at the same time, these countries lack the administrative, technical, and other capacities to comply with new or more stringent requirements. Likewise, the costs incurred to reach compliance undermine the comparative advantage of developing countries in the high-value food trade. Again, institutional weaknesses and compliance costs further marginalize weaker economic players such as the enterprises and farmers of low income countries. On the other hand, supports available for capacity-building in this area are inadequate, despite the provisions made in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures.

As the quality compliance of exportable commodities, within the SPS framework, involves significant costs, the burden of cost of compliance is entirely on the exporters despite the fact that their capacity for the compliance is limited. In fact, the literature often disregards the cost of loss of exports, or rejection of products at the border of an importing country, the existing organization of supply chain in poor countries would result in the lack of export expansion. More specifically, the main characteristics of the SPS agreement and the related measures applied by the developed countries are such that they require a complex, difficult and high cost SPS system. Such a system involves regulatory measures, policy re-orientation, and development of the necessary infrastructure, re-organization of the supply chain, enhanced capacity building and a forward looking strategy, particularly for exports (Shafaeddin, 2007). The preparation for the compliance is also difficult for the poor countries as it is knowledge intensive, requires a learning period, training and a close cooperation between the public and private sector in various stages of the supply chain. Yet the socio-economic cost of the lack of compliance is enormous.

The cost of complying with food safety and agricultural health standards has, therefore, been a major concern among developing and the developed countries. Many studies see standards as an absolute barrier to trade for poorer developing countries because the costs of meeting them are assumed to be prohibitively high. However, the available evidence indicates that, in many instances, the costs are less than assumed, especially relative to the value of exports. But still there is a generalization of the studies that the application of product regulations and standards is becoming increasingly contentious as an implicit non-tariff barrier to trade, and many developing countries have been facing increasing constraint of stringent SPS regulations that vary across their export markets, require duplicative conformity procedures, and seem to change capriciously in order to exclude imports. Some developed countries are adopting mutual recognition agreements that may lower costs for their trading firms but could result in greater discrimination against countries that do not belong to them. Substantial anecdotal evidence suggests that compliance costs with regulations can be high in relation to the value of products, which could deter entry into export markets altogether.

1.1.2 Revenue Impact of Trade Liberalization: An Overview

Over the last three decades, developing countries have experienced extensive and rapid trade liberalization, spurred by both multilateral trade negotiation and the conditionality related to Structural Adjustment Programs (SAP) agreed with the Bretton Woods Institutions. At the same time, most of the developing and the least developed countries have liberalized their trade systems after long protectionist experiences by a rapid elimination of quantitative restrictions, and significant reductions in tariff to low and uniform levels. But the initiatives of trade liberalization have resulted in a sharp decline in the overall revenue derived from customs duties and trade taxes. Reflecting commitments under trade liberalization agreements, as well as unilateral decisions, the collected import tariff rate fell by almost half since the mid-1980s and the trend has been most pronounced in low-income countries; however, even middle- and high-income countries experienced a sharp decline in the share of trade-derived revenue to GDP (IMF, 2005).

Tariff revenue concerns have emerged as an important issue in the framework of multilateral trade negotiations under the Doha Development Agenda (DDA). The July framework agreement explicitly identified the tariff revenue issue as a challenge for countries dependent on revenues from import tariffs and instructed the negotiating group on Non-agricultural Market Access (NAMA) to take into account the particular needs that may arise for the members concerned. After successive Uruguay Round negotiations and the creation of the WTO, many developing countries chose to dismantle their trade barriers and open their economies to international competition. As liberalization of the economies was instrumental in lowering import tariffs and removing import restrictions, the developing countries are in dire straits for fiscal adjustment and maintaining favorable balance of payment, which is crucial for the macroeconomic stability.

Although, evidences on possible revenue consequence of tariff liberalization are varied, there is a general agreement that revenue consequences of trade liberalization have hinged, to a considerable extent, on the share of tariff revenue in total revenue of a country. As a rule, developing countries tend to rely heavily on trade tax revenue (ATPC, 2004 and Kubota, 2000). During the initial stages of trade reform, when non-tariff barriers are transformed into tariff barriers (tariffication of NTBs) and export subsidies are reduced and then eliminated. Under these circumstances, the country experiences pressure from declining sources of revenue. The net effect of tariff reductions on revenue income remains uncertain; much depends on the initial structure of the tax system and the administrative capabilities of the particular country (Ebrill et al., 1999; Keen and Ligthart, 2002). Negative fiscal impact may originate from the possibility that domestic revenue might not rise sufficiently to offset the fall in international revenue earnings due to tariff reductions. In addition, reduction in export taxes may lead to a decline in export revenues either through lower export tax revenues or through lower income earned from exports.

On the contrary, there could also be favorable and positive impact of trade liberalization as a result of elimination of trade related subsidies and tariff reductions. For example, decline in revenue from tariff reductions can be offset by the additional revenues derived from the increased import volume which is generally elastic as a result of lower prices of the imported commodities. There is also a possibility that lower tariffs may lead to an increase in the overall tax base of the country by lowering the marginal benefit to avoid taxation. Reducing tariff dispersion around a relatively constant average rate can also have a positive revenue impact in the sense that goods subject to higher tariffs are characterized by a high price elasticity of demand (ATPC, 2004). Higher tariffs create an incentive for importers to evade taxes by seeking exemption, which in turn, affects the productivity of the tax system and reduces
revenue (Pritchett and Sethi, 1994). Tariff reduction could thus lead to an increase in the overall revenue of the country.

1.1.3 Economic Liberalization and Nepalese Economy

Outward oriented liberal development strategy was started in Nepal since the mid 1980s with the SAP in two major fronts of the economy. Gradual liberalization of foreign trade was initiated by dismantling quantitative restrictions and simplifying the industrial licensing regime. Tariffs including sales tax, excise duties and additional duties were gradually reduced and dispersions in tariff rates were narrowed. Bias against exports was reduced through a real devaluation of the rupee and simplification of export procedures. Furthermore, a number of exportable items enjoyed preferential treatment under the generalized system of preferences scheme. Likewise, the second front was the liberalization of financial sector through the open policy. Exchange rate has been made market responsive and commercial banks are allowed to set their own interest rates.

Trade liberalization has come into a comprehensive regime along with the establishment of the World Trade Organization (WTO), successor to the General Agreement on Tariffs and Trade (GATT) to deal with the rules of trade between nations at a global or near-global level. Amidst this environment, one of the key issues that currently rose in the developing and least developed world, which, in fact, called a wide academic debate, is whether trade liberalization or the WTO regime really brings about positive impacts on developing countries' trade. Scholars have diverse stands on this issue. It is generally agreed that developing and least developed countries within the trade liberalization regime and multilateral trading framework of WTO have been implicated in a mandatory choice – achieve economic growth facing tough challenges. First, the country can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages only when the products are able to meet the stringent quality standard – the SPS measures - in developed countries' markets. As this quality compliance of exportable commodities involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength. On the other hand, these countries also have to face revenue loss from import due to reduced tariffs regime, as agreed in non-agricultural market access framework of WTO. This implication is very

important because in many developing and low income counties, government revenue is hugely supported by import duties. Therefore, a country has to bear the dual costs of compliances.

1.2 Statement of the Problem

Remarkable progress has been made over the last six decades in lowering barriers to trade, particularly the tariffs. This regime has drawn a greater attention over time along with the inception of trade reforms as many developing and the least developed countries liberalized their economies in recent decades, and these are further accelerated with the implementation WTO agreements. Liberalization of economy through the reforms in macroeconomic policies was, in fact, supported by a neoliberal doctrine – trade liberalization increases trade flows across the economies and promotes freer trade, which helps increase in economic growth, generate employment, promote consumers' welfare through competitive market, raise government revenue by the increased volume of trade flows that keep balance of payment favorable, and results in macroeconomic stability. However, the trade liberalization and the introduction of WTO have invited two serious implications for developing countries and low income countries like Nepal. First, these countries have, prima facie, to face revenue loss due to reduced tariffs regime. This becomes very important policy issue as many developing and low income countries government revenue are substantially contributed by import duties. Second, however, as tariffs have declined, the importance of non-tariff barriers has increased, due to some proliferation in this area as well as wider recognition of the trade impact of existing measures.

In such a context, Nepal has become a member of the WTO. Assessment of all these issues demand an in-depth research study, which has not been conducted so far, that is on the compliance impact of trade liberalization and WTO on the Nepalese economy. No less necessary is the assessment of how an under-resourced economy will be able to acquire benefits from multilateral trade practices, and what aptitudes and precautions have to be taken.

1.3 Objectives of the Study

When liberalization is emerged as a functioning framework in the economy, it has very often attributed some far reaching implications especially for the economies of developing and the low income countries in two crucially important external economic domains (in international trade), i. e., in exports and in imports. While, the concerns on the impacts of economic liberalization in WTO regime for the low income countries' economies demand an in-depth study, the general objective of this study is as follow.

1.3.1 To assess the SPS compliance costs as per the WTO conditions on Nepalese orthodox tea and analyze revenue impact of trade liberalization.

In order to accomplish the overall objective, the following specific objectives have been set.

- i. To study the evolution of trade liberalization and WTO regime and examine the trade opportunities and challenges for developing and the least developed countries,
- To study the performance of Nepalese trade and assess the impact of WTO and trade liberalization policies with special reference to the export of Nepalese orthodox tea and customs revenues,
- iii. To analyze the understanding of SPS compliance for agri-products and assess the costs of ISO 22000 compliance to Nepalese highland orthodox tea, and
- iv. To analyze the impacts of trade liberalization on Nepalese tax and non- tax revenue under the WTO framework.

1.4 Limitations of the Study

From the very inception of multilateral trade regimes under economic liberalization including in the WTO framework, and especially after the Doha Round negotiations, some issues related to global economic integration have emerged as far reaching implications for the developing and the least developed countries with critical concerns of their macroeconomic stabilities. Literatures have widely imparted different thoughts on this issue such as economic openness facilitated by the WTO and the generation of economic growth and development, reduction of poverty, inequality and unemployment, sustainable development, and attainment of a favorable balance of payment (BoP). Likewise, developing and the least developed countries have been implicated by the Doha Development Agenda (DDA) such as non-agricultural tariffs including textile and telecommunication issues, trade and

environment, anti-dumping and subsidies rules, rules on investment and capital flows, competition policy, trade facilitation, transparency in government procurements, implications of intellectual property rights, absorption of aid for trade, issues on biodiversity, etc are emerged very important which need in-depth research and study. This study thus has the following limitations:

- i. This study is concentrated only on the most important issues of DDA the implication of WTO rules on the SPS compliances for Nepalese exportable product. Therefore it has assessed the costs of ISO 22000 compliance for Nepalese highland orthodox tea only.
- ii. In the revenue implication of trade liberalization front, the impacts of tariff liberalization only on Nepal's customs revenues have been analyzed. For this, the study has taken fiscal year 1974-75 as the starting year to analyze the revenue impact of trade liberalization since the data required prior to this date are not available.

1.5 Focus of the Study

Amidst, the concerns on the impacts of economic liberalization with WTO regime and its impact on the least developed countries' economies, this study has focused on the compliances and their costs in Nepalese export and revenue impact – especially the trade tax revenue impact of trade liberalization in the import front. This research has taken tea industry as a case study to analyze the SPS compliance costs in WTO regime as the export potential appears highest for this industry in terms of employment generation, revenue collection, and socioeconomic sustenance among agricultural products. Also, the tea processing industry is seen as a potential growth industry and an important channel for reducing poverty due to strong linkages to rural communities. It serves as an illustration of the issues facing commercial and estate farming. Large areas of Nepal are suitable for tea plantations, and global demand for orthodox tea continues to grow. Likewise, considering that many developing and the least developed countries like Nepal rely heavily on trade tax revenue, and a reduction or elimination of these taxes may be a source of their fiscal instability, this study has analyzed trade tax revenue impact on the Nepalese economy.

1.6 Importance of the Study

Nepalese economy, in the recent years, has emerged with new opportunities and challenges along with the shift of macroeconomic policy – market liberalization in the early nineties of the last century, and more recently, the globalization. The changes and challenges brought by the liberal market economy are now the issues that have far-reaching implications. The opportunities and threats offered by market liberalization seem to be a matter of concern in Nepal's involvement with the WTO. This concern, at the same time, has produced a debate: Is the WTO, under the current macroeconomic foundation, an instrument to accelerate economic growth or is it a mere compliance?

It is a common expectation that connecting Nepal's economy with the WTO framework has a significant upshot on the domestic economic environment, and there would be potentially an increase in trade flows of both goods and services as it contains several broad elements: improved market access, more technical assistance, and support for agencies working on the diversification of LDC economies' help in following the work of the WTO. In addition, trade liberalization boosts global GDP and stimulates world demand for developing countries' exports. But developing and LDCs, on the other hand, seem to comply with the tough obligations such as technical barriers to trade measures, stringent SPS compliances etc. stipulated in the WTO arrangements. On the other hand, the economies of developing and LDCs like Nepal are found to be impacted from the compliance of significant tariff cut, reduction of subsidies, and other new issues like trade and environment, trade and investment, trade and competition policy, trade facilitation, transparency in government procurement, and electronic commerce.

Amidst these opportunities and challenges, it is felt high time therefore to conduct an in-depth research to analyze the costs of SPS compliance and its impacts on Nepalese exportable products which has not yet been done in the Nepalese context so far. Likewise, this study has analyzed the impact of trade liberalization on the government's revenues as it is experienced critically important since the revenues of the developing and the least developed countries like Nepal have hugely been supported by custom duties. In addition to this, the study is expected to be an important supporting document for the government in formulating domestic policies and other legal provisions. Likewise, this research may be instrumental in formulating an appropriate strategy for the development of international trade under the WTO arrangements. Organizations concerned with WTO and international trade, other stakeholders, businessman, students, and other individual researchers may also be benefited from this study.

1.7 Organization of the Study

This study is divided into eight chapters. The first chapter deals with the general background of the study, statement of the problem, objectives of the study, focus of the study, and limitations of the study. The second chapter has reviewed the literatures related to the SPS compliances of exports and revenue implications of trade liberalization. Likewise, third chapter has reviewed and formulate the methodology that are employed in this study giving especial attention to both the statistical and econometric methods. Chapter four analyzes the general introduction and an overview to economic liberalization, WTO, and the developing countries. Chapter five is focused on the implication of the WTO and trade liberalization to Nepal's international trade. Sixth chapter has analyzed the conceptual impetus and implications of the SPS measures under WTO regimes and the assessment of costs of ISO 22000 compliance for Nepalese highland orthodox tea. The seventh chapter deals with the implications of trade liberalization to Nepalese economy assessing the impact of trade liberalization on trade tax revenue employing different statistical and econometric models. Finally, chapter eight presents the summary, conclusions, and policy implications.

CHAPTER II REVIEW OF LITERATURE

Significant progress has been made over the last six decades in lowering barriers to trade, particularly the tariffs. This process had further been accelerated with the inception of trade reforms as many developing and the least developed countries liberalized their economies in recent decades. These reforms are, in fact, supported by a simple doctrine - trade liberalization increases trade flows across the economies and promote freer trade, which helps increase in consumer welfare through competitive market regime, raise government revenue through the increased volume of trade flows that keeps balance of payment favorable, and result in overall macroeconomic stability. However, this doctrine of trade liberalization has invited two serious implications for developing and the least developed countries. First, these countries have to face revenue loss due to reduced tariffs regime, which brings about an important implication as the government of these countries' revenue have hugely been supported by custom duties.

Second, however, as tariffs have declined, the importance of non-tariff barriers has increased, due to some proliferation in this area as well as wider recognition of the trade impact of existing measures. More recent efforts to regulate such measures have resulted in WTO Agreements such as SPS compliance and Technical Barriers to Trade (TBT). Such systems involve regulatory measures, policy re-orientation, and development of the necessary infrastructure, re-organization of the supply chain, enhanced capacity building and a forward looking strategy, particularly for exports, which involve costs for the exporting countries. For example, in export, the operational cost, while dealing with at micro level, of quality compliance is estimated to be between 2 to 11 percent of value of export in the case of some African countries (Shafaeddin, 2007); and the macro level costs (costs of fully implementing the Uruguay Round commitments) may be equivalent to a year's development budget of some developing countries (Finger and Schuler, 1999).

The costs to meet the SPS compliance can thus be regarded into two categories – at micro and macro level. Macro costs are defined as those expenses incurred by the public administration to conform to the demands of importing

countries, and micro costs are those expenses incurred by producers and traders for the same purpose. Macro costs that is shouldered by the government is enormous as the cost of fully implementing the Uruguay Round commitments takes away a substantial part of the capital budget of transitional and developing economies for many years (Larcher, 2005).

Likewise, the main burden of the costs reside on micro level that results from the need to comply with SPS measures. For example, relating the estimate to the production costs for some African agricultural products, compliance costs with the EurepGAP standard is 8 percent of the total accumulated farm gate costs and after post-harvest, transport, and marketing costs are added, compliance costs represent 3 percent of the total cost (Omar and Kenny, 2004).

This chapter tries to present the review of literature regarding the costs to compliance both for the export and import trade. For the export front, the costs of SPS compliance has been reviewed and for the import front, the fiscal impact of tariff liberalization (reduction of tariff resulted from the trade reforms and recently as the requirements of WTO) is appraised.

2.1 Compliance Costs to SPS

In recent years, agricultural exports to developed-country markets have emerged as a potentially major source of export growth for many developing and low income countries. Exploiting this potential, however, poses many challenges. The capacity of these countries' exporters to enter these markets depends critically on their ability to meet stringent food safety standards imposed by developed countries' market. Not only are these standards stringent, but they are increasingly so (Shafaeddin, 2007). They now go well beyond traditional quality standards, as suppliers must pay closer attention to the responsible use of agrochemicals, energy, water and wastes, as well as social and environmental impacts. These standards are significantly higher than those prevailing in developing countries, and they are also subjects to frequent changes and are difficult and costly to meet. These measures may, however, benefit the economy as they increase competitiveness and thereby trade flows in the long run, impede export trade of developing and the least developed economies because of standards are

justifiable and of great value, they may create distortions at both a national and international level.

Despite limited research works in recent years, the impact of food safety measures on the food industry and its costs, consequences (especially to developing and the least developed countries), and benefits, remain an open question to go through. There is still active debate on how food safety measures can be positioned to increase industry competitiveness on the costs and benefits of food safety systems, and on the equity impacts associated with these systems, particularly at the firm level.

At the conceptual level, an attempt to quantify the trade effects of SPS measures may begin from the analysis and estimation of the firm-specific costs of modifying a product to satisfy the requirements of a specific regulation or standard, the costs of the testing and certification procedures, the cost of the delays that may be associated with these procedures as well as the costs imposed by noncompliance with a standard which then influences consumer purchasing decisions (Henson and Heasman, 1998; Baldwin, 1999; Omar and Kenny, 2004; Larcher, 2005; Safaeddin, 2007; and UNCTAD, 2010). The cost of an SPS measure would thus include the producers' cost of compliance and the administrative and technical costs incurred by the (usually public) agencies charged with the responsibilities for the testing and certification of the established standards as well as the enforcement and monitoring of compliance by the producers.

Hence, those costs can be decomposed into two broad groups; the costs incurred at the firm-level (or micro level) and those at the macro level (Omar and Kenny, 2004; Larcher, 2005; Safaeddin, 2007). Hooker and Caswell (1999) offers an analytical framework for the quantification of the trade impact of SPS measures by focusing on differences in compliance costs that domestic and foreign firms experience in the process of meeting the requirements of such regulatory standards. In this framework, foreign firms may have to bear additional costs in the process of complying with more restrictive national-level SPS regulations of an importing country; these constitute an important component of the trade costs of the SPS measure. Again compliance costs may differ across firms due to economies of scale and location-specific cost differences. The study argues that small firms have to bear disproportionately larger costs of compliance due to lack of economies of scale

arising from in-house quality control facilities or in bulk rates from outside testing facilities (Loader and Hobbs, 1999). Empirical support for this proposition comes from Henson and Heasman (1998) which finds that unit compliance costs are negatively related to firm size (implying some economies of scale) and that large firms are generally more able to comply with regulations in a manner which yields competitive advantage than small firms.

Thilmany and Barret (1998) modified the tariff-like analysis and its standard predictions by incorporating the possibility that the SPS measure could stimulate demand in the importing country owing to the effects arising from resolving product quality and safety uncertainty problems. With this modification, the excess demand in the importing country raises leading to an increase in the equilibrium price and a greater trade volume and aggregate welfare effects than under free trade. Prices and aggregate welfare in the exporting country would also rise in this situation when the barrier-induced demand causes trade volume to be greater than free trade volume. However, if it is less, aggregate welfare and prices tends to fall. To this extent, the effects of SPS measures are said to be analytically ambiguous. The imposition of the measure can affect domestic supply of importing market in two ways. First, if domestic suppliers do not already meet the imposed standard then they would do so and thus increase production cost. This shifts the domestic supply curve to the left and excess demand curve to the right and the price and aggregate welfare of the exporting firm may rise as in the above case. This is similar to the case examined by James and Anderson (1998) whereby a disease is imported into the importing country which then causes the adoption of more disease-prevention and control spraying programs. These activities raise the cost of domestic production and reduce the domestic supply and increase the imports of the good.

Some researchers while dealing with the basic cost function of SPS compliance figure out three key components (Antle, 1999; Cao, 2005; and Doherty and Campling, 2007). Total cost is made up of a conventional fixed cost component which is independent of both output and quality; a variable cost component that combines conventional production inputs with some inputs used for achieving the specified SPS standard; as well as a second variable cost component that captures SPS compliance costs which are independent of conventional production inputs. In this

framework, cost of compliance is captured by the change in total cost of production that arises from complying with the SPS standard. Antle (1999) identifies and describes three cost estimation methods. First is the accounting approach focuses on the consequences of meeting specified regulatory standards for increases in input requirements and costs but does not involve a parametric estimation of the cost function. Second is economic-engineering method which combines detail engineering data with corresponding input cost data to construct a quantitative model of the production process. Third is the econometric method that can be used to establish a parametric cost function. It also offers a robust basis for statistically testing both structural and behavioral relationships embedded in the response of producers to the SPS regulatory regimes.

The trade effect of SPS or TBT measures in terms of costs have been modeled to consider other possible effects that may give a different set of results. One of the models is Baldwin (1999) which analyzed three other possible effects. First, the measures can raise the marginal cost or fixed. Second, it increases one-time market entry costs of exporting firms, and third is delays of foreign goods due to such measures. When a TBT (or SPS) measure is imposed the domestic price is different from the border price by the amount required to conform to the measure which are added to per unit cost of importing the product. Therefore, the effect of the measure is a rise in the domestic price and production of the goods in the importing country while domestic consumption, welfare, and import fall. In other words, a terms-oftrade gain, in addition to the Harberger-triangle gains, can be made by a liberalizing nation, which removes the SPS measures. The difference in this model's result is the expenditure to conform to the imposed SPS measure which, in the case of tariff, is the revenue earned by the tariff-imposing government. According to the model, an SPS measure of a fixed cost type may lower price in the country imposing the measure and increase the imports of foreign firms that continue to operate in the presence of the measure. This is because the market price would be lowered if foreign firms were the ones with sufficiently low marginal costs remaining to sell in the measure-imposing country. Therefore, export sales may increase for these firms as a result of reduction in price and competition that induces increased market share. This is however, a Cournot type of market framework. For competitive export firms, the imposition of SPS measure will raise the one-time entry costs similar to the imposition of a lumpsum tax which results in an increase in the per unit fixed and total cost of the export good but which leaves the average variable and marginal costs unaffected. Since changes in export supply are a function of changes in the marginal costs the entry costs induced by SPS will not affect the output and export supply in the short run. In the long run, the export firm must cover the increased average total cost of supplying the export market, thus supply will fall and price will rise in the importing country.

However, because the export firm is in pre-SPS long run equilibrium earning normal profits, and cannot influence the world price of the export good, it would not be profitable to continue to produce for the export market, and hence it exits the market. In the Baldwin (1994) model, the effects of market entry delay–inducing TBT or SPS measures are similar to those arising from temporary quantitative restriction if the delay-barrier does not have fixed cost - or variable cost-barrier component. Under this scenario, the effects are a rise in the price of the domestic good above its world price, and a fall in domestic consumption and welfare as total imports fall. When delay-barriers are combined with fixed cost-barriers, such as expensive registration and high time cost, the impact of the delay is larger. The cost of this sort of barrier is the total of operating profit that is lost and the actual fixed cost incurred. The cost of the delay also becomes larger if consumers switch between product varieties during the delay period, in which case, there are costs incurred to convince consumers to switch to the product which experienced pre-entry delay.

Though the approach cannot capture income and spillover effects in the economy (James and Anderson, 1999), it can be modified to consider market imperfections and dynamic adjustment and implemented through single equation econometric methods to provide estimates of effects. The implementation of this analytical framework can be done using the computable general equilibrium or macroeconomic modeling approach. Both implementation methods are problematic, as they require sufficient lapse of time to obtain enough time series data especially for a dynamic version of the computable general equilibrium analysis. Solving this problem by opting for a cross sectional estimation approach may suffer from product and SPS measure homogeneity. This is because many countries and firms experience different measures and export products. Thus, it may be difficult to construct a representative index of SPS measures even with country-specific study.

In some cases, the implementation of SPS compliance measures is found to be discriminatory that further increases the cost of products in export market and thus impede export from developing and low income countries. Henson and Loader (1999) assert that the SPS measures can distort trade flows in a similar manner to the technical barriers adding their impact can be usefully grouped into three categories. They prohibit trade by laying down import bans or imposing prohibitive compliance costs. They reduce overall trade flows by imposing compliance costs and/or other barriers; and they divert trade from one trading partner to another by laying down standards that discriminate between individual suppliers. In certain cases, higher food safety standards are applied to imports rather than to domestic supplies. However, even where food safety standards are neutral, they can impede trade in agricultural and food products. This potential to distort trade flows relates to two separate (although interrelated) elements of the standardization process. The first is the differences in national SPS standards, whereby quantitatively or qualitatively different standards are laid down for a particular material, product or service by individual countries. Even though a particular country may apply the same standards in a nonpartisan manner to imports as domestic supplies, the costs of compliance for importers may be greater when neutral standards become discriminatory. And the next is differences in conformity assessment procedures, whereby separate and/or different procedures are required to demonstrate compliance with SPS standards by individual countries. This necessitates the duplication of product testing results imposing additional costs on importers that have already had their product tested in their own country.

Differences in systems of conformity assessment would also influence the costs of compliance imposed on developing versus developed country's suppliers to any export market. To a large extent, these will reflect the technical capabilities and institutional structures of individual countries, but also the type and level of standards that are applied. Developed countries tend to be skeptical about the efficacy of conformity assessment systems in developing countries and rely heavily on border inspections. Although, standards that intentionally discriminate against developing countries are relatively rare, the level and nature of SPS standards and conformity assessment systems applied by developed countries may impose significant additional costs of compliance on developing country's suppliers.

Wilson (2000) presents an analysis that the standards and technical regulations restrain competition by impose stringent quality and safety regulations which increases costs. The study focused especially on the review of methodologies on the trade policy context linking empirical analysis of standards taking case examples from standards disputes in the WTO. These demonstrate a rising importance of technical barriers as a source of trade friction. The study also assesses a review of how the Asia Pacific Economic Cooperation (APEC) is addressing standards and technical barriers. It also points out that the most straightforward problem is the costs of complying with standards, which may be higher for foreign firms than for domestic firms. This is, in fact, to implicitly erect trade barriers. Compliance involves one-time costs of product re-design and building an administrative system. It also involves recurrent costs of maintaining quality control and testing and certification. Moreover, there may be indirect costs, such as reformulating the ingredients of a food product because of a requirement to list its nutrition characteristics.

Thus, a rich menu of cost-raising possibilities exists in which varying standards can raise entry barriers (higher up-front costs) or diminish the ability to compete (higher marginal costs). The problem is that exporting firms must decide whether to establish a costly platform design that may be modified slightly to accommodate particular markets, or to design a product initially solely for the home market but with costly modifications required for export. The former strategy is more common among larger enterprises, while the latter characterizes smaller firms (OECD, 1999). Thus, compliance costs can provide an advantage to large firms in global competition.

On the other hand, standard conformity system is also distortive between the developed countries' trade. Henson and Loader (2000) attempts to investigate the extent to which technical standards and conformity assessment procedures affect trade using cross country primary data. The study makes an effort to collect quantitative data on the costs of compliance with technical requirements in export markets and on the extent to which these actually impede trade. The study focuses on the costs imposed on businesses due to differences in technical standards and/or conformity assessment procedures across developed countries. The study addresses three product groups: telecommunications equipment, dairy products and automotive components.

It examines trade in these products between four study countries: the United States, the United Kingdom, Germany, and Japan. The study has, however, sought to bring out the additional costs to businesses imposed as a result of differences among countries in technical standards and/or conformity assessment procedures, trade is not found to be distorted. This study finds that different mandatory technical requirements exist between all study countries for each of the product categories and mutual recognition agreements of conformity assessment procedures have had a distinct and beneficial effect on costs of compliance. One major effect is the increased number of approval agencies that are accepted. This increases competition between agencies and has helped to reduce the costs of obtaining approval. Whilst the study has concentrated on legal requirements for products, there are, of course other legal requirements which must be satisfied by the exported product. Conformity assessment costs varied significantly between companies in all countries and across the sectors. Time is an important additional indirect cost of conformity assessment. The extent to which the additional time taken for conformity assessment affects costs is determined by the potential lifespan of products.

Oyejide, Ogunkola, and Bankole (2000) describe the impact of stringent SPS compliance on African agricultural trade. The author examines different degrees of non-trade barriers (NTBs) in three developed countries' market - the EU, Japanese and US markets. Of the three markets, the US has the least number of NTBs facing agricultural products. Japan has the highest concentration of NTBs. The EU's NTBs facing agricultural exports from Sub-Saharan Africa are also high. Second, and more importantly, the EU's NTBs lack transparency in terms of the purpose for which they were imposed. The study points out that lack of clear classification of NTBs is an issue in quantifying the impact of SPS measures on trade in general. This study also refers some studies and examples about the significance of SPS measures and their impact on Africa's export of processed agricultural food and feed products. For instance, Mwega and Muga (1998) reports that in January 1998, the EU banned the importation of fresh fish and fish products from Kenya, Uganda, Tanzania, and Mozambique ostensibly to safeguard EU consumers from the risk of cholera based on the aim that these countries lacked a credible system to safeguard the products from possible contamination. The study also refers a parallel study of Oduro and Yahya (1999) which argues that in the US market, technical standards and health

requirements enforced by the Food and Drug Administration act as a barrier to marine imports. It notes, in particular, that the automatic (though temporary, pending tests) of Ghanaian exports of fresh and frozen fish and shrimps to the US has influenced the decision of some fish exporters in Ghana not to supply that market. A third in this series of studies is of Uganda (Kasekende, Asea and Abuka, 1998) claims that Uganda's exporters, especially of food related items, frequently have particular difficulty in meeting technical regulations, product standards, and SPS measures in their main export markets. The same study refers to EU Directive which requires that fish processing establishments and factory vessels must meet specific standards of hygiene. The enforcement of these standards has had at least two effects. First, of the 38 fishing and fish processing businesses which are registered for general export, only six were approved for export to the EU market. Second, it has imposed additional cost on some exporters; one of these indicated that facilities had to be upgraded at a cost of \$5000 per vessel.

Nyangito (2002) also explains challenges for the SPS agreements that include capacity for participation in standards setting and implementation, protectionist use of the agreements by developed countries, and high compliance costs for developing countries. The challenges arising from the trade related aspects of intellectual property rights (TRIPS) agreement include counteracting the side effects arising from compulsory licenses and patent rights, use of geographical indications, and development of measures to cover traditional knowledge. The study referred to an estimation conducted by Otsuki et al (2001) of the revenue loss for African countries from implementation of low aflatoxin levels required by EU under a new stringent standard rather than the international standard set by *Codex Alimetarius* Commission (about US\$400 million for cereals, dried and preserved fruits, and nuts). The same study indicates that the trade flow of these products from Africa could increase by nearly US\$700 million if an extension of the current international Codex standard is used.

Referring the study conducted by Rudaheranwa et al: (2002), the study reveals that the compliance costs associated with implementation of the SPS agreement may be prohibitive to the Sub-Saharan countries. This is because the need to comply with new measures requires investments in new facilities and expertise, which increases the costs of production. The study refers the compliance with the HACCP EU requirements for fisheries by the East African countries in 1999-2000 forced governments to invest in new competent authorities together with equipment and technical capacity to inspect fish and implement quality control measures. These are costly investments, which most countries cannot afford. Uganda for instance, had to solicit funds from the United Nations Industrial Development Organization (UNIDO) to invest in the competent authority and associated facilities. At the firm level, enforcement of the standards required firms to invest in new facilities (fishing and processing) and in education. The processors in Kenya were forced by this requirement to start up a private fisheries organization to assist fishermen and processors meet the required standards (Nyangito et al: 2002). Another cost incurred under compliance is decline in production. Low use of pesticide in horticulture production as required by EU standards will, for example, result in low yields.

Likewise, Nyangito, Olielo, and Magwaro (2002) indicates that growing flowers using high investments that are capable of conforming to the EU minimum residual levels (MRLs) standards costs 10 times more than when traditional conventional methods are used. It has also been estimated that to upgrade a honey processing plant in Uganda to conform to ISO standards require US\$ 300 million (Rudaheranwa et al: 2002). Likewise, producing quality coffee that conforms to standards increases the costs of firms by 200 percent. The challenge with respect to compliance to the SPS agreements is for Sub-Saharan countries to set aside resources to meet the requirement of SPS agreement both at the national and firm levels. However, the agreement also creates opportunities since investments in infrastructure and technical skills improve the competitiveness of products in both the domestic and export markets.

Khan et al., (2003) also attempt to quantify and assess the firm-level impacts of complying with international standards. The study envisages three outcomes with regard to the economic and social costs and benefits: win-win, net-win, and net-loss. The study defines the win-win as a situation where cost savings realized more than offset the costs of mitigation or compliance. This can occur through increased energy efficiency and recycling inputs and costs but, combined with the environmental and health benefits; there is still a net gain. In the case of net-loss, the costs of mitigation outweigh economic, environmental, and health benefits are measured. The research brings out three possible outcomes defining a policy spectrum. The first outcome is a useful entry point for a national and/or international environmental agenda. The second outcome presents a social rationale for compliance. The third outcome justifies incentives/subsidies to industry. As in the study, health and environmental benefits are enumerated (environmental gains are quantified selectively), reflecting the methodological difficulties of quantification. The assessment is based on a microlevel analysis. The case study tries to focus more on the environmental costs caused by increased trade volumes a consequence of acceding to the global markets within the WTO arrangements and lacks in quantifying the policy and legislative costs of compliance.

Lacovone (2004) analyzes the SPS measures and their impact on the trade of some Latin American countries using general equilibrium models. The study assesses that technical regulations and standards, which are emerged as the recent generation of traditional trade barriers results in genuine protection and elements of disguised protectionism that are strictly interconnected and very difficult to disentangle. The study analyzes that regulations to ensure health and safety of food can have both a protective impact (i.e. benefiting consumers or producers at risk from externalities carried by certain imports) and also a protectionist one which benefit producers but hurt consumers by restricting competition and raising prices. The study examines a further complication when a regulatory barrier is introduced with the declared aim of addressing a health and safety risk, and where different countries make different assessments of the nature of the risk or have different degrees of risk tolerance. This multifaceted and subtle nature of SPS measures make the justification of their existence clear, but also open the possibility of political capture and disruptive impact on trade. The study asserts that a binary discrimination between genuine protective and protectionist measures is not possible because the difference is more a qualitative one and a matter of grade. The issue is complicated by the fact that some measures may not be intended as trade barriers but may have that effect. The WTO has devised a very complex system of rules for deciding when a country has the right to take actions that may disrupt trade in the name of public health or safety. To avoid these decisions being determined by pure political bargaining an alternative procedural rationality, which involves a legal process, has to be developed.

The state of the art for quantifying the impact of SPS measures in the specific analysis of the impact of different aflatoxins standard on the European imports of nuts from Latin-American countries, the study has quantified the trade costs. Many questions remain open including how to approach the trade-off between appropriate levels of risk to human health and costs of differing levels of protection set in standards to international trade (Otsuki et al., 2001). The study assesses that the new harmonized European standard is reducing health risk by approximately 1.4 deaths per billion a year, but the negative effect on the sole African exports of cereals, fruits, vegetables and nuts would be of US\$ 670 million compared with the international standard set by Codex. The study estimates that the impact on the Latin-American exports of nuts to Europe might exceed US\$ 100 million.

Estimating the compliance cost in developing countries seems difficult due to the lack of comprehensive data and information. This may be the existence of small scale firm size with traditional production technology including in both packaging and labeling and firm's unorganized account keeping system. However, some estimates are found, which can help understand the tentative compliance cost. Omar and Kenny (2004) attempt to measure the quality compliance cost of Moroccan agricultural products that are exported in the European markets using primary data with case studies. The study asserts that the Moroccan farmers have the most difficulty in complying with the issues related to pesticides. Some pesticides are not available in the Moroccan market, and substitutes may not be allowable in the country of destination. Pesticide restrictions and the allowable MRLs vary among importing countries. Moreover, the national system for pesticide registration is slow in registering new pesticides. For some products, the combination of MRL regulations and Moroccan pesticide regulations impede trade, preventing both producers and traders from entering certain promising export markets. The study, using a microanalysis approach for a medium-sized tomato farm of 10 ha (ha), the cost to implement the EurepGAP standard is found to be US\$51,000 for set-up (buildings and equipment). In addition, annually recurring costs include training, monitoring and surveillance, and certification; and total approximately US\$20,000. Relating this estimate to the production costs, compliance costs with the EurepGAP standard is 8 percent of the total accumulated farm gate costs. After post-harvest, transport, and marketing costs are added, compliance costs represent 3 percent of the total costs.

Large farms have the necessary financial resources and can usually complete the facilities within six or seven months (a maximum of one year). The same task would probably take smaller farms two to three years. For citrus growers, the additional requirement of mobile sanitation and hygiene facilities would result in higher compliance costs. In the case of compliance with multiple standards, the costs are higher, affirming an observation made by a number of interviewed farmers and packing house managers that differences among standards are, by far, the most serious problem of all.

The short-term burden of the quality compliance thus falls heavily on the primary producer; however, they would be the gainer in the long run. A crucial question here is how resource-poor smallholder producers can remain competitive and thereby have a long-term stake in the worldwide market. Market has proved that these stringent quality compliances for competitiveness are in general more easily met by the large-scale commercial farming sector. Harris et al (2001), however, find it possible as many different reasons put forward as to why smallholder groups could still remain competitive. Some commodities, for example coffee, are largely grown by smallholder farmers and there is considerable scope to expand organic production among coffee growers' co-operatives and producer groups. Finally, organizations with a developmental approach to international trading, such as Third World Network Trading, Oxfam and other Fair Trade companies, aim specifically to link marginalized and poorer farmers to international markets, at the same time as ensuring their efficiency and competitiveness.

Another important aspect of the compliance cost that developing economies have, most often, to bear is the cost resulting from the delay in exports, or the rejection of the product at the port of the importing country, due to the lack of compliance. The compliance with SPS measures for those countries, therefore, is not only difficult but it is also highly costly, in relation to their export earnings, and per capita income level; even when judged on the basis of the underestimated cost. It would be also shown that as their capacity for the compliance is limited, such difficulties and cost would result in slow export expansion in the absence of the compliance. Example is the EU's 1997 ban on India's exports of fish and fishery products. The stringent compliance measures not only impacted the exports but also the Indian overall competitiveness had been influenced by the costs and other impacts more generally of implementing enhanced food hygiene and other food safety controls, which again involves additional costs. On the other hand, there are various other factors that have influenced the competition that Indian exporters have faced from other countries, notably China, Thailand, and Vietnam.

The study estimates the various methods used to infer the value individuals place on risk of death show that the different methods produce a wide range of values of a statistical life from less than US\$1 million to tens of millions of dollars (Crutchfield et al., 2000; Antle, 1999). It is clear that the problem of how to weight up costs and benefits of the new aflatoxin standard, and the SPSMs in general, is still a very open and debatable question. Therefore, in a situation where one cannot weigh up the costs and benefits of the outcome of the regulatory decision, if regulators can prove they have fulfilled these procedural requirements, having undergone a process of genuine evaluation of the health and safety benefits, then this may be acceptable even if the trade costs are very high.

Henson, Mohammed, and Rajasena (2005) assess the loss from the rejection of export of India's fish and fishery products due to microbial contamination and quality problems that caused a muddy-moldy smell at the ports of EU countries. From 2001–2003, India has to face restrictions on exports to the EU, such as restrictions related to residues of antibiotics. These restrictions resulted in a decline in India's exports to Japan through 2002 to 2004. Thus, Indian exports of fish and fishery exports declined from US\$221 million in 1996–97 to US\$114 million in 1997–98. Exports of shrimp, in particular, declined from US\$137 million in 1996–97 to US\$54 million in 1997–98. Likewise, exports of fish and fishery products from Kerala declined from US\$96 million in 1996–97 to US\$51 million in 1997–98.

Palasuberniam, Leng, and Ismail (2005) assess the cost and impact of quality measures when exporting fruits and vegetables while taking the Malaysian case studies. Certain countries insist on having vapor heat treatment plant to treat fruits before being considered for export. But commissioning such a facility needs capital expenditure of approximately US \$ 1 million to just operate. This is an enormous investment for a farmer in a developing or the least developed country. When farmers struggle both physically and financially to comply with the new requirements, trade is

temporarily disrupted and the country suffers income losses. Lack of infrastructure and technological advancement also affect the compliance of SPS measures. It is also a real challenge for developing countries to prove the validity of an equivalent treatment that is cheap and effective. The study reveals that some countries, meanwhile, impose very stringent phytosanitary measures that are non-science- based, discriminatory, and non-transparent.

The study argues that with the increasing demand for compliance to SPS, trading is becoming costlier and each step requires detailed studies that inevitably involve cost and time referring to an example that at the beginning of year 2004, the export of Sarawak timber worth RM 7.5 million was hindered due to imposition of new quarantine regulations by an importing country. This research estimates the Malaysia's revenue from timber-related industries at MR 17.5 billion annually would be affected by such quality compliance. This study further focuses on the fact that, with the implementation of the SPS agreement, some countries had amended their laws bring them in line with the SPS requirements. These new laws are either enforced immediately or the changes in the regulation are very drastic. This puts them in a difficult position because the whole production system of the farmers' field or exporters in the country has to be revamped. This reference may be very much relevant to the Nepalese case in terms of policy, legislative, and legal compliance.

Manarungsan et al., (2005) also attempt to measure the costs of compliance with SPS standards taking Thailand's case studies of shrimp, fresh asparagus, and frozen green soybeans using primary data with case studies. The study has analyzed that the impact of tightening the sanitary measures on chemical drug residues in shrimp has resulted in three major developments at the farm level: the recognition and popularization of probiotic farming, the farming of disease-resistant vannamei shrimp, and the emergence of more laboratories providing diagnostic test services. The study estimates that the use of alternative chemicals increases costs by 5.7 percent from the conventional chemical supplemented shrimp farming method, but by shifting to probiotic farming, farmers decreased their production costs by 33 percent. The study estimates the costs to the exporters/shrimp processors of compliance with the zero tolerance ban is approximately US\$328/ton for shrimp. This figure is based on estimated laboratory analysis expenses of US\$1,804,525, given 5,510 tons of shrimp

exports to the EU. Roughly, the cost of compliance is approximately 1.6 percent of the total shrimp export value to EU of US\$111 million. Likewise, the study also estimates cost to the government sector to test and monitor chloramphenicol and nitrofurans amounts to US\$4,301,790 (the cost of the analytical equipment).

Regarding the SPS compliance cost of asparagus, farmers are found to increase their initial production costs by 165 percent and lowered their yield by 20 percent. However, their produce is found to have commanded a price that is 29 percent higher than the price of its conventional pesticide-treated counterpart. For the exporters, the bulk of the increase in the costs of compliance is due to the cost of the private laboratory analysis. Roughly, the cost of compliance with exporters is 100 percent higher than the compliance cost prior to the tightening of the pesticide requirement. Laboratory analysis accounts for 63 percent and the implementation of quality systems 37 percent of this cost. For the frozen green soybean, the cost of pesticide compliance with farmers is found to have increased their production costs by approximately 10 percent from US\$1,114 to US\$1,200 per ha/year. The increase in costs was primarily due to use of better-quality but costlier chemicals and organic fertilizers for mixing with chemical fertilizers, which have been found to induce better quality pods and yield.

Larcher (2005) attempts to measure the cost of SPS compliance of the agrifood (tropical fruits) focusing on three African countries (Tanzania, Mozambique and Guinea) using cross country primary data and case studies. This study intends to identify and quantify the compliance costs for tropical fruits faced by them. It presents a framework that facilitates estimation of costs of compliance for exporters that are associated with agricultural safety standards and SPS. The study tries to measure the compliance cost in two categories – at micro and macro level. Macro costs are defined as those expenses incurred by the public administration to conform to the demands of importing countries, and micro costs are those expenses incurred by producers and traders for the same purpose.

The study based on the survey of primary data, estimates varying costs of compliance both at macro and micro level in all the three countries. The study reveals that Tanzania has the lowest macro cost of compliance as it figures US\$ 2.52 million as compared with Guinea US\$ 5.936 million and Mozambique US\$ 9.250 million.

Likewise, Tanzania has the lowest micro (firm level) cost of compliance to its products with respect to ErepGAP standard that involves US\$ 98,690 set up cost and US\$ 20,500 ongoing cost for a unit compared with Mozambique US\$ 109,400 set up cost and US\$ 23600 ongoing cost. Guinea has the highest micro costs to its product i.e. US\$ 2,197,200 set up cost and US\$ 27,000 ongoing cost.

Cao (2005) examines the implementation of the SPS measures in the New Zealand through the HACCP analysis and the costs associated with it. The research applies quality adjusted trans log cost function to estimate the change in variable cost of production due to HACCP as a modeling technique to quantify the costs and benefits of HACCP risk management program implementation. The study assesses the elasticity of cost with respect to safety is found to be 0.75 for New Zealand meat processing plants. Based on this safety elasticity estimate, the increase in variable cost of production for a firm under study due to HACCP is estimated to be in the range of \$NZ37-\$NZ337 million. This is equivalent to an increase from 1.7 percent to 21 percent of total variable cost, or from five cents to 48 cents of unit cost, depending on the level of food safety practices of the plant before HACCP. In the HACCP implementation cost categories, it falls into the operating cost group which is associated with costs incurred due to the slowdown of the production process for the monitoring, sampling and testing tasks. The study analyzes also the impact of HACCP on meat industry export performance applying the Global Trade Analysis Project (GTAP) model. The meat industry was chosen as a case study as it is one of the first industries that had to comply with the first deadline of the implementation (July 2003). Also, being a significant export-oriented industry of New Zealand, the meat industry provides an ideal case for the purpose of this study. The research shows that this program can bring a positive impact on exports. However, the magnitude of the impact depends on the status of existing food safety management before HACCP implementation. The GTAP model simulates different scenarios where market accesses to significant export destinations are lost when HACCP is not adopted. The estimated costs of these losses signal the potential benefits of HACCP risk management program. The research results show that HACCP can deliver a net benefit to the New Zealand meat industry. The study also explores the interaction between food safety management and international competitiveness through an

economic analysis of the impacts of the program on a New Zealand food processing industry.

Gebrehiwet Y. et al. (2007) have also tried to measure the impacts of quality compliance measures on trade using gravity model. They assess the stringent SPS standards set by developed countries have limited the access to the markets of developed countries. Many developing countries have, as a result, experienced adverse repercussions on their economies as a result of the failure to comply with the SPS standards. This has resulted in a considerable loss of export revenue, employment, and income. The research reveals the impact of SPS standards on the exports of developing countries demonstrated by the border rejection rate of exports from developing countries. The detention rate of commodities due to various standard requirements from June 1996 to June 1997 is found quite significant which indicates that the main reasons for the high detention rate for Africa, Latin America, Caribbean and Asia are filth, microbiological contamination, and decomposition. The failure to comply with these relatively less costly safety standards like food hygiene, by developing countries is an indication that compliance with standards that require more sophisticated techniques, which are very costly like maximum pesticide residual limits and heavy metals, would be tremendously challenging. The total cost of rejection at the importing countries' border for the developing countries' exporters also includes the loss of product value, transport costs and other related costs.

Doherty and Campling (2007) conducted a comparative analysis of SPS issues and the costs associated in canned tuna production based on the field level data in Mauritius, the Seychelles and Thailand. The study showed that although hygiene requirements varied significantly, in extreme cases plants had to be extended and/or the entire layout needed to be changed. Across the plants involved, costs of compliance ranged from US\$51,400 to US\$514,300, with an unweighted and weighted mean of US\$302,600 and US\$265,492 respectively (the mean is weighted according to the volume of production of each processing plant. The weighted mean is lower because a number of smaller plants had relatively high costs of compliance). As a proportion of annual turnover these costs ranged from 2.5percent to 22.5percent with an unweighted and weighted mean of 9.3percent and 7.6percent respectively (the mean is weighted according to the volume of production of each processing plant).

The installation of integrated pre-processing facilities was considered to be the most significant cost of compliance. Processing plants also had to implement significant changes to their operational procedures. These plants were required to establish the necessary plans, control procedures and documentation systems. In addition, cleaning, maintenance and pest control procedures had to be enhanced. In many cases extensive programs of worker training had to be undertaken. The cost of implementing these new procedures in many cases included laboratory analysis, record keeping, ongoing staff training and maintenance of worker medical records. To undertake these tasks, new technical and supervisory staff had to be employed and better qualified (and more expensive) personnel were needed. On the non recurring cost front, the study assesses that the compliance with EU hygiene standards for fish and fish products can be USD 13,540,092 each plant. This amounts to approximately 1.7 percent of the value of annual exports prior to the initial implementation of the remedial investments. In addition, the costs of pre-processing had then to be internalized within each preprocessing plant. These costs are significantly greater than purchasing ready preprocessed raw material from independent facilities. In this study, the resultant increase in production costs ranged from 5 percent to 15 percent with a weighted mean and unweighted mean of 11.7 percent and 10.3 percent respectively.

Shafaeddin (2007) examines a significantly high cost of compliance with SPS measures for poor countries with reference to Africa based on some African agricultural firms. The study shows that the burden of cost of compliance is entirely on the exporters despite the fact that their capacity for the compliance is limited. The study further indicates that the literatures often disregard the cost of loss of exports, or rejection of products at the border of an importing country, let alone the cost of reorganization of the supply chain; the existing organization of supply chain in poor countries would result in the lack of export expansion. This study, articulates the main characteristics of the SPS Agreement and the related measures applied by main importing countries, which are complex, difficult and high cost SPS system. The study asserts that the preparation for the compliance is also difficult for the poor countries as it is knowledge intensive, requires a learning period, training and a close cooperation between the public and private sector in various stages of the supply chain. The research reveals that the operational cost, alone, of compliance is estimated to be between 2 to 11 percent of value of export in the case of Africa; in each case it

depends, however, on the type of product, the destination of exports, the capacity of the country for the compliance and the size of farm holdings and exporting enterprises and the organization of the supply chain. Further, the investment cost can be colossal; in some cases (e.g. Mozambique) exceeding the total food exports of the country. The available studies provide estimates for the administrative cost of control, inspection, testing and certification at the border; but disregard more important costs such as the costs of delays in exportation or rejection at the port of importing countries. Yet the socio-economic cost of the lack of compliance is enormous. Thus they downplay the need for taking preventive measures and the related cost of reorganization of the supply chain.

Ragasa (2008) makes an assessment to measures the costs and competitiveness in international seafood markets using a case study approach and institutional analysis. The study reveals that a majority of the processing firms in the Philippine have incurred net losses from stringent food safety measure i. e., Hazard Analysis and Critical Control Point (HACCP) implemented by the EU. Procuring quality and safe raw materials and difficulties in controlling flow of materials from input production to processing and distribution are additional disincentives and costs faced by processing firms. Despite these losses by many processing firms, the entire fisheries industry stands to benefit from EU HACCP adoption (and would lose about US\$ 4-6 million in the event of EU HACCP non-adoption by some firms). This gain or loss is associated with maintaining or losing EU market access. Due to difficulties in shifting factors of production to other productive sectors, traders, and other input suppliers are found to lose their net profits (or net value added) associated with the loss of EU market by processing firms.

The research explores the food safety dimension of the Philippine seafood industry focusing basically on the costs and competitiveness by Logit model and firm level financial cost-benefit analyses using primary data from 59 seafood processing firms in the Philippines. The study finds that the output prices did not increase and are not expected to increase in the near future due to HACCP adoption along with the reduction in product wastage, and other realized benefits from HACCP adoption were limited as the output increases. Applying Translog Cost Function to analyze two period panel data from 59 firms, the study shows that the reported HACCP expenditures are underestimated, likely due to investment crowding-out effect, lower flexibility in production, or costs hidden in other accounts when calculating production costs. the study also found that the there is no evidence of cost efficiency gains with HACCP systems; and there are no economies of size in seafood processing even with HACCP systems, contrary to most findings in the literature.

UNCTAD (2010) estimates SPS compliance costs to implement quality management and assurance schemes for coconut and coconut by-products, taro cocoa, copra, fish (fresh, frozen, smoked and canned), palm oil, kernel, beef, and timber to demonstrate compliance with both public (mandatory) and private (commercial voluntary) standards for three Pacific Island countries; Samoa, Solomon Island, and Vanuatu. The analytical framework of the study is anchored on four pillars; inventory, impact assessment, policy analysis, and strategies of technical assistance supported by the survey and country case studies to measure the micro and macro cost of SPS compliance cost. Micro compliance costs, in this study are meant to comply with by producers, exporters and other intermediaries engaged in agrifood supply chains at the farm and firm-level when adhering to food safety and quality demands imposed at borders. While public standards and regulations have, in general, become more stringent, private or voluntary commercial standards, on the other hand, have not only increased in number and use, but also become more demanding on suppliers from developing countries. The bars are continuously being raised by big distributors on suppliers. More often than not, commercial standards are not only more binding than national and international legislation and regulatory requirements, but go beyond the framework of food safety compliance.

The study takes British Retailers Consortium (BRC) as the benchmark to estimate and assess the micro-level costs of compliance in the focus PICs. The micro-level SPS costs for Samoa and Solomon Island and Vanuatu are grouped into two categories; establishment (or setup) costs, and recurrent (or ongoing) costs. In order to revamp their recurrent activities, in particular, internal controls over procurement and product safety, Samoa and Solomon Islands need an injection of \$25,000 and \$78,500, respectively. Establishment costs, on the other hand, are estimated at \$38,800 for Samoa, and \$81,500 for Solomon Islands. The aggregate micro compliance costs for both countries is around \$224,000, with Solomon Islands

accounting for 71.4 per cent (or \$160,000) and Samoa with 28.6 per cent (or \$64,000). Micro-level compliance cost estimates for Vanuatu, particularly with respect to organic and Fair Trade certification were incomplete. Of the few organizations and farmers that had achieved internationally recognized 'Fair Trade' and organic certification, estimation of compliance costs were confined to the direct costs of setting up appropriate quality assurance and food safety management systems.

Likewise, in macro level costs, which include costs of legislation development, training, infrastructure and equipment upgrading, inspection and testing, and other monitoring and control mechanisms is estimated about US\$5.4 million. The magnitude or level of the macro costs implicates the level and status of the public sector in addressing SPS compliance and agrifood safety and quality standards in each country. The higher the macro costs, the lower the preparedness of the country to address SPS and food safety standards. Using this analogy, of the total \$5.4 million, Solomon Islands needs about \$3.6 million (or 67 per cent) to revamp its internal controls over procurement and product safety employed in the public sector. This is followed by Samoa needing \$927,000 (or 17 per cent) and Vanuatu \$860,000 (16 per cent).

Looking a bit differently, Henson, Loader, Swinbank, Bredahl, and Lux (n.d.) conducted a research study on ten developing countries' case studies and a survey of SPS contact/enquiry points in all low- and middle-income countries that are members of the WTO and/or Codex Alimentarius. The research explores a major problem faced by developing countries access to the resources required to comply with SPS standards in developed countries: information on SPS standards themselves, scientific and technical expertise, appropriate technologies, skilled labor, general finance, etc. If these resources are not available locally, they have to be obtained overseas, significantly increasing the costs of compliance. For small and medium-sized companies these costs are likely to be prohibitive. The period allowed for compliance with developed country SPS standards is an important factor influencing compliance costs. In many cases, developing countries require longer compliance, due, in part, to the limited access to compliance resources. If suppliers do not comply within the specified period they may be prevented from exporting. In the short term, the costs in

terms of the lost revenue can be significant. They may also lose customers and/or market share that can affect their long-term export performance.

The application of product regulations and standards is becoming increasingly contentious as an implicit non-tariff barrier to trade. Maskus et al. (n.d.) refers to the non-tariff barriers are of particular concern to developing countries, which may bear additional costs in meeting such mandatory standards. Many developing countries express rising frustration with regulations that vary across their export markets, require duplicative conformity procedures, and seem to change capriciously in order to exclude imports. Some developed countries are adopting Mutual Recognition Agreement (MRA) that may lower costs for their trading firms but could result in greater discrimination against countries that do not belong to them. Substantial evidence suggests that compliance costs with regulations can be high in relation to the value of products, which could deter entry into export markets altogether.

Likewise, Deodhar (n.d.) analyze the costs of and motivation for food safety and quality compliance to the Indian food processing firms using factor analysis, contingency tables and chi-square tests. The study finds out that the quality and production related factors motivate firms to employ HACCP but the trade associations are not at all instrumental in promoting the system. Regarding the costs of quality compliance, the set-up cost and operating cost vary with the type of food sub-sector and the size of firm. The study estimated annualized HACCP costs, which is arrived at by adding the operating cost and the annualised set-up cost. Based on the depreciation charges of plant and machinery recorded in the annual reports of food processing firms. The research has taken 10 percent proxy set-up cost for annualised set-up cost component. Further, to make comparisons based on scale of operations, the study divided the firms into 5 categories on the basis of their turnovers. On comparing the HACCP expenses across these categories, it was found that the annualised total HACCP cost per Rs. 1 crore of turnover declined as the turnover increased. The expenditure was Rs. 82,130 for firms with turnover of Rs. 5 crore or less and it declined to Rs. 34,380 for companies with turnover between Rs. 6-10 crores. The cost declined continuously to reach Rs. 2,380 for the firms with a turnover of Rs. 100 crores or more. These estimates indicated that the HACCP cost burden for the smaller firms was much higher than that for the larger firms. This relative cost differential could have a significant impact on small firms who might be operating on a narrow profit margin. Since the overall food industry is made up of a large number of small firms, the HACCP cost could be a major deterrent for implementation of HACCP for Indian food processing firms.

2.2 **Revenue Impact of Trade Liberalization**

Tariff revenue concerns have emerged as an important issue in the framework of multilateral trade negotiations under the Doha Development Agenda (DDA). The July framework agreement explicitly identified the tariff revenue issue as a challenge for countries dependent on revenues from import tariffs and instructed the Negotiating Group on Non-agricultural Market Access (NAMA) to take into account the particular needs that may arise for the members concerned.

After successive Uruguay Round negotiations and the creation of the WTO, many developing countries chose to dismantle their trade barriers and open their economies to international competition. As liberalization of the economies was instrumental in lowering import tariffs and removing import restrictions, the developing countries are in dire straits for fiscal adjustment and maintaining favorable balance of payment, which is crucial for the macroeconomic stability.

More importantly, this regime of tariff reduction involves substantial short-run costs for developing governments, especially in terms of a decline in tax revenues. Many developing countries rely heavily on trade tax revenue, and a reduction or elimination of these taxes may be a source of their fiscal instability. To the extent that public spending is targeted at useful programs (e.g., schools, infrastructure, health), the transition to free trade initially may result in a significant loss for a poor nation. In the long run, if liberalization is successful, these problems would be expected to be addressed both by provision of better private markets and rising revenues from different sources (income and sales taxes or possibly trade taxes owing to the volume effect) as a result of rising national income levels.

Quantifying the fiscal impact of tariff reduction has been drawing the interest of policy makers and researchers along with inception of trade liberalization initiatives especially of developing and less developed countries. The analysis was crucial as these countries have been facing revenue shortfall coupled with welfare loss effects against the backdrop of trade liberalization. It is widely acknowledged that there are substantial gains from trade that result from participation in a free trade area, but when fiscal revenue is accounted for, it is not clear what the net welfare effect would be. The estimation of the cost or the impact of tariff reduction (especially of imports), however, is constrained by the lack of comprehensive data in the developing countries, some studies have made possible by applying import elasticity model, welfare model, Harberger-Johnson triangles, Almost Ideal Demand System (AIDS) model, and so forth.

Branson et al. (1992) has emphasized the importance of concomitant fiscal adjustment to make trade reform sustainable. The study describe that the fiscal impact of a tariff reduction depends directly on the size of the tariff cut, the response of imports to the tax change, and the relative importance of import tariffs as a source of government revenue. It also depends indirectly on what happens to the other tax bases and how they in turn will affect revenue. The key to revenue performance, therefore, is how all the tax bases would change with reform. To estimate the direct and indirect fiscal consequences, the study has provided general-equilibrium tax models. These tax models can be quite complicated and difficult to build, particularly in view of the data constraints in many developing countries. Their complexity also makes it hard to sort out relative importance of various factors. To seek an easier but still rigorous alternative, to better understand how tax models work, and to identify what affects public revenue, this study takes a simple analytical representation of a large class of empirical general- equilibrium models; a prototypical framework that has been shown to anticipate many of the significant results of trade focused general equilibrium models.

Worrell (1993) describes that the fiscal impact of a tariff reduction depends upon a number of factors such as the size of the tariff reduction, the response of imports to the tax change, the relative importance of import tariffs as a source of government revenue, the response of the other tax bases to the tariff reduction and how those tax bases will impact on total revenue, the number of tariff line items that are above and below the maximum revenue tariff, the level of initial tariff, and the share of those imports subject to high tariffs in total imports. The study explains that the countries with heavier dependence on trade taxes as a source of fiscal revenue would be more severely affected, but what is also of critical importance is the response of exporters and importers in Caribbean Community to the reduction in tariffs. It is important because, the level of imports and exports and overall economic activity affects the revenue that governments collect.

Bevan (1995) analyzes the relationship between trade liberalization and the budget deficit using multivariate regression model. It discusses the ways in which this relationship depends on the specifics of a country's economic structure, its fiscal structure, and the trade regime that is being liberalized. Liberalization involves major shifts in the main relative prices in an economy, including those of nontradables, wages, importables, and exportables. The budgetary effect of these shifts depends on how government revenues and expenditures are distributed across these categories and the extent to which these revenues and expenditures are sensitive to price changes.

The study sets out to relate some popular approaches to assess this issue (such as analysis of the foreign exchange budget) to a more comprehensive approach using an applied general equilibrium model. The argument is illustrated using data from the most recent of a sequence of abortive, planned liberalizations in Kenya, as well as a number of stylized illustrations. The study concludes not only that liberalization may have a positive impact on the budget, but also that, in certain circumstances, the effect may be strong. Kenya's economic and fiscal structure and its recent trade regime appear to conform to these circumstances. This offers an interesting perspective on, and possible explanation of, the recent involuntary liberalization in that country, which was triggered by a substantial reduction in aid inflows, but which appears to have led to an appreciation, rather than depreciation, of the exchange rate. Another implication of the paper is that countries may have difficulty planning a conservative approach to trade reform that is designed to avoid fiscal deterioration without exacerbating the resource misallocations that the reforms are designed to ameliorate.

Yap (1997) assesses that a reduction in the tariff level would lead to an unambiguous decline in the GDP growth rate using a three-gap model as it generally results in a reduction of the surplus of the government's primary account. Empirical results using Philippine data show that this condition is satisfied. Since foreign direct investment (FDI) is crucial in breaking the economic gridlock brought about by capital inflows, policymakers should determine whether greater macroeconomic instability that results from larger fiscal and trade deficits can be offset by the more liberalized economic environment in attracting FDI. It may also be the case, however, that greater macroeconomic instability eventually countervails any benefits from microeconomic reform

Abed (1998) asserts that the tax liberalization and tax reform for Southern Mediterranean Region (SMR) are, however, likely to become increasingly important over the long run, the more immediate fiscal costs/revenue losses due to tariff reductions are of concern to several SMR countries. Losses from tariff cuts are particularly relevant for countries whose imports from the EU account for a large share of total imports, for example, imports from the EU amount to about 60.70 percent of the total in the North African countries. The study reveals that in the absence of offsetting measures, estimates of the revenue losses range from about 9 percent to as high as 35 percent of total tax receipts equivalent to a range of 1 percent to 4 percent of GDP. Lebanon, Algeria, and, to a lesser extent, Morocco and Tunisia would be among the most adversely affected.

This paper also reviews comparative data on tax revenue shares over time and suggests that countries that implemented such tax reforms generally succeeded in gradually reducing their reliance on the taxation of international trade.

Bhagwati, Greenaway, and Panagariya (1998) have stated that loss of tariff revenues from inter participant trade can exceed the net gains usually identified in the Harberger-Johnson triangles thus resulting in an overall welfare loss. In this context fiscal loss and adjustment, therefore takes on added significance in the short run. The net welfare effect involves a comparison of the trade creating gains with the trade creating losses an analysis associated with Viner (1950). To determine the scope for trade creation and trade diversion ex ante, a comparison of the production cost structure of the potential Free Trade Area participants and also the rest of the world must be made for particular products.

Almost Ideal Demand System (AIDS) is another model to measure the impact of tariff reduction. Nicholls, Shelton, Janice, and Colthrust (1999) examine using the AIDS model to measure the impact of tariff removal from the Caribbean Forum - EU Regional Economic Partnership Agreement on revenues. Their results indicate that for the Organization of Eastern Caribbean States (OECS), Jamaica, and Trinidad and Tobago, tariff removal under a FTA would result in a decline of revenues from trade taxes. The study outlines some of the weaknesses of the Vinerian theoretical apparatus. Among them the whole issue of distribution of trade gains. Distribution is of special concern to small vulnerable Caribbean Community states since as mentioned before, particular distributions could result in overall net welfare losses for particular countries in a Free Trade Area because of the significance and magnitude of fiscal losses. The fiscal impact of a tariff reduction depends upon a number of factors such as the size of the tariff reduction, the response of imports to the tax change, the relative importance of import tariffs as a source of government revenue, the response of the other tax bases to the tariff reduction and how those tax bases would impact on total revenue, the number of tariff line items that are above and below the maximum revenue tariff, the level of initial tariff, and the share of those imports subject to high tariffs in total imports. The estimated revenue loss due reduction in import tariff tell a story because in Jamaica and Trinidad and Tobago, revenues from trade taxes were projected to decline by 3.4 and 2.36 per cent respectively. The OECS revenues on the other hand would decline by 8.4 per cent. This outcome obviously is a direct function of dependence on trade taxes, since the OECS is highly dependent. In the OECS as whole tax collected on international trade represented 57.4 per cent of tax revenue in 1999 and 26.3 per cent of the value of imports. Consumption tax was the main source of tax revenue (28.3 per cent of tax revenue), followed by tariffs (17.8 per cent) and customs service charges (7.3 per cent). Currently the OECS Member States are working on reform of the tax system with a view to introduce a value added tax.

Devarajan, Go, and Li (1999) estimate the fiscal impact of trade reform through a general equilibrium tax model. The model explains both the direction and the magnitude of the fiscal consequences of trade reform that depend on the elasticities of substitution and transformation between foreign and domestic goods. This is one of the most comprehensive empirical estimates of those elasticities, which explains the implications to tariff reduction to the public revenue generation. The model describes that the values of the two elasticities are relative to each other. If only one of the elasticities is low (close to zero), revenue would drop unequivocally as a result of tariff reform, reaching close to the maximum drop whether or not the other elasticity is high. For imports to grow and tariff collection to compensate for the tax cut, the import elasticity has to be high. Because of the balance of trade constraint, however, imports cannot substitute for domestic goods unless supply is able to switch toward exports. Hence, the export transformation elasticity has to be high as well. As substitution possibilities between foreign and domestic goods increase, a tariff reform can theoretically be self-financing. But if the elasticities are less than large, tax revenue would fall with tariff reduction and further fiscal adjustments would be necessary. The model provides empirical estimates of the possible range of values for the elasticities of about 60 countries, using various approaches.

The study asserts that despite compelling evidence of its many benefits, trade liberalization remains an unfinished business in many parts of the world, particularly Sub-Saharan Africa. One reason is that many developing countries today are still dependent on import tariffs for revenue. Governments fear trade reform will lead to significant revenue losses in the short run. In sub Saharan Africa trade taxes account for 27 percent of total revenue of governments. For some countries – Côte d'Ivoire, the Gambia, Madagascar, Mali, Mauritius, Niger, São Tomé, and Principe, and Swaziland, for example the dependence on trade taxes is higher than 40 percent.

OECD (2004) analyses of the impact of trade liberalization on 24 developing economies and reaches the conclusion that countries with higher and more dispersed tariff barriers, while being well positioned to benefit from a tariff reform, are also more vulnerable to revenue loss. Depending on the initial levels of tariffs and binding overhangs, the trade, welfare and revenue impact of tariff reductions the study finds that it differs considerably; while countries with higher initial tariffs and a lower binding overhang record a larger revenue loss, their welfare gains derived from trade creation are likely more substantial. Simulations of tariff cuts based on a Swiss formula with a coefficient of 10 point to a strong negative correlation between the trade and the revenue effects, i.e., the countries affected the most by revenue loss also experience the most significant trade creation.

Agbeyegbe and Mariam (2004) and Ebrill et al., (1999) explain that the revenue impact of trade liberalization for a sample of selected developing and emerging market economies. The studies argue that revenue tends to be least affected if the initial position of the trade regime is highly restrictive and if liberalization is accompanied by reforms in customs and tax administration, also with the aim to
broaden the tax base. The revenue impact is reduced if measures involve the tariffication of quantitative restrictions; the auctioning of licenses; a reduction in tariff dispersion; and the elimination of exemptions. Likewise, Fisman and Wei (2004) analyze the relationship between tariff rates and evasion based on export data from Hong Kong and import data from China, finding a fall in tariff evasion of 3 percent for each percentage point of reduction in the average tariff rate.

African Trade Policy Center (2004) describes that trade liberalization as a source of fiscal instability for African countries because of their high dependence on trade taxes for public revenue. The study, supported by case studies, reveals in Africa as a whole, international trade taxes generated on average 28.2 percent of total current revenues over the last decade; and for sub-Saharan Africa the share goes up to 30.5 percent. This compares to 0.8 percent for high-income OECD countries, 18.42 percent for lower medium-income countries, and 22.5 percent for low income countries. This is critical for African countries because they have already carried out considerable liberalization of their trade regimes. Negative fiscal impacts emerge at later stages of liberalization: the boost to revenues from higher trade volumes as a result of tariff cuts is insufficient to outweigh the revenue-damping effect of the tax reductions.

However, the study asserts at the same time that the revenue-side of the budget of those countries is not worsening systematically. The average annual change in the total tax revenue to GDP ratio is positive for many countries. Although a few countries experienced both decreasing revenues and increasing deficits, for most of those whose budget balance deteriorated, revenues is found to be growing. The study asserts that some countries improved the budget balance in the face of falling revenues. The 1990s saw moderate progress on trade liberalization because of unilateral trade reforms and bilateral, regional, and multilateral trade agreements. The average index of trade restrictions, which captures the average level of tariffs, decreased slightly from 9.8 percent in 1985 to just over nine percent in 1990, and then dropped to around seven percent in 2002. The effect of liberalization on trade volumes was small, with African trade growing from 65.8 percent of aggregate GDP in 1985 to 77 percent in 2002. The study, however asserts that trade reform packages may include elements that have a positive or neutral effect on revenues such as the conversion of quotas into tariffs. Positive fiscal effects can arise from the elimination of trade-related subsidies and tariff exemptions. Reducing tariff dispersion around a relatively constant average rate can also have a positive revenue impact to the extent that goods subject to higher tariffs are characterized by a high price elasticity of demand. On the other hand, the volume of imports tends to expand when tariffs are reduced and hence the tax base would grow.

IMF (2005) also assesses the impact of tariff liberalization on governments' revenues of both the low and middle income countries. It reveals that trade tax revenue typically constitutes between one-quarter and one-third of total tax revenue in low- and middle-income countries, and only a negligible share in high income countries. The study has extensively used cross country panel data and analyzed with the help of case studies. It asserts that trade liberalization has been associated with a marked decline in trade tax revenue relative to GDP, in both developing and developed countries, and in all regions over the past 25 years. The reduction is quite marked: amongst middle-income countries, for instance, trade tax revenues as a share of GDP fell by about one-third. This development is closely linked to an overall trend towards trade liberalization - proxied, for example, by a decline in collected import tariff rates - in all regions and income groups, particularly between the mid 1980s and the mid 1990s. The collected tariff rate has almost halved in all three income groups since the mid-1980s, with the largest absolute decline in the low income group. Collected tariff rates also fell in all geographic regions over this period, with the sharpest absolute declines in Asia and Sub-Saharan Africa. The study points out that some poorer countries have been unable to recover lost trade tax revenues through strengthened domestic taxation. Amongst low-income countries, total tax revenues as a percent of GDP have on average declined in parallel with trade tax revenues. Middle income countries, on the other hand, have managed to maintain total tax revenues broadly unchanged, while in high income countries they have increased. Looking across the regions, experience is mixed: on average there has been less than full replacement of lost trade tax revenues in the Middle East, whereas there has been more than full offsetting over the 1990s in both Sub-Saharan Africa and Latin America.

However, on the other hand, the study asserts that trade liberalization does not necessarily reduce revenue from trade taxes, in which case; of course, no issue of identifying alternative revenue sources arises. This is most likely to be the case when liberalization involves: reducing non-tariff barriers, by converting them to explicit tariffs and by addressing ineffective or corrupt customs administration; reducing distorting exemptions, or raising low tariffs to establish a more uniform structure; cutting tariffs that are initially set, for protective reasons, at such high levels that a reduction would cause trade volumes to increase by more than enough to offset the direct revenue loss from lower rates; and reducing most favored nation tariff rates towards preferential rates, tending to shift import demand towards more heavily tariffed items.

Kowalski (2005) examines the impact on developing countries' government revenue, trade flows and welfare following the changes in their bound tariffs; and reviews the theoretical literature and past experiences with tax replacement policies. The study assesses the methodological issues associated with estimating revenue impacts referring impact estimates for a sample of developing countries; linking the differences in impacts to cross-country differences in existing tariff regimes as well as properties of formulas for tariff cuts taking into account the efficient tax replacement policies. In this study, the author applies different methodological approaches that can be used to evaluate welfare and revenue impacts of tariff reduction and, focusing on the Swiss tariff reduction formula, applies them to a sample of 24 developing countries. Based on the simulation results, the paper offers a discussion of crosscountry differences and provides sensitivity analysis by changing the Swiss formula coefficient. The study also offers a discussion of tax reform policies that could accompany tariff reform including a discussion of past experiences with trade-related fiscal adjustment. The paper also provides a simulation of the welfare effects of reducing tariffs and simultaneously replacing lost tariff revenues with revenues from consumption tax.

Baunsgaard and Keen (2005) assess a study on the background of significant trade liberalization in recent years notwithstanding, many developing and emerging market economies continue to rely heavily on trade taxes as a source of government revenue including the South Asian countries. The study is supported by general equilibrium model. The study refers to the fact that trade taxes still account for an average of about one-quarter of all Sub-Saharan government revenues. In the developing countries of Asia and the Pacific, they account for around 15 percent. A significant concern for many countries as they contemplate further liberalization whether in the context of proliferating regional agreements, bilateral agreements with the European Union or other developed countries, or in relation to prospective multilateral tariff reduction under the Doha round - is thus the potential impact on tax revenues. These concerns are emerging ever more clearly as a potentially significant obstacle to further trade liberalization. The study refers that in the early stages of liberalization, the revenue consequences of reform may be relatively minor. Indeed the first steps of trade policy reform—often involving the reduction of prohibitively high tariffs, tariffication of quotas, elimination of exemptions, and raising of low tariff rates in moving towards a more uniform tariff-may plausibly lead to an increase in trade tax revenues. There must come a point, however, at which further movement towards freer trade reduces trade tax revenues. But, the well-known relative administrative ease of collecting customs duties may mean that replacement from other sources requires significant reform of wider tax practices. Much of the revenue from a value-added tax (VAT), for instance, is collected at the border (often half or more, in many developing countries). Further trade liberalization in many developing countries may be hindered unless they are able to find alternative sources of revenue.

On the other hand, taking evidence over the last 25 years, the high income countries are being successful in managing to offset reductions in trade tax revenues by increasing their domestic tax revenues. For middle-income countries, there is also evidence of significant recovery: there are strong signs that this has been in the order of 45–60 cents of additional domestic tax revenue for each dollar of trade tax revenue, with apparently full recovery when separately identifying the episodes in which trade tax revenues fell. For low-income countries, however, recovery has been far from complete. At best, they have on average recovered no more than around 30 cents of each lost dollar. Since many of these countries also face an intense need to enhance revenue to provide sustainable finance for poverty relief and development, and may also face revenue pressures from other sources, the auspices for the prospect and impact of further trade liberalization are troubling.

Khattry (2006) describe that trade tax revenue as a percent of GDP in Cambodia due to trade liberalization is declined monotonically from the peak of 4 percent in 1994 with tariffication, to 2.5 percent in 2005, the same as in 1993 pre reform (the reported figures in Cambodia exclude the VAT and pre-VAT levies on imports). The analysis of bivariate correlations split into two periods, 1994-98 (posttariffication and pre-VAT) and 1999-03, shows a statistically significant negative correlation in both periods between trade tax revenue as a percent of GDP, and openness (whether measured inversely by the effective tariff rate, or directly by the ratio of trade value to GDP). Thus, the Cambodian case calls for compensating revenue. The study shows that retention of the consumption tax on imports with tariffication in 1994 enabled the 5.1 percent of GDP attained for tax revenue that year to be held right through the subsequent slide in customs revenue. A second jump in tax revenue to 7.1 percent in 1999 comes with VAT replacement of the consumption tax on imports, enabling capture of revenue from value addition further downstream. By 2005, tax revenue is found to have risen further to 8.4 percent. The replacement of lost trade tax revenue in Cambodia is very efficiently sequenced, with compensating revenue from the VAT secured prior to tariff binding in 2004, as a part of the WTO accession process. Since half of all imports into Cambodia, presently as also in 1994, are exempted from import duties, the revenue from trade is not encouraging.

Bhattacharya et Al. (2006) also assess that trade tariff reductions in Bangladesh has resulted in reduction of trade tax revenue, but this is offset by an increase in domestic indirect and direct tax revenues. The study supported by multivariate regression econometrics reveals that overall revenue has rose from 6 percent of GDP averaged over 1980-84, to 9.4 percent over 2000-04. It shows that the tax revenue component is 7.4 percent, and 5 percent respectively, in the two pre and the post-liberalization periods. Of this, the trade tax component (inclusive of the VAT levied on imports) fell only very marginally, from 4.06 to 3.95 percent. A more correct total, excluding the VAT on imports, would have shown a sharper decline. Bangladesh thus affords an example of a least developed country that has managed to compensate for declining trade tax revenue during a process of trade tariff reduction, contrary to the general finding for low income countries in general in Baunsgaard and Keen, 2005.

Khanal (2006) assess the fiscal revenue implication in Nepalese economy covering the thirty years from 1975 to 2005. Although some trade reform began with

a World Bank Structural Adjustment Program implemented in 1986, the author see a sharp discontinuity in trade policy in 1990, when the average tariff rate was cut drastically with an IMF enhanced structural adjustment facilities. There was also a political restoration of democracy with elections in 1990. Accordingly, the paper compares the post-reform period 1990-2005, to the fifteen years 1975-90 prior to trade tariff cuts. The initial cut in the average tariff in 1990 was followed by rationalization of dispersion of tariffs, and subsequently by other legal and institutional reforms. The effective tariff rate is found to have risen steeply during the pre-reform period from 10 percent in 1975 to 19.9 percent in 1990, and after which it fell again to 9.5 percent in 2005. Thus, the present-day level is not substantially lower than it was in 1975 prior to trade reform, where the level today at 9 percent is well below the pre-reform rate. The Nepal example underlines again the scope for increasing revenues with the non-tariff dimensions of trade reform. The impact of all these on the openness of the Nepal economy is evident from the rise in trade as a percent of GDP, from 17 percent to 23.6 percent, even when the effective tariff rate was rising, and further to 37.8 percent, when the effective tariff rate fell.

Rajaraman (2007) has also analyzed the revenue impact of trade tariff cuts using cross country specific case studies, in which the study found prima facie that the impact is found to be negative, unless accompanied by a more than compensating volume increase (elastic import demand). However, the revenues need not necessarily fall with trade tariff cuts, especially if the starting point is highly tariff-protected, yielding high percentage increases in import volume starting from a low base, in response to small percentage reductions in the tariff. Or high import protection might have engendered a flourishing tax-evaded smuggled flow of goods, so that reduced tariffs may transfer import traffic from the smuggled to the tariff-bearing channel because of the reduced gain from avoiding taxation to offset the risk, even if border vigilance remains unchanged. Further, if the earlier trade protection regime was qualified with a large number of end-user exemptions, which is normally the political economy outcome in such regimes, a process of reducing the nominal tariff rate with elimination of exemptions could actually result in a rise in the effective tariff rate. Tariff rationalization and reduction of tariff dispersion might actually raise the tariff rate on previously untaxed imports, such as food or industrial inputs. And, if trade

reform involves tariffication of non-tariff barriers, there could be a huge increase in revenue.

On this background, therefore, when trade reform is more broadly cast in this manner, fiscal revenues tends to be enhanced by the tariffication components, whenever these take place, and is threatened during the phase when trade tariffs are lowered. If these take place simultaneously, the net effect tends to be a function of which effect dominates. But the fiscal impact of trade reform is not confined to revenues alone. The larger package of measures normally included within the category of trade reform, such as adherence to TRIPS protection and other WTO mandates, could carry an expenditure-side impact. Although the least developed countries are exempted from implementation of the TRIPS agreement until 30 June 2013, by the terms of a WTO decision taken in November 2005, there would be some impact due to changes in legislation in countries like India, Thailand, Brazil and China, which are the major sources of import of cheap pharmaceutical and chemical products. The revenue impact individually, whether in conjunction with expenditure side impacts or not, could carry negative consequences from the very perspectives of efficiency and growth that drive trade tariff reform.

Jones and Morrissey (2008) analyze the effect of tariff reductions, as part of trade liberalization, on the volume of imports, and in particular adverse effects on domestic import-competing sectors. With the reference of many African countries, which reduced tariffs significantly during 1980s and those countries which did not alter tariffs, the study analyzes the effects of tariff reductions on the change in imports using Difference-in-Differences model to evaluate the impact at the general and sector specific level. While comparing the effects on imports for tariff-reducing countries relative to non-liberalizing countries, controlling for the timing of tariff reductions, trends in import capacity (country effects) and in sector imports across countries (product market effects), the study has found little evidence (except for Ethiopia) that suggests imports increased for the countries with trade liberalization relative to those of non liberalized countries.

Younas and Bandyopadhyay (2009) describe the developing and the least developed countries' governments' dependence on trade tax revenue. Although trade liberalization results in greater economic efficiency and growth, it is also a potential source of fiscal instability in developing countries because they rely heavily on revenue from trade taxes. It may again affect government spending on development activities - at least in the short run. Potential revenue shortfalls can undermine macroeconomic stabilization and development programs and may cause a reversal of the trade reform itself. This study using multivariate regression model, investigates whether donors use aid to compensate recipient nations for lost trade revenue or perhaps to reward them for moving toward freer trade regimes. The authors do not find empirical evidence supporting such motives. This is of some concern because binding government revenue constraints may hinder development prospects of some poorer nations. However, the main objective of trade liberalization is to enhance allocative efficiency (and hence welfare), and not to preserve government revenue. This paper does not argue for a revenue-neutral tariff reform. Reducing tariffs brings welfare gains, net of any losses in tariff revenues and these gains are the ultimate motivation for tariff reform.

Hallaert (2009) analyzes on the elimination of the customs duties of African, Caribbean, Pacific countries on imports from a large trade partner as the EU that has jeopardized both fiscal and macroeconomic stability of some countries. A sharp fall in fiscal revenues could also reduce the government abilities to meet the very large developmental and social needs of these countries. The study assessing the dynamic effect of the tariff cuts under the Economic Partnership Agreement among some African countries through the application of Computable General Equilibrium (CGE) model, analyzes that the customs duties revenue losses vary significantly across countries. For the four countries considered in this study, they range from 8 to 21 percent. This is relatively small even when it is taken into account that taxes on international trade make up about half of government revenues in Madagascar, 19 percent in Burundi, 13 percent in Rwanda, and 10 percent in Tanzania. Madagascar would be the worst affected because it is the country where revenue losses from customs duties are the largest and the country whose budget is the most dependent on taxes on international trade. But, even in this case, the loss is limited to 3 percent of total revenue at the end of the 15-year-long transition period. The study reinforces that revenue losses depend crucially on two factors: the depth of the tariff cut and the share of the EU in the countries total imports. Madagascar cut more its tariffs than Eastern African Community (EAC) countries - Burundi, Rwanda, and Tanzania. As a

result, Madagascar will lose 71 percent of its revenue from customs duties on (EU) imports compared to 52 to 58 percent for the EAC countries. Since the EU share in the country's total imports is also relatively high at 29 percent, this translates into a drop of 21 percent of its total revenue from customs duties on imports (excluding a few oil products with specific duties). In 2007, customs duties accounted for 11 percent of the Malagasy government's fiscal revenues. Thus, a 21 percent drop in customs duty revenue only reduces total revenue by about 2.5 percent. Taking into account that customs duties are part of the base for VAT on imports, there is an additional loss of about 0.5 percent of revenues at the end of the transition period. Rwanda and Burundi would both lose slightly more than half of their revenue from customs duties on EU goods. But, because the EU has a larger share in Burundi imports than in Rwanda's imports the loss in total revenue from customs duties is twice as large reaching 16 percent. In contrast, despite losing more revenues from duties on EU imports than Rwanda or Burundi, Tanzania's total loss in revenue from customs duties will be relatively limited at 8 percent because the EU accounts only for 17 percent of its imports.

In revenue loss respect, Rwanda and Burundi would first reduce their Most Favored Nations tariff to align their schedule to the EAC Common External Tariff (EAC CET) then cut their tariff on EU imports. Although the revenue loss of import duties on EU imports is similar for Rwanda and Burundi at the end of the transition period, the impact is larger for Burundi. Moreover, the impact of moving to the EAC CET has more revenue implications for Rwanda than the EPA. For Burundi, in contrast, the EPA has a larger impact. This difference is due to the already mentioned larger share of EU imports in Burundi than in Rwanda.

In principle, even in the short run, revenue losses from trade liberalization may be offset by turning to less-distortionary alternative sources of revenue. This approach requires good governance and an efficient domestic tax system; however, the evidence for this alternative is somewhat disheartening. For example, Khattry and Rao (2002) find that in low-income countries revenue constraints remain even after a decade of trade reforms, and they emphasize the need for a fiscally realistic development strategy in the post-liberalization period. In a broader analysis of the limitations of trade policy reform in developing countries, Rodrik (1992) argues that tariff reduction at the cost of fiscal considerations can have disastrous consequences citing the examples of Turkey and Morocco, where trade taxes were reimposed because of fiscal problems.

However, neo-classicists argue that the coordinated tax-tariff reforms in developing countries favor a decrease in tariffs to enhance efficiency with an increase in domestic taxation in order to maintain enough revenue to finance public goods, Baunsgaard and Keen (2010) found that, for many low income countries, this revenue substitution is difficult since they recovered, at best, no more than about 30 cents of each lost dollar. These countries are really in need of increased domestic tax revenues (direct taxes - taxes on income and profit - and domestic indirect taxes - value added/sales taxes and excises) since the 66 countries in the sample collected in the study, on average over the period 1990-2005, about 10 percent of GDP from domestic taxation compared with the figure of 27 percent of GDP for OECD countries. But Burgess and Stern (1993) highlighted that the constraints on raising revenue through personal income taxation in developing countries are many and include problems of income measurement, administrative capability and poor accounting. These differences in tax revenue collection can also partly be explained by the existence of a larger shadow economy in developing and transition economies compared to OECD countries (Schneider and Enste, 2000).

While across the board import substitution and prolonged protection, the philosophy the liberalists argue, have led to inefficiency and failure, the experience of developing countries in implementing the trade liberalizing hypothesis during recent decades is also found to be disappointing. Shafaeddin (2011) points out the results of cross-sectional studies undertaken by various scholars that have revealed little or no evidence with no statistically significant correlation between trade openness and economic growth in recent decades. Rather the results of the study on the experience of developing countries in trade liberalization are found to be mixed, depending on the stage of industrialization of the country which undertakes liberalization on the way it has been done. The study has taken a sample of 50 developing countries for the period of 1980-2000 and repeated the analysis for the period 2000-04 in order to examine the possible impact of the lag between liberalization and economic performance as well as the degree of revenue vulnerability of the countries, the study

shows that 20 countries experienced rapid expansion of exports of manufactured goods and hence increased trade tax revenues. By contrast, the performance of the remaining countries, mostly in Africa and Latin America (majority cases), was not satisfactory. These countries embarked, in the main, on the process of structural reform in the 1980s, including uniform, across-the-board and often premature trade liberalization. Consequently, half of the sample countries, mostly the low-income ones, have faced de-industrialization along with negative trade revenue impact. As UNDP (2003) finds a positive correlation between a county's tariff rate and growth rate for the 1990s, there is also some evidence that trade liberalization has led to de-industrialization of low-income countries, particularly in Sub-Saharan Africa (Cage and Gadenne 2011)

Cage and Gadenne (2011) provide evidences on the adverse fiscal consequences of opening up to trade on tax revenues. Using a novel dataset covering 103 developing countries between 1945 and 2006 this study identifies 110 episodes of decrease in tariff revenues and shows that on average the fall of trade taxes is of nearly 4 GDP points. Only 55% of the countries are found to recover the lost revenue through other tax resources 10 years after the shock. The study finds some evidence that, as predicted by the model, more inclusive political institutions and a more taxfriendly economic environment lead to a higher probability of revenue recovery. However, the study does not argue that trade liberalization is bad per se in the long run, a fall in tariffs can have a positive impact on welfare as it increases the efficiency of the tax system, the model points out that this effect is found to be always negative for countries which are trapped in a low tax capacity equilibrium, and the data suggests that nearly a third of countries which experience a fall in trade tax revenues never recover the lost revenues through other means in the sample under study. Other countries are also found to have suffered from a short run loss, but found to be better off in the long run. Interestingly the theoretical framework developed in this study suggests that the gains from trade liberalization can be obtained from investing in tax capacity. Building more efficient tax administrations in developing countries is found to have led them to open up to trade as they would no longer need to levy tariffs to raise revenue, though other protectionist motives for raising tariffs may be at play. The study abstracts throughout from the potential impact of trade openness on the

economic activity in order to focus on its fiscal impact, overlooked in the existing literature.

However, some studies do assert that trade liberalization does not necessarily reduce revenue from trade taxes if prudentially matched by identifying alternative revenue sources (IMF, 2005) although, in the early stages of liberalization, the revenue consequences of reform may be relatively minor (Baunsgaard and Keen, 2005). This is most likely to be the case when liberalization involves reducing nontariff barriers, by converting them into explicit tariffs; reducing distorting exemptions, or raising low tariffs to establish a more uniform structure; cutting tariffs that are initially set, for protective reasons, at such high levels that a reduction would cause trade volumes to increase by more than enough to offset the direct revenue loss from lower rates; and reducing most favored nation tariff rates toward preferential rates, tending to shift import demand toward more heavily tariffed items (IMF, 2005). Trade revenues, however, may not fall with trade tariff cuts, especially if the starting point is highly tariff-protected, yielding high percentage increases in import volume starting from a low base, in response to small percentage reductions in the tariff. High import protection might have engendered a flourishing tax-evaded smuggled flow of goods, so that reduced tariffs may transfer import traffic from the smuggled to the tariffbearing channel because of the reduced gain from avoiding taxation to offset the risk, even if border vigilance remains unchanged (Ebrill, Stotsky, and Gropp, 1999; Agbeyegbe and Mariam, 2004; and Rajaraman, 2006). Indeed, the first steps of trade policy reform – often involving the reduction of prohibitively high tariffs, tariffication of quotas, elimination of exemptions, and raising of low tariff rates in moving toward a more uniform tariff - may plausibly lead to an increase in trade tax revenues (Baunsgaard and Keen, 2005).

For some, the main objective of trade liberalization is to enhance allocative efficiency (and hence welfare), and not to preserve government revenue (Younas and Bandyopadhyay, 2009). The reduction in tariffs can also lead to higher import volumes, as a result of both income and substitution effects; demand could shift to items with higher tariff rates as a result of an income effect; a depreciation of the exchange rate following trade liberalization could raise the value of imports and tariff revenues in local currency; and over the longer term, revenue could be expected to increase as a result of higher economic growth (Woytek, Hallaert, Lankes, Sadikov, Azim, and Smith, 2006). Thus the policy should focus on the importance of the tariff cut, the response of imports to the tax change, and the relative importance of

import tariffs as a source of government revenue (Branson et al., 1992; and Worrell, 1993).

2.3 Research Gap

It is generally agreed that, developing and the least developed countries in the WTO framework have to bear the dual costs of compliances – one is emerged from the conformity assessment of the stringent quality compliance of exportable products on the export front, and the next is revenue consequence of reduced tariff regime on the import front. The main focus of this study, in this regard, is to assess the impact of WTO policy regime in economic liberalization framework on developing and the least developed countries' trade and revenues. While, the concerns are converged into the comprehensive assessment of such impacts, the literature and empirical evidence are seemed to be scant.

This study has, therefore, attempted to analyze the holistic impact of WTO regime on both sides of the revenues spurred by the international trade. As there are very little studies regarding the cost of SPS quality compliance and its impact on export trade, this study has assessed the costs of quality compliance of Nepalese highland orthodox tea in the export sector among agricultural products as the export potential appears highest for tea all in terms of employment generation, revenue collection, and socioeconomic sustenance. Since, the tea processing industry is seen as a potential growth industry and an important channel for reducing poverty due to strong linkages with the rural communities and also serving as an illustration of the issues facing commercial and estate farming, there are hardly any studies regarding the competitiveness, conformity compliance, and implications of the international trade on this industry. Another reason behind the study on the cost of compliance is that this study for the first time in Nepalese exportable products has applied a systematic analytical procedure on the SPS quality compliance generating a database of agri-products in conformity with the SPS impact analysis.

Another important addition of this study is a formulation of SPS component matrix which has not been identified for the study of SPS quality compliance for Nepalese exportable products, so far. However, there are few studies regarding the SPS conformity assessment and their complexities in international trading activities. At the same time, this study is presented, perhaps in the most plausible analytical framework; i.e., a combination of all accounting, engineering, and econometric methods that Antle (1999) suggested.

Likewise, on the import front, there are few studies, so far, regarding the comparative analysis of the revenue consequence of tariff liberalization with respect to the pre-liberalization reference. This study has, in fact, attempted to fill this gap by comparing Nepal's trade tax revenues in two different periods; i.e., pre and the post-liberalization regimes. Another important analytical aspect of this study remains in the processing of the data through recent econometric models as they have tested the unit root properties of the time series through Dickey Fuller, Augmented Dickey Fuller, and Philip Perron procedure and analyzed in Error Correction Modelling of co-integration methods by using Philips-Hensen Fully Modified Ordinary Least Squares (PHFMOLS) approach. Revenue impact caused by the trade liberalization is also checked by using the Chow Test for checking parameter stability. This research can be the first of its kind in Nepali literature regarding the estimation of revenue variation due to trade liberalization combined with using other variables such as per capita real GDP, population, VAT etc.

CHAPTER III

RESEARCH METHODOLOGY

When liberalization has been emerged as a functioning framework in the economy, it has very often attributed some far reaching implications especially for the economies of developing and least developed countries in two crucially important external economic domains (in international trade), i. e., in exports and in imports. However, the contemporary history of international trade witnesses a marked progress in lowering barriers to trade, particularly the tariffs over the last five decades, the practice of non-tariff barriers (NTBs) has widely been adopted. And the recent efforts to regulate these measures have resulted in the WTO Agreements in TBTs and SPS regulations. With the world-wide reduction in tariffs under the auspices of the GATT/WTO standards and, more generally, non-tariff measures (NTMs) have further gained importance in world trade. This trend also reflects the growing concerns over product quality and consumer health and safety. As this quality compliances of exportable commodities, within the SPS framework, involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength.

On the other hand, these countries also have to face revenue loss from import due to reduced tariffs regime, because of the agreements in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries governments' revenue are hugely supported by custom duties. Therefore, a country has to bear the dual costs of compliance – both in export and in import – to be benefitted from the WTO and economic liberalization.

This study; in such an economic setting, has tried to measure the costs of quality compliance with special reference to Nepalese Orthodox Tea among exportable commodities within the SPS framework. The reason why it is selected is that Nepalese Orthodox Tea is considered one of the most potential exportable products in terms of quality, revenue, employment, and socioeconomic impact, having a good comparative advantage. Likewise; Nepal, like many other developing and the least developed countries, has undergone to tariff liberalization regime which is a subset of economic liberalization in early nineties of the last century. This study has also tried to measure the trade revenue impact on the Nepalese economy.

For the estimation and analysis of quality compliance costs of Nepalese tea as per SPS structure, as well as the revenue impact on the economy because of tariff liberalization and recently in WTO regime, this chapter has provided separate methodology considering the nature and sources of data and the applicability of the models that explain the best.

3.1 Methodology to Measure the SPS Compliance Cost of Export

The analysis of costs that could be attributed to quality systems in SPS compliance is complex. Major difficulties include the allocation and the quantification of cost items. Costs may not only include elements that could be directly attributed to the implementation and operation of quality systems (direct costs), but also elements where the relationship is not exclusive (indirect costs). Furthermore, costs could involve monetary elements that could be quantified and nonmonetary elements that are difficult to quantify (qualitative elements). The difficulties are, first, to find quantifiable indicators for qualitative elements and, secondly, to integrate all elements into a unified, if possible monetary, measurement.

For the analysis of costs in product quality and safety improvements, the elements of costs attributed could be categorized as real-source compliance costs, social welfare losses, and transitional social costs (Unnevehr & Jensen, 2001). Real-source compliance costs refer to costs incurred by firms which must change their production to meet new standards. Examples involve the purchase of new equipment, the operation and maintenance of new equipment and the use of additional quality inputs, such as skilled labor. Likewise, social welfare losses include higher consumer prices for food products or additional legal and administrative expenditures, such as higher premiums for insurances against product recalls. The transitional social costs refer to costs that might occur in a transition period as, for example, the costs associated with the closure of firms that could not meet new standards.

This chapter primarily uses quantitative research to answer the research questions, combined with qualitative analysis to strengthen the findings and

recommendations. This section discusses the data used in the estimation and methods of collection; categories of ISO 22000 costs and the estimation models used to analyze the research questions.

3.1.1 Theoretical Framework for the Estimation of Costs

Referring to the estimation of costs, Antle (1999) suggests three alternative approaches that, under proper assumption, can be used; accounting; engineering methods; and econometric modeling. The accounting approach simply implies the identification and assessment of capital and labor actually used to implement and manage the system, without the specification of a cost function. The main advantage of this methodology is its simplicity, due to the nature of required data, usually easily found at the plant level. Several examples of application of accounting approach to the estimation of costs of compliance to different norms and regulations have been recently proposed, namely with reference to HACCP (Zugarramurdi et al., 2000; Cato and Dos Santos, 2000; Colatore and Caswell, 2000), ISO 9002 (Canavari and Spadoni, 2003) and traceability (Mora e Menozzi, 1999).

However, the accounting approach presents a major constraint in extending sample results to the universe due to the large variability of plant typologies and does not allow the assessment of the effects on the overall efficiency of the firm. The engineering and econometric approaches can partially overcome these difficulties. The engineering approach uses optimization models based on available technical and economic data via the estimation of cost functions for food safety characteristics of produced goods (Jensen and Unnevehr, 2000). The econometric approach uses existing databases to estimate cost function through proper econometric techniques (Antle, 2000). The economic engineering approach allows for efficiency analysis, but shares with the accounting approach the poor level of external validity. The econometric approach is characterised by a trade-off between production process specification and the theoretical consistency of estimated models (Antle, 1999)

Antle (1999) showed that production cost can be divided into three components: a variable cost component which depends both on output and product quality, a separate variable cost component which depends on quality but is independent of output, and a fixed cost component. Hence, if we characterized the

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quality-differentiated product by the triplet (y,s,q), where y is output quantity, s is product safety, and q is a vector of other non-safety quality attributes, then the cost function for a production process with quality control can be specified as:

$$C(y,s,q,w,k) = vc(y,s,q,w,k) + qc(s,q,w,k) + fc(k) \dots (3.1.1)$$

where, w is a vector of input prices; k is the value of capital stock; vc(.) is the variable cost component that depends on both product quantity y and product quality s, q; qc(.) is the other variable cost component that is independent of y but depends on s and q; and fc(k) is the conventional fixed cost component

The classical cost function usually does not account for product quality. The reason is that quality is normally treated as fixed in the short run. Additionally, many quality attributes are not readily observed and measured (Gertler and Waldman, 1992). Antle (2000), following Gertler and Waldman (1992), developed a model with an unobserved scalar safety variable whose parameter can be estimated using other observable variables. To derive a measure for that unobserved safety variable, Antle (2000) utilized a model of a market in which price-taking firms produce a quality-differentiated product.

3.1.1.1 Quality-Adjusted Translog Cost Function

Recalling that the theoretical variable cost component, which depends on both product quality (s, q) and quantity y, is defined as VC = f(y,s,q,w,k). Here, q is a vector of other non-safety quality attributes. Management intensity (q_{max}), which is defined as the ratio of non-production labor to production labor, is used as a non-safety quality variable. The other quality variable (q_{mix}), which measures the proportion of processed product in total output, as used by Antle (2000), is not considered in this study due to the unavailability of data. Hence, defining the input variable as consisting of labor (L) and other materials (M), the empirical variable cost function [i.e. $VC = f(M, L, y, k, s, q_{max}, t)$] is specified as:

$$\begin{aligned} \ln VC &= \alpha_0 + \alpha_M + \ln w_M + \frac{1}{2} \alpha_{MM} (\ln w_M)^2 + \alpha_L \ln w_L + \frac{1}{2} \alpha_{LL} (\ln w_L)^2 + \beta_y \ln y \\ &+ \frac{1}{2} \beta_{yy} (\ln y)^2 + \delta_k \ln k + \frac{1}{2} \delta_{kk} (\ln k)^2 + \alpha_{ML} \ln w_M \ln w_L + \beta_{yM} \ln y \ln w_M \\ &+ \beta_{yL} \ln y \ln w_L + \beta_{yk} \ln y \ln k + \delta_{kM} \ln k \ln w_M + \delta_{kL} \ln k \ln w_L + \gamma_s \ln s \\ &+ \gamma_{sM} \ln s \ln w_M + \gamma_{sL} \ln s \ln w_L + \gamma_{sy} \ln s \ln y + \gamma_{sk} \ln s \ln k + \theta_{man} \ln q_{man} \\ &+ \beta_{Mt} \ln w_m t + \beta_{Lt} \ln w_L t + \beta_{yt} (\ln y) t + \beta_{kt} (\ln k) t + \beta_{st} (\ln s) t \\ &+ \beta_{mant} (\ln q_{man}) t + \beta_t t + \beta_{tt} t^2 \end{aligned}$$

$$(3.1.2)$$

Where, k is the value of capital stock at the beginning of the year and t is a time variable which captures change in technology over time.

Following Antle (2000), the second-order term of safety $(lns)^2$ and the second order terms of other quality variables are omitted in order to reduce the number of parameters and the potential collinearity caused by the large number of variable interactions in the unrestricted model.

Applying Shephard's lemma, the first-order condition for labor input is:

$$C_{L} = \alpha_{L} + \alpha_{LL} \ln w_{L} + \alpha_{ML} \ln w_{M} + \beta_{yL} \ln y + \delta_{kL} \ln k + \gamma_{sL} \ln s + \beta_{Lt} t \qquad (3.1.3)$$

Where C_{L} is the labor cost share.

The conditions for linear homogeneity of the cost function are: $\alpha_M + \alpha_L = 1, \beta_{yM} + \beta_{yL} = 0, \gamma_{sM} + \gamma_{sL} = 0, \delta_{kM} + \delta_{kL} = 0, \beta_{Mt} + \beta_{Lt} = 0, \alpha_{MM} = \alpha_{LL} = -\alpha_{LM} = -\alpha_{ML}$(3.1.4)

The theoretical safety function (2) is written in log-linear form as: $\ln s = \tau_0 + \tau_{man} \ln q_{man} + \tau_p \ln p + \tau_z \ln z + \tau_M \ln w_M + \tau_L \ln w_L + \tau_k \ln k_{man}$(3.1.5) Where, q_{man} is the management intensity, which is the ratio of non-production labor

to production labor, p is output price, k is capital stock at the beginning of the year, $w_{M'}w_L$ are prices of materials and labor respectively, and Z is demand variable.

There are two restrictions with the quality equation. First, $\tau_0 = 0$ as the intercept in this case cannot be identified. Second, $\tau_p = 1$ as derivative with respect to p is positive and the units of safety cannot be defined. However, this function requires a sizable time series data along with a wide range of computable variables, estimation

quality costs and the variable relationships in cross section data cannot me modeled, and thus needs to switch on to other appropriate model.

3.1.2 Data and Sources

Face-to-face interviews based on a semi-structured questionnaire were used to collect data. Several consultations with experts, firm owners, and technical managers were made to ensure the reliability and robustness of the data. Instead of mail surveys, which have been used in similar studies, face-to-face interviews were undertaken with the plant (technical) manager and/or finance personnel of tea processing firms. This method made the data collection process more personal and further helped in gaining trust, confidence, and cooperation from the respondents. A number of production site tours made by the researcher also reinforced the interactive nature of the data collection and provided better mutual understanding of ISO 22000 systems and accounting of costs between the researcher and the responding firm representatives.

In cases where respondents were not able to provide estimates on costs, the respondents were instead requested to provide their best estimates in terms of percentages or ranges (either of total costs or total value of production) and that are verified through focus group discussion. An extensive and careful process of designing and pre-testing the questionnaire within the industry was undertaken to elicit relevant and meaningful responses. The objective was to design a questionnaire that was easy to comprehend and answer, with minimum difficulties for the respondents. The questionnaire was about 11 pages in length and the face-to-face interviews lasted approximately two to three hours.

3.1.3 Population and Sample of the Study

There are 23 highland Tea Estates with the production capacity of over 30 thousand kilogram processed tea in a year and they all the firms are the member of Himalayan Orthodox Tea Producers Association (HOTPA). Among them, 18 Tea Estates with their processing plants have been taken as census sample to measure quality compliance costs according to the SPS framework which are mandatory in the international trade, especially, in the WTO regime. The reason why the study has included them is that they all are export oriented units and affected by food safety

SPS regulations. Five Tea Estates have been excluded in the research as they have not yet started to prune and planned for the processing unit according to ISO22000 compliance. The researcher has selected all highland Tea Estates which produce orthodox, green, black and other organic and flavored tea and has not taken those tea estates which produce CTC range.

3.1.4 Focus Group Discussion

The primary source of information for this study has been derived from the producers and exporter of orthodox tea involved in the international trading activities. The information from the Focused Group Discussion (FGD) is crucial in contextualizing the information gathered through individual questionnaires and makes them robust. This broader perspective can help in explaining the way they see the cost of compliance and its impact on the industry. The FGDs has been conducted with the respondents of the sample tea estates stakeholders to:

- i. Identify the components of costs that are associated with the SPS quality and standardization compliances for the orthodox tea;
- Understand the perceptions of the respondents regarding the benefits and constraints of implementing SPS compliance (ISO 22000);
- iii. Derive major issues that need to be taken into consideration as the policy implications.

3.1.5 Specification of Models

The approach for quantifying the trade effect of SPS measures which is based on differences in compliance costs between domestic and foreign firms can be implemented by estimating a cost function that incorporates output and quality dimensions, where the latter captures the requirements of the specified SPS measure.

The basic cost function in this study consists of three key components. Total cost is made up of a conventional fixed cost component which is independent of both output and quality; a variable cost component that vary with the use and scale of production inputs.

Likewise, there are other two components of costs namely the fixed quality costs and variable quality costs related to the SPS compliance that are increasingly practiced both in domestic and international trade. In this category also, the quality fixed costs are independent to output and quality variable costs are the respective to the level of output. Again the SPS compliance costs are independent of conventional production inputs. In this framework, cost of compliance is captured by the change in total cost of production that arises from complying with the SPS standard. In principle, before and after production cost data can be used to estimate the cost of compliance.

This study has tried to combine all three analytical approaches identified and described by Antle (1999) to measure the costs of quality compliance of Nepalese tea products especially that are exported in international markets. The accounting approach focuses on the consequences of meeting specified regulatory standards for increases in input requirements and costs but does not involve a parametric estimation of the cost function. The economic-engineering method combines detailed engineering data with corresponding input cost data to construct a quantitative model of the production process. The resulting production function may then be used to derive a parametric cost function. It also offers a robust basis for statistically testing both structural and behavioral relationships embedded in the response of producers and exporters to the SPS regulatory regimes. For this study, variable costs are constructed on the basis of accounting approach, fixed costs are carried out through engineering approach and the analysis is accomplished in econometric approach.

To analyze the comparative cost function in this study, the OLS regression is applied to estimate the individual cluster of cost components of the ISO 22000 rule (e.g. compliance with ISO 22000 plans and implementation). First of all, the association between the output and conventional and SPS costs has been analyzed through the following double log linear regression equations:

 $lnOUTPUT = \alpha + \beta_1 lnCQ_c + \beta_2 lnSPSQ_c + u_i.....(3.1.6)$

For conventional quality cost analysis with respect to output:

 $lnCQ_{c} = \alpha_{0} + \beta_{1} lnOUTPUT + u_{i}....(3.1.7)$

For conventional fixed or set-up cost analysis with respect to output:

$\ln SC_{c} = \alpha_{0} + \beta_{1} \ln OUTPUT + u_{i} \dots \dots$	3.1.8)
For conventional variable or ongoing cost analysis with respect to	o output:
$\ln OC_c = \alpha_0 + \beta_1 \ln OUTPUT + u_i$ (3)	.1.9)
For SPS quality cost analysis with respect to output:	
$\ln SPSQ_c = \alpha_0 + \beta_1 \ln OUTPUT + u_i$ (3.1.10)
For SPS quality fixed or set-up cost analysis with respect to output	ut:
$\ln SPSQS_c = \alpha_0 + \beta_1 \ln OUTPUT + u_i$.(3.1.11)
For SPS quality variable or ongoing cost analysis with respect to	output:
$\ln SPSQO_{c} = \alpha_{0} + \beta_{1}OUTPUT + u_{i}(3)$	3.1.12)

Where, ln is natural logarithm, SC_c is conventional set up or fixed cost, OC_c is conventional variable or ongoing cost SC_q is quality or safety set up or fixed cost, and OC_q is quality or safety variable or ongoing cost. In descriptive part, tables, graphs and diagrams, percentage, have been presented.

3.1.6 Reliability Analysis of the Data

Before assessing the simple regression estimations, this study has attempted to test the reliability of data since they are drawn from the primary source through Cronbach's Alpha reliability test. Cronbach's α is defined as

$$\alpha = \frac{K}{K - 1} \left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2} \right)_{\dots} (3.1.13)$$

where K is the number of components (K-items or testlets), σ_X^2 is the variance of the observed total test scores, and $\sigma_{Y_i}^2$ is the variance of component i for the current sample of persons (Develles,1991).

Alternatively, the Cronbach's α can also be defined as

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K-1)\bar{c})}$$
(3.1.14)

where K is as above, \overline{v} is the average variance, and \overline{c} is the average of all covariances between the components across the current sample of persons.

The standardized Cronbach's alpha can be defined as

$$\alpha_{\text{standardized}} = \frac{K\bar{r}}{(1 + (K-1)\bar{r})}$$
(3.1.15)

where K is as above and \bar{r} the mean of the K(K - 1) / 2 non-redundant correlation coefficients (i.e., the mean of an upper triangular, or lower triangular, correlation matrix).

Cronbach's α is related conceptually to the Spearman–Brown prediction formula. Both arise from the basic classical test theory result that the reliability of test scores can be expressed as the ratio of the true-score and total-score (error plus true score) variances:

$$\rho_{XX} = \frac{\sigma_T^2}{\sigma_X^2} \tag{3.1.16}$$

The Cronbach's Alpha test has been run here to find out the reliability of collected costs of compliance from the field study.

3.1.7 Rank Correlation Coefficient

In addition to some simple regression estimations and other statistical analysis, this study has attempted to assess some perceptual analysis based on the reactions and information drawn from the respondent of sampled tea estates regarding the benefit from the implementation of SPS quality compliances, difficult aspects of SPS quality compliances, and constraining factors for the export growth of Nepalese Tea products. For this, Spearman Rho correlation, which is a nonparametric (distribution-free) rank

statistic proposed by Spearman in 1904 as a measure of the strength of the associations between various variables, has been used. The Spearman rank correlation coefficient can be used to give an R-estimate, and is a measure of monotone association that is used when the distribution of the data make Pearson's correlation coefficient undesirable or misleading.

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}(3.1.17)$$

where, $x = X - \overline{X}$ and $y = Y - \overline{Y}$

The Spearman rank correlation coefficient is defined by:

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n} \qquad (3.1.18)$$

where, r_s is Spearman's rank correlation coefficient, d= difference of corresponding ranks, n= number of pairs of observations. The modified formula for tie (or repeated) rank correlation coefficient is given by:

where, t is number of times that an item repeated.

Because of using ranks given to the variables, the Spearman's rank correlation coefficient is much easier to compute.

3.2 Methodology for the Assessment of Revenue Impact

The analysis presented in the study has covered two broad assessments; time series analysis for periodical comparison among the variables and econometric analysis to examine fiscal implications of trade liberalization. For the econometric analysis part of the study, comparable set of data for the period 1974-75 to 2007-08 has been used. To check the stationarity properties of the variables, this study has used three most widely used tests for unit roots; the Dickey Fuller (DF) test, the Augmented Dickey Fuller (ADF) test and the Phillips Perron (PP) test. After employing the unit root test,

econometric analysis was carried out following the Engle-Granger co integration model to test for valid long-run relationships between the variables.

3.2.1 Conceptual Framework

Quantifying the fiscal impact of tariff reduction has been drawing the interest of researchers along with the inception of trade liberalization initiatives especially of developing and less developed countries. The analysis was crucial as these countries have been facing revenue shortfall coupled with welfare loss effects against the backdrop of trade liberalization. It is, therefore, important to capture the dynamics of changes in total tax revenue, trade tax revenue, non-trade tax revenue in response to trade policies.

There exist a number of approaches and methods to examine the revenue impact of trade liberalization. Very often researchers tend to use computable general equilibrium (CGE) models for the analysis of long run resource allocation implication of trade liberalization. Jones and Morrissey (2008) have applied Difference-in-Differences (DiD) estimation to measure the impact of tariff reductions on import levels and thus the tariff revenue. For analyzing the revenue effect some individual equation techniques are generally employed in which major determinants of revenue components including trade revenue are estimated. Most of such studies (Hitiris, 1990, Ram, 1994, and Tanzi, 1987) focus on the volume of trade and the level of economic development as determinants and hence they give little idea on the effect of trade liberalization on trade tax revenue. Some others most notably Rao (1999) use changes in the openness (trade taxes relative to trade) and tax base (trade relative to GDP) for examining the overall impact on trade tax revenue.

A recent study (Khattry, 2003) uses fixed-effect regression framework for examining the nature of relationship between the effective rate of trade taxation and trade revenue. A case study for Kenya (Glenday, 2000) follows decomposition technique at a fairly disaggregated level to examine the effect of custom rate reductions on total revenue collections. Abgeyegbe et al, (2004) examine the links between trade liberalization and trade tax revenues in Sub-Saharan Africa following single equation regression technique. They incorporate other key macro variables linked to economic liberalization and thus examine the ramification from broader policy perspectives. Although study by Baunsgaard and Keen (2005) follows the similar technique, it tries to delineate the effect of trade taxes on non-trade tax revenue. From both methodological and issue specific point of views, these two studies can be regarded to be relevant and useful. Similarly, methodology employed by Khattry (2003) is important for identifying a revenue-maximizing tariff rate, beyond which trade tax revenues could fall with further tariff cuts.

3.2.2 Nature and Sources of Data

One of the major hurdles to any economic study on Nepal is the paucity or inadequacy of data. Revisions of available data are made frequently. In some cases, it is extremely difficult to distinguish between provisional and actual data (Dahal, 1983). For example, both the publication of National Accounts of Central Bureau of Statistics (CBS) under the National Planning Commission, and Economic Survey of Ministry of Finance publish a series of GDP since 1974-75 while official website of CBS provides series since 1964-65. As the system is based on international guidelines, the methodological changes taken place internationally needs to be accompanied accordingly in Nepal System of National Accounts (SNA). Therefore, CBS has envisaged some activities for implementing 1993 system of national accounts. To implement the system, an assessment of the situation in the context from the old system (1968 SNA) to a new system (1993 SNA) is essential (CBS, 2004). The CBS revised series in 1974-75, 1984-85, 1994-95, 2000-01 and 2005-06 onwards. The GDP data, therefore, for the old and new series do not seem smooth and continuous. The 1993 SNA extends the boundary of own-account goods produced by households to include all goods made both from primary and non-primary goods, allocation of financial intermediation indirectly measured, and inclusion of all illegal production and other transactions (ibid). There is a sudden jump in the figures due to widening of bases by new methodology of SNA. On the other hand, the GDP data for the same period varies inter and intra within publication of CBS and Ministry of Finance, and official website of CBS. The CBS is the only authority to handle facts and figures of national accounts at the macro-level and provides series of GDP since 1964-65. However, all disaggregated data required for this have not been found between 1964-65 to 1973-74. Therefore, this study has taken the data from 1974-75 to 2010-11.

While analyzing the revenue impact due to trade liberalization, this study has used secondary data from various sources. Specifically, the GDP data have been taken from the Economic Survey of various years published from ministry of finance, Nepal. Revenue data have been taken form Budget Speech, ministry of finance and Quarterly Economic Bulletin of Nepal Rastra Bank. Likewise, Population data have been derived from International Financial Statistics of International Monetary Fund, center bureau of statistics. For VAT revenue annual report of Inland Revenue Department has been taken. In addition, various publication and reports submitted to Nepal Government by national and international experts and agencies for example International Monetary Fund (IMF), Financial Comptroller General's Office, Inland Revenue Department, Central Bureau of Statistics, National Planning Commission, and concerned authorities have also been used including books, reports, articles leaflets, magazines, websites and dissertations published and unpublished on the concerned subject matters. The collected data have been processed and tabulated in different ways according to the requirements of the study.

3.2.3 Data Organization, Processing and Presentation

The collected data have been classified, smoothed and presented in the appropriate tables for proper analysis and interpretation. A master table comprising the composition and magnitude of revenues that covers the period 1974-75 to 2010-11 has been developed as to refer the comprehensive data relationships. A separate table of imports volume, total trade, import tax, trade tax, non-trade tax, total tax, GDP at current price, GDP deflator, Population, Per capita GDP, and per capita real GDP has been constructed. Likewise a separate master table of the ratios of import tax to total import (tt₁), ration of total trade to GDP (tt₂), ratio of Total trade revenue to GDP (TT) has also been calculated.

For analyzing and interpreting the data collected from different sources in the process of presentation and analysis, quantitative methods have been applied with the help of Excel (Microsoft Office Excel 2007), EVIEWS (3.0 Version), and SPSS (software package for social sciences – 18 Version). The tables, graphs and diagrams have also been presented.

3.2.4 Data Analysis Procedure

Amidst the approaches, for example, general equilibrium model, Swiss formula approach, or Difference-in-Difference approach, this study has tried to follow the cointegration along with error correction modeling to measure the revenue impacts within the tariff liberalization framework. For this, the following steps have been conducted.

3.2.4.1 Test for the Staionarity Properties of Time Series

One of the major shortcomings while analyzing Macro-economic variables is that they seems very often trending, as they have a tendency to systematically increase or decrease over time (Banergee, et al., 2007). Difference stationary and trend stationary models of the same time series may imply very different predictions (Diebold and Senhadji, 1996). So, rather than employing one or the other model by default, one may use a unit root test as a diagnostic tool to guide the decision. In fact, one of the early motivations for unit root tests was precisely to help determine whether to use forecasting models in differences or levels in particular applications (Dickey, Bell, and Miller, 1986). Since there is obvious evidence that structural macroeconomic time series variables are non-stationary in nature, as consequences, the ordinary least squares (OLS) regressions using these data might produce spurious results. In other words, non-stationary time series could produce highly significant non-sense correlation between variables although in reality there any such relationship may not exist. In order to avoid such problems the integrating properties of the variables should be examined by testing for the existence of unit roots in variables under consideration.

Therefore, to check the stationarity properties of the variables, the most widely used Dickey Fuller (DF) Augmented Dickey-Fuller (ADF) tests and the newly formulated Phillips-Perron (PP) test have been employed in this study. To test the DF, the following equation has been used.

The relevant test involves testing the null hypothesis of $(\rho-1) = 0$ (i.e. the Z_t is non-stationary) against the alternative of $(\rho-1)<0$ (i.e. Z_t is stationary). The t-test on

the estimated coefficient of Z_{t-1} provides the Dickey-Fuller test. If its absolute value exceeds the critical value at the chosen level of significance provided by Dickey and Fuller (1981), the null hypothesis of non-stationarity is rejected and the series is considered I(0). The Augmented Dickey-Fuller test, on the other hand, is a modification of the DF test and lagged values of the depended variables are added in the estimation of equation as:

The t-ratio on (ρ -1) provides the ADF statistics. This test is carried out to ensure that the error process in the estimating equation is residually uncorrelated (Razzaque, Ahmed 2000).⁸

Since it is widely believed that both DF and ADF tests do not consider the cases of heteroscedasticity and non-normality frequently revealed in raw data of economic time series variables, the PP test for unit root has been used in the empirical analysis as:.

The appropriate critical values of the t-statistic for the null hypothesis of nonstationarity are given by MacKinnon (1991).

3.2.4.2 Specification of Models

After employing the unit root test, econometric analysis has been carried out following Phillips-Hansen Fully Modifies Ordinary Least Squares (PHFMOLS) to test the valid long- and short-run relationships between the variables. The PHFMOLS model has been selected in this study for its wider application in recent years. It gives the standard errors that provide the basis for valid inferences in the long run which is absent in the first step of the Engle-Granger co-integration procedure (Bhattacharya et al., 2006). In the pure unit-root case, one popular inferential approach is to fully modify OLS estimator as suggested by Phillips and Hansen (1990). In the near-unit-

⁸ From this perspective, the ADF test is more preferable than the DF test.

root case, a similar method can be considered taking the quasi-differencing operator as:

$$\Delta_C x_t = x_t - x_{t-1} - \frac{C}{T} x_{t-1} = v_t, \qquad (3.2.4)$$

 $y_t^+ = y_t - \hat{\omega}_{12}\hat{\Omega}_{22}^{-1}\Delta_C x_t$ and $\hat{\Lambda}_{12}^+ = -\hat{\omega}_{12}\hat{\Omega}_{22}^{-1}\hat{\Lambda}_{22},$ $\hat{\omega}_{12},\hat{\Omega}_{22}^{-1}$ and $\hat{\omega}_{12},\hat{\Omega}_{22}^{-1}$, $\hat{\omega}_{12},\hat{\Omega}_{22}^{-1}$, $\hat{\omega}_{12},\hat{\Omega}_{22}^{-1}$, $\hat{\omega}_{12},\hat{\Omega}_{22}^{-1}$

 $\bar{\Lambda}_{22}$

are consistent estimates of the respective parameters. The fully modified OLS estimator is now given by

$$\hat{\beta}^{+} = \left(\sum_{t=1}^{T} \underline{y}_{t}^{+} \underline{x}_{t-1}^{\prime} - T\hat{\Lambda}_{12}^{+}\right) \left(\sum_{t=1}^{T} \underline{x}_{t-1} \underline{x}_{t-1}^{\prime}\right)^{-1}, \qquad (3.2.5)$$

where,

$$\underline{y}_t^+ = \underline{y}_t - \hat{\omega}_{12} \hat{\Omega}_{22}^{-1} \Delta_C x_t$$

and,

$$\underline{y}_t = y_t - T^{-1} \sum_{t=1}^t y_t$$

The only difference in the definition of (3.2.5), to the FM-OLS estimator for the pure unit-root case, is the use of the quasi-differencing operator, as opposed to the standard differencing operator.

For checking the existence of long-run relationship among the variables, the ADF tests for residuals were employed in the analysis. The autocorrelation coefficients and the resultant correlograms of the estimated error terms from the long-run equations and their year-by-year plots are also presented in the study. This has been done to address the relatively lower explanatory power of the ADF test, in view of the smallness of the sample size. While running the co-integration test, determination of the optimal lag has been drawn from the Akaike Information Criterion (AIC).

To examine the holistic view of revenue impact on the economy caused by the trade liberalization, the multivariant regression has been employed to analyze the determinants of tax revenue (TR). This has been done by regressing the share of tax

revenue in GDP on natural log of population size (pop), natural log of real per capita GDP (pcRGDP), and index of openness (tt). The following equations are used to estimate the impact of trade liberalization on total revenue in Nepal both in pre and the post-liberalization periods:

 $TR_t = a_0 + \beta_1 \ln pop_t + \beta_2 \ln pcRGDP_t + \beta_3 tt_{1t} + RTR_t + u_t \dots (3.2.6)$, and

 $TR_{t} = a_{0} + \beta_{1} \ln pop_{t} + \beta_{2} \ln pcRGDP_{t} + \beta_{3} tt_{2t} + RTR_{t} + u_{t} \dots (3.2.7)$

Where, TR is the ratio of total revenue to GDP, Inpop denotes natural log of population, InpcRGDP refers to natural log of real GDP, tt_1 is the ratio of import taxes as percent of total import, tt_2 denotes the ratio of trade as percent of total GDP, a_0 is constant, and β_{1} , β_{2} , and β_{3} are coefficients parameters of the independent variables respectively.

Likewise, the determinants of trade tax revenue (TT) are estimated by regressing the share of trade taxes in GDP on both the indexes of openness (tt_1 and tt_2) and logarithms of per capita real GDP (ln pcRGDP).

Hence, the effect of trade liberalization on trade tax revenue has been examined by the following equations:

 $TT_{t} = a_{0} + \beta_{1} \ln pcRGDP_{t} + \beta_{2} tt_{1t} + \beta_{3} tt_{1t}^{2} + RTR_{t} + u_{t}......(3.2.8),$ and

 $TT_t = a_0 + \beta_1 \ln pcRGDP_t + \beta_2 tt_{2t} + \beta_3 tt_{2t}^2 + RTR_t + u_t \dots (3.2.9)$ Where, TT is the ratio of trade tax revenue as percentage of GDP.

Similarly, the effect of openness on non-trade tax revenue or domestic tax revenue has been examined by the following equations:

 $NTT_t = a_0 + \beta_1 \ln pcRGDP_t + \beta_2 tt_{1t} + \beta_3 VAT_{GDPt} + RNTT_t + u_t..... (3.2.10),$ and

where, VAT_{GDP} is VAT GDP ratio.

3.2.4.3 Error Correction Modelling

To examine the short run impacts of trade liberalization variables on revenues, this study uses Error Correction Modelling on the basis of PHFMOLS method. The same effects obsevered by the above equations have also examined applying the short run models, which measure the impacts of trade liberalization variables on revenues that the government generates. The following equations are used to estimate the short run impacts of trade liberalization determinants on total revenue in Nepal both in pre and the post-liberalization periods:

 $\Delta TR_{t} = a_{0} + \beta_{1}\Delta TR_{t-1} + \beta_{2}\Delta lnpop + \beta_{3}\Delta ln \ pcRGDP + \beta_{4}\Delta \ tt_{1}$

 $+ \Delta RTR_{t-1} + u_t$ (3.2.12), and $\Delta TR_t = a_0 + \beta_1 \Delta TR_{t-1} + \beta_2 \Delta \ln pop + \beta_3 \Delta \ln pcRGDP + \beta_4 \Delta tt_2$

Likewise, following equations are used to estimate the short run impacts of trade liberalization determinants on trade tax revenue in Nepal both in pre and the post-liberalization periods:

$$\begin{split} \Delta TT_t &= a_0 + \beta_1 \Delta TT_{t-1} + \beta_2 \Delta ln \ pcRGDP + \beta_3 \ \Delta \ tt_1 + \beta_4 \ \Delta \ tt^2_1 \\ &+ \Delta RTR_{t-1} + u_t \ \dots \ (3.2.14), \ and \\ \Delta TT_t &= a_0 + \beta_1 \Delta TT_{t-1} + \beta_2 \Delta ln \ pcRGDP + \beta_3 \Delta \ tt_2 + \beta_4 \Delta \ tt^2_2 \end{split}$$

Similarly, the short run impacts of trade liberalization determinants on trade tax revenue in Nepal both in pre and the post-liberalization periods are measured by the following equations:

$$\Delta NTT_{t} = a_{0} + \beta_{1} \Delta NTT_{t-1} + \beta_{2} \Delta lnpcRGDP + \beta_{3} \Delta tt_{1} + \beta_{4} \Delta VAT_{GDP}$$
$$+ \Delta RNTT_{t-1} + u_{t} \dots (3.2.16) \text{ and}$$
$$\Delta NTT_{t} = a_{0} + \beta_{1} \Delta NTT_{t-1} + \beta_{2} \Delta ln pcRGDP + \beta_{3} \Delta tt_{2} + \beta_{4} \Delta VAT_{GDP}$$

3.2.5 Elasticity of Trade Tax Revenue

This study also tries to assess the productivity of trade openness variable (trade revenue index) through the measurement of elasticity of trade tax revenue taking the Trade Tax Revenue (TTR) as the dependent variable and Trade Revenue Index (TRI) as independent variable of two different tome periods i.e. from 1975-91 as the first period and 1992-2010 as the second period. The midway elasticity coefficient of these two different time periods has been assessed from the following elasticity formula.

$$E_{ttr} = \frac{\Delta TTR}{\Delta TRI} \times \frac{(TRI_{t} + TRI_{t-1})}{(TTR_{t} + TTR_{t-1})}....(3.2.18)$$

Where, E_{ttr} = Average elasticity coefficient; TRI_t = Trade revenue index at time t; TRI_{t-1} = Trade revenue index at time t-1; ΔTRI = TRI_t-TRI_{t-1} =Change in trade revenue index; TTR_t = Trade tax revenue at time t; TTR_{t-1} = Trade tax revenue at time t-1; and ΔTTR = TTR_t-TTR_{t-1} = Change in trade tax revenue.

3.2.6 The Chow Test

An important way of assessing the reliability of an econometric model, especially in view of policy simulations, consists in checking whether it is stable over time. This problem can be formalized as one of testing whether the coefficient vectors in several regressions (corresponding to disjoint sub-periods) are equal (Dufour, 1982). The Chow test thus aims to test equality of sets of coefficients in two regressions is now widely used in econometric and other research. As the regression model involving time series data might have structural change in the relationship between the regressand and the regressors, the values of the parameters of the model do not remain the same through the entire time period.

The Chow test is commonly used to test for structural change in some or all of the parameters of a model in cases where the disturbance term is assumed to be the same in both periods i.e., coefficients of some or all of the explanatory variables are the same between two groups and it is valid to pool the data across these groups (Gujarati, 2003).

For the Chow test, the following formula has been applied:

$$F_{cal} = \frac{(RSS_R - RSS_{UR})/K}{(RSS_{UR})/(n_1 + n_2 - 2k)} \approx F_{tab[k,(n_1 + n_2 - 2k)]} \qquad \dots \dots (3.2.19)$$

Where, RSS_R is restricted residual sum of squares, RSS_{UR} is unrestricted residual sum of square ($RSS_1 + RSS_2$), k is number of parameters, and n's is number of observations.

3.2.7 Hypothesis of the Study

The present study has attempted to test the hypothesis in two different clusters of the analysis i.e., measuring the costs of SPS compliance for Nepalese highland orthodox tea and assessing the revenue impacts of tariff liberalization. Dealing with the cost of SPS compliance for orthodox tea, the study takes output (total production of orthodox tea of the sample tea estates) as independent variable and different cost clusters i.e., conventional set-up and ongoing costs, SPS set-up and ongoing costs as dependent variables. Likewise, in analyzing the revenue impact of tariff liberalization, the variables such as import tax as percentage of total import (tt₁), total trade as percentage of GDP (tt₂), natural log of population, natural log of per capita real GDP, VAT as percentage of GDP (VATTOGDP) have been taken as independent variables, while total tax revenue as percentage of GDP (TR), trade tax revenue as percentage of GDP (NTT) have been taken as dependent variables. To analyze the relationships of the variables mentioned above, this study has set the following hypothesis:

(i) Overall Significance of Model Specified for SPS Compliance

 H_0 : Null hypothesis: There is no significant impact of the SPS compliance on different types of costs individually as dependent variables with respect to production of tea as independent variables.

 H_1 : Alternative hypothesis: There is significant impact of the SPS compliance on different types of costs individually as dependent variables with respect to production of tea as independent variables.

(ii) Overall Significance of Model Specified for the Revenue impact of Tariff Liberalization

 H_0 : Null hypothesis: There is no significant impact of tariff liberalization on the total revenue, trade tax revenue, and non-trade tax revenues of the government.

 H_1 : Alternative hypothesis: There is significant impact of tariff liberalization on the total revenue, trade tax revenue, and non-trade tax revenues of the government.

(iii) Overall Significance of the Model Specified for Structural Changes through economic openness (trade liberalization)

 H_0 : Null hypothesis: There is no significant impact of tariff liberalization on the different macroeconomic parameters such as total revenues, trade tax revenues, non-trade tax revenues, total trade, export, import and real GDP.

 H_1 : Alternative hypothesis: There is significant impact of tariff liberalization on the different macroeconomic parameters such as total revenues, trade tax revenues, non-trade tax revenues, total trade, export, import and real GDP.
CHAPTER IV

WTO AND DEVELOPING COUNTRIES

4.1 Economic Framework and International Trade

International trade has remained an important dimension in every economic framework that evolved in a certain interval in the history of economic paradigms. The basic theoretical foundation of the international trade was emerged in capitalism¹ or in classical economic setting as the theory of comparative advantage. In simple classical perspective propounded and developed by Adam Smith, David Ricardo, and thereafter Robert Torrens and J. S Mill, international trade is obvious due mainly to the differences between the countries in factor mobility, currencies and exchange control policies, national policies, natural resources, and markets. These differences ultimately turn out the comparative advantage for a country in producing a good at a lower opportunity cost than another country, and hence the international trade is possible. Because of the technology differences, relative prices of the two goods will differ between countries. The price of each country's comparative advantage good can be lower than the price of the same good in the other country. If one country has an absolute advantage in the production of both goods (as assumed by Ricardo) then real wages of workers (i.e., the purchasing power of wages) in that country will be higher in both industries compared to wages in the other country.

However, technological superiority is not enough to guarantee continued production of a good in free trade. A country must have a comparative advantage in production of a good, rather than an absolute advantage, to guarantee continued production in free trade. From the perspective of a less developed country, the

¹ Capitalism is defined as an economic system where private actors are allowed to own and control the use of property in accord with their own interests, and where the invisible hand of the pricing mechanism coordinates supply and demand in markets in a way that is automatically in the best interests of society. Government, in this perspective, is often described as responsible for peace, justice, and tolerable taxes. Thus microeconomics in a capitalist economy is the study of how markets coordinate decentralized decision making through a price mechanism to bring supply and demand into equilibrium. Capitalism is a largely self-regulating economic system in which the proper role of government is limited to providing certain basic public goods and services at a possible low cost.

developed countries' superior technology need not imply that LDC industries cannot compete in international markets.

On the other hand, in a command $economy^2$ international trade remains a subject to state control. In the centrally planned economy, macroeconomic forces such as domestic aggregate demand and supply (aggregate supply is monopoly in nature) determine foreign trade flows. The general specification in command economy includes a planners' demand equation for the volume of imports, a planners' supply equation for the volume of exports, and a rest-of-world demand equation for the export price level. Hence, the central planning system, connected with the monopoly in the field of foreign trade, creates very convenient conditions of the geographical allocation of foreign trade, which leads to the maximum level of advantage under a given commodity structure of foreign trade (Glowacki: 1966). However, the Marxian perspective - in which the principle of command economy resides on - had a dialectical approach to free trade as against the background of the Ricardo's theory of comparative costs. The international trade and capital flow in Marxian view is simply a process of growing one enrich at the expenses of another like within a country one class can enrich itself at the expense of another (Sau: 1977).

In liberal economic setting or in the market economy, international trade has become a vital component for the country's economic growth and strength due to the globalization of rule based multilateral trade. Since Liberalization aims at reforming national economic and business policies, legislation, and legal arrangements liberal to make conducive environment for the free flow of goods, survives, foreign direct investment, creations, images, and properties of intellectualities, it helps create to the increasing linkages among countries or the deeper integration of the world economy by trade, finance, direct investment, and technology through globalization.

² Command economy or planned economy, the central or state government regulates various factors of production as a final authority to take decisions regarding production, utilization of the finished industrial products and the allocation of the revenues earned from their distribution. In this economic framework, both state-owned and private enterprises receive guidance and directives from the government regarding production capacity, volume, modes of production and course of their actions. Planned economic system is broadly segregated into two groups – Centralized and Decentralized. The centralized or centrally Planned Economy is a more familiar concept between the two. The decentralized Command Economy, on the other hand, is more theoretical in nature with little or no application in the actual economic spheres.

International trade in globalization spurred by liberalization is marked by the following factors.

- **i.** New markets: under which foreign exchange and capital markets are linked globally, operating 24 hours a day, with dealings at a distance in real time;
- ii. New tools, including internet links, cellular phones and media networks;
- **iii. New actors**, with the world trade organization having authority over national governments, the multinational corporations having more economic power than many states, the global networks of NGO's and other groups that transcend national boundaries; and
- **iv. New rules** with multilateral agreements on trade, services, and intellectual property rights, backed by strong enforcement mechanisms and more binding for national for national governments, reducing the scope for national policy.

4.2 Development of Rule-Based Multilateral Trade (ITO, GATT and WTO)

The underlying idea and the conceptual origin of the rule-based multilateral trading regime go back to World War II. The leaders of the allied powers were of the view that one of the main causes of the war was the failure of the open world trading system in the 1930s. They agreed that the enduring peace and welfare of nations were inextricably connected with mutual friendly relations, fairness, equality, and the maximum predictable degree of freedom in international trade (Khalid, 1999).

Following World War II, nations throughout the world sought to establish an open and nondiscriminatory trading system with the goal of raising the economic well-being of all countries. Aware of the role of trade barriers in contributing to the economic depression in the 1930s, and the military aggression that rose following the depression, the countries that met to discuss the new trading system saw open trade as essential for economic stability and peace.

The intent of these negotiators was to establish an International Trade Organization (ITO), which would address not only trade barriers but other issues indirectly related to trade, including employment, investment, restrictive business practices, and commodity agreements. The ITO was to be a United Nations specialized agency, but the ITO treaty was not approved by the United States and a few other signatories and never went into effect. Instead, a provisional agreement on tariffs and trade rules, called the General Agreement on Tariffs and Trade (GATT) was reached and went into effect in 1948. This provisional GATT became the principal set of rules governing international trade for the next 47 years.

Over the years, the GATT ensured liberalization of world trade through the elimination or reduction of tariffs and other barriers to merchandise trade. It was responsible for the manifold expansion of international trade. The greatest achievement of the GATT was establishing its role as a rules-based system for the conduct of trade relations among nations, which averted further 1930s-like economic depressions.

During more than four decades of post war period, the GATT has sponsored eight rounds of trade-policy negotiations. The latest round of negotiations, which was completed in 1994, resulted in the creation of the WTO. The WTO includes the text of GATT, but it also goes further and embodies a set of agreements that build on and extend GATT principles to new areas. The central role played in the world economy by GATT/WTO is widely accepted. As a result, through the eight rounds of GATT negotiations, the average ad valorem tariff on industrial goods has fallen from over 40% to below 4% (Bagwell and Staiger, 2003).

4.3 Paradigm Shift with Uruguay Round and the Establishment of WTO

Over the years, the GATT ensured liberalization of world trade through the elimination or reduction of tariffs and other barriers to merchandise trade. It was responsible for the manifold expansion of international trade. The greatest achievement of the GATT was establishing its role as a rules-based system for the conduct of trade relations among nations, which averted further 1930s-like economic depressions.

Despite this success, by the 1980s several problems had surfaced with the GATT apparatus. Firstly, the dispute resolution mechanism of GATT was not functioning as effectively as had been hoped. Countries with longstanding disagreements were unable to reach any sort of resolution on a number of issues, ranging from government subsidies for exports to regulations regarding foreign direct investment. Secondly, a number of commodities like telecommunication and textiles products were widely exempt from GATT disciplines. Thirdly, it was widely believed that certain forms of administered trade protection – antidumping duties, voluntary export restraints, and countervailing duties - were restricting trade and distorting trade patterns in many important sectors. Fourthly, trade in services was expanding rapidly and GATT had no rules regarding trade in services. Fifthly, countries that produced intellectual property – movies, computer programs, patented pharmaceuticals – were becoming increasingly frustrated by the lack of intellectual property protection in many developing nations. Lastly, the rules regarding trade-related investment measures - for example, domestic purchase requirements for plants built from foreign direct investment – were hotly disputed.

Moreover, GATT rules never fully applied to agriculture, and its basic principles and some of its main rules were rendered largely inoperative in the case of textiles and clothing. The GATT also lagged behind new developments in international trade. Initially, its rules applied to trade in goods only. Trade in services, which had grown rapidly and had become an important and dynamic element of international trade, was not subject to GATT rules.

When the Uruguay Round negotiations started in 1986 under GATT framework, it was not envisaged that a new organization would be established to implement the results of the negotiations. However, as the negotiations developed and growth in two new areas, services and intellectual property, became increasingly visible, the countries taking part in the Uruguay Round started focusing on the need for establishing a permanent institutional setup to implement and administer the results of the negotiations. It was agreed that an umbrella organization was needed to house the outcome of negotiations in goods, services, and trade-related aspects of intellectual property rights, and to implement the 20 or so agreements and legal texts negotiated and accepted as a single undertaking.

Table 4.1

A Brief History of the WTO

1946-47	Negotiations among 50 countries, sponsored by the United Nations, to				
	establish an International Trade Organization (ITO) alongside the World				
	Bank and International Monetary Fund. A draft ITO Charter is drawn up.				
	In parallel, 23 countries decide to negotiate a set of tariff reductions among				
	themselves and to adopt some of the draft ITO trade rules. The tariff				
	concessions	s and rules together are	called the General Agreen	nent on Tariffs	
	and Trade (GATT).			
	GATT ente	rs into effect on a provis	sional basis. Of the 23 orig	ginal members,	
1948	11 are developing countries.				
	The UN Conference on Trade and Employment, in Havana Cuba, adopts the				
	ITO Charter, but it remains subject to ratification by national legislatures.				
1950	United States government announces that it will not seek ratification of the ITO				
	Charter because of opposition in Congress. The ITO therefore became defunct.				
1948-95	GATT remains in place as a "provisional" agreement.				
	Seven completed trade rounds under GATT				
	Year	Place/name	Subjects covered	Countries	
	1947	Geneva	Tariffs	23	
	1949	Annecy (France)	Tariffs	13	
	1951	Torquay (UK)	Tariffs	38	
1948-86	1956	Geneva	Tariffs	26	
	1960-61	Geneva (Dillon	Tariffs	26	
		Round)			
	1964-67	Geneva (Kennedy	Tariffs and anti-	62	
		Round)	dumping rules		
				100	
	1973-79	Geneva (Tokyo	Tariffs, rules on non-	102	
	1973-79	Geneva (Tokyo Round)	Tariffs, rules on non- tariff barriers, etc.	102	
	1973-79 "Part IV" (Geneva (Tokyo Round) of the GATT is added	Tariffs, rules on non- tariff barriers, etc. to provide more favorable	treatment for	
1964	1973-79 "Part IV" of developing	Geneva (Tokyo Round) of the GATT is added countries, in particular,	Tariffs, rules on non- tariff barriers, etc. to provide more favorable that could receive tariff be	treatment for enefits in trade	
1964	1973-79 "Part IV" of developing negotiations	Geneva (Tokyo Round) of the GATT is added countries, in particular, s without necessarily ma	Tariffs, rules on non- tariff barriers, etc. to provide more favorable that could receive tariff be king a reciprocal offer.	treatment for enefits in trade	

1973	schemes for developing countries. These schemes, like the GSP, would
	otherwise be contrary to the MFN rule.
	The Uruguay Round is launched in Punta del Este, Uruguay. Its mandate is
	the biggest ever, covering tariffs and non-tariff rules, but also extending the
	trading system into the new areas of services trade and intellectual property
1986	rights. In addition, it was to completely re-design the dispute settlement
	system and establish a new trade organization to replace the "provisional"
	GATT.
1993	December 20: agreement is reached on all Uruguay Round dossiers.
	Approximately 23,000 pages of legal texts and national commitments on
	goods and services.
1995	The "Marrakesh Agreement" establishing the World Trade Organization
	comes into effect.
1995-	Implementation of most Uruguay Round agreements, including those on
2005	agriculture, textiles, intellectual property, customs valuation and other non-
	tariff barriers.
1997	Additional agreements are reached covering financial services and basic
	telecommunications services.

Source: Author's collections from different documents

Hence, the most important paradigm shift that came about from the Uruguay Round negotiations was the establishment of a new trade structure – the WTO – to administer and police new and existing free trade agreements, to oversee world trade practices, and to settle trade disputes among the member states. The WTO has incorporated many changes reached during the Uruguay Round: the former GATT with its newly negotiated reforms, bodies to oversee the new trade agreements, a stronger dispute resolution procedure, a regular review of members' trade policies, and many other committees and councils.

4.4 An Overview of the Uruguay Round Agreements

The Uruguay Round negotiations culminated in the Marrakesh Agreement establishing the WTO, to which are annexed 13 multilateral trade agreements, an understanding on dispute settlement, and a trade policy review mechanism. A brief overview of the Uruguay Round agreements is given in the following paragraphs.

(i) Agreement on Agriculture

The Uruguay Round Agreement on Agriculture sets in motion a reform program aimed at subjecting trade in agricultural products to the market mechanism and at progressively eliminating interventionist policies. The agreement provides for the elimination of all quantitative restrictions and other non-tariff measures, conversion of these to tariffs, and the lowering and binding of all import tariffs. The agreement also provides for disciplines on domestic support and export subsidies to agriculture, and the reduction of these by agreed margins (Appendix III).

(ii) Agreement on Textiles and Clothing

The Agreement on Textiles and Clothing aims at the progressive phase-out of the multitier arrangement (MFA) restrictions on textiles and clothing over a 10-year period starting from the beginning of 1995. During that time, textiles and clothing products will be progressively integrated into the GATT, and existing quotas will be automatically increased by agreed-upon percentages. At the end of the phase-out period, trade in textiles and clothing will be governed once again by the normal rules of the GATT, as applicable to all other products.

(iii) Agreement on Subsidies and Countervailing Measures

The Uruguay Round Agreement on Subsidies and Countervailing Measures lays down rules on the subsidies for industrial products and on countervailing duties to counteract the effects of subsidies. Subsidies are divided into three categories: prohibited subsidies, actionable subsidies, and non-actionable subsidies.

Export subsidies and those contingents on the use of domestic over imported products are categorized as prohibited subsidies. However, least developed countries and developing countries whose per capita income is less than US\$1,000 are exempt from this restriction and may use prohibited subsidies. Non-actionable subsidies include those for research and development for backward regions, and for environmental reasons. All remaining subsidies are actionable subsidies.

The rules and procedures on the use of countervailing measures to offset the injurious effects of subsidized imports have been given precision and clarity in the Agreement on Subsidies and Countervailing Measures.

(iv) Agreement on Anti-dumping

The Agreement on Anti-dumping elaborates the provisions of Article VI of GATT 1994. It defines dumping and contains rules for the use of antidumping measures if dumped imports cause or threaten injury to domestic producers. The agreement also contains detailed rules and procedures on the investigation of dumping cases, on the calculation of dumping margins, on the determination of injury, and on other related aspects.

(v) Agreement on Safeguards

Whereas the agreements on Antidumping and on Subsidies and Countervailing Measures provide remedies for domestic producers if they are hurt by unfair imports, the Agreement on Safeguards provides remedies for domestic producers injured by fairly traded imports. It allows the use of temporary protective measures but sets rules to guard against the abuse of such measures.

(vi) Agreement on Trade-Related Investment Measures (TRIMs)

The TRIMs Agreement identifies trade-related investment measures that are against the provisions of the GATT, especially Articles III and XI of the GATT, and prohibits the use of such measures.

(vii) Agreement on Customs Valuation

The Agreement on Customs Valuation aims at providing greater uniformity and certainty in the application of customs valuation rules and procedures. It provides for a fair, uniform, and neutral system for the valuation of goods for customs purposes, and precludes the use of arbitrary or fictitious customs values. Transaction value is the principle basis and method of value. If transaction value is neither nor available nor reliable, five other methods of valuation can be used, but these must be used in sequential order.

(viii) Agreements on Technical Barriers to Trade and on Sanitary and Phytosanitary Measures

The TBT and SPS Agreements do not question the right of governments to use technical regulations, standards, and sanitary and phytosanitary measures for health and safety reasons. However, the agreements make provisions prohibiting the use of such measures to create unnecessary obstacles to trade. Accordingly, the agreements contain provisions to regulate the use of standards and SPS measures, and to ensure transparency. The SPS Agreement also requires that SPS measures be based on scientific justification.

(ix) General Agreement on Trade in Services (GATS)

The General Agreement on Trade in Services establishes rules of conduct governments must follow in their laws and regulations relating to services. It contains general obligations applicable to all WTO members and all service sectors. These include non-discriminatory treatment, transparency, rules relating to monopolies, and fair and equitable procedures for the recognition of qualifications of service providers.

This agreement also provides for specific commitments by member countries to open up certain sectors of services to import competition. Thus, member countries have made commitments, with regard to specific sectors on market access and national treatment, whereby the service suppliers of one country may supply services to another, and foreign and domestic service suppliers may be treated on an equal basis. This is a first, but significant step. Negotiations will continue in the future for greater liberalization of services trade.

(x) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs)

The TRIPs Agreement establishes multilateral obligations to provide and enforce intellectual property rights in the area of patents, copyrights, trademarks and industrial designs. The agreement sets minimum standards of protection for different types of rights; it also improves the coverage of certain rights. More importantly, it establishes detailed obligations for governments to provide effective means of action that enable affected persons to secure the enforcement of their rights. The procedures and remedies include criminal penalties for willful acts of counterfeiting and piracy on a commercial scale.

(xi) Understanding on Dispute Settlement

The Uruguay Round Understanding on Rules and Procedures Governing the Settlement of Disputes improves upon the GATT rules and procedures, and is the cornerstone of the multilateral trading system. The new system is designed to work efficiently and effectively: There is a guaranteed right to a panel, and the panel process is subject to strict time limits for each step. Panel reports are adopted unless there is a consensus to reject a report, and a country can request an appellate review of the legal aspects of a report.

After a panel report has been adopted, a member country must bring its laws, regulations, or practice into conformity with panel rulings and recommendations within a certain time limit, and retaliation is authorized in the event a member does not bring its laws into conformity with its obligations within that period.

The automatic nature of the new procedures will vastly improve the enforcement of the substantive provisions in each of the agreements. Members will not be able to block the adoption of panel reports and will have to implement obligations promptly. Aggrieved members will be able to obtain compensation or take retaliatory action if the member in violation fails to comply. Retaliatory action may consist of increases in bound tariffs or other actions. These actions may also be authorized when the TRIPs or services agreements are violated.

The World Trade Organization (WTO), successor to the General Agreement on Tariffs and Trade (GATT) established in the wake of the Second World War, is one of the youngest international organizations, and deals with the rules of trade between nations at a global or near-global level. Thus while the WTO is still young, the multilateral trading system that was originally set up under GATT is nearly 60 years old.

WTO, established on 1st January 1995 in the last and largest GATT round of negotiations – the Uruguay Round (1986-1994), promotes and enforces the provisions

of trade laws and regulations. It has the authority to administer and police new and existing free trade agreements, to oversee world trade practices, and to settle trade disputes among the member states (Appendix II). Whereas GATT had dealt mainly with trade in goods, the WTO and its agreements cover trade in goods and services, traded inventions, creations, and designs (intellectual property), dispute settlement mechanism as well as trade policy review mechanism.

4.5 **Principles of WTO**

The basic principles of the WTO are built on those of the GATT. Relatively few and simple, they are far reaching in importance, and have been the guiding light for the past 50 years and should continue to illuminate the path of the multilateral trading system well into the new millennium. These basic principles are discussed below.

(i) Non-Discriminatory Most Favored-Nation Treatment

The most important and fundamental principle of the WTO is non-discriminatory treatment or, to be legally precise, most favored nation (MFN) treatment. What it means is simply that any advantage, favor, privilege, or immunity granted by one WTO member to another has to be granted immediately and unconditionally to all other members.

In the case of goods, MFN treatment applies to customs duties, other border duties and charges, rules and regulations relating to imports and exports, methods of levying customs duties, and international transfers of payments for imports or exports. If, for example, a WTO member reduces the customs duty on a particular product imported from a specific country, it has to reduce the duty to the same extent for imports of that product from all WTO members.

MFN treatment also applies to trade in services. A WTO member is under the obligation to give the same treatment immediately and unconditionally to all WTO members that it gives to any specific country in respect to any measure applicable to services. Similarly, for intellectual property rights, any advantage, favor, privilege, or immunity granted by a WTO member to the nationals of one country has to be granted immediately and unconditionally to the nationals of all WTO members.

There are, however, some exceptions to the MFN rule. For example, WTO member countries may grant more favorable treatment to countries with which they have customs unions, free-trade areas, or economic integration arrangements. Such favorable treatment need not be extended to all other WTO members. In the case of services, member countries may make exceptions for some measures applicable to particular sectors for a limited period not exceeding 10 years.

(ii) National Treatment

The principle of national treatment implies that imported goods and services and foreign services suppliers will be given treatment that is no less favorable than that given to domestic goods and services and to domestic service suppliers. The principle is observed by giving either the same treatment or more favorable treatment to imported goods and services and to foreign service suppliers as that given to domestic goods and services and to domestic service suppliers as that

In addition, whereas national treatment is unqualified in the case of goods, for services it is applicable to those service sectors and sub-sectors on which a WTO member has made specific commitments that are recorded in its schedule of commitments. The TRIPs Agreement obliges each WTO member to accord the nationals of other WTO members no less favorable treatment than that it accords to its own nationals with regard to the protection of intellectual property rights. There is, however, an exception to national treatment as provided in the Paris, Bern and Rome Conventions.

(iii) Stability and Predictability

The stability and predictability of trading conditions is another basic principle of the WTO. Stable and predictable conditions of access to markets promote confidence because investors and traders can plan their investments secure in the knowledge that market access conditions will not change for the worse. This is achieved through the binding of tariffs and conditions of market access for services.

Tariffs on different products that are reduced or agreed to in trade negotiations are bound; that is, a country agrees that it will not levy tariffs at rates higher than those agreed to. Tariffs on all agricultural products have been bound by each WTO member, both developed and developing. As for industrial products, developed countries have bound tariffs on practically all products, while developing countries have bound them for more than 70 percent of their products. Bound rates of tariffs for different products are recorded by each country in its schedule of tariff concessions and commitments. Every WTO member is required, as a necessary condition of membership, to have a schedule of tariff concessions and commitments.

A similar devise applies to services. Each WTO member is obliged to have a schedule of specific commitments on services that lists the service sectors and sub-sectors for which a country agrees to provide market access and national treatment in its market. Members are permitted to place any limitations or conditions on market access and national treatment. The sectors and sub-sectors of services included in a schedule, and the limitations and conditions on market access and national treatment are bound; that is, they cannot be changed to make them less advantageous.

WTO rules do provide the possibility, in exceptional cases, to change the bindings on goods and services, but this can only be done after negotiations with affected countries and after compensating them. Under normal circumstances, bindings cannot be altered adversely.

(iv) Transparency

WTO rules oblige member countries to ensure transparency in their foreign trade regimes by requiring them to publish all laws, regulations, measures, and administrative decisions affecting trade. The publication of laws has to be done in a manner that allows importers, exporters, consumers and investors to be aware of them. Transparency is also ensured by requiring member countries to submit periodic notification to the WTO Secretariat on different aspects of the trade regime.

(v) Trade Liberalization

As mentioned earlier, the WTO is not an organization for free trade, since it does allow protection. However, one of the principles of the WTO is progressive liberalization of trade in goods and services. This principle is rooted in the belief that the removal or reduction of trade barriers results in an expansion of international trade that is to the benefit of all countries. To achieve progressive liberalization, the WTO provides a forum for trade negotiations and a framework for implementing the results of such negotiations.

(vi) Fair Competition

One of the basic principles of the WTO is fair competition in international trade. The rules on MFN treatment and national treatment are designed to promote fair competition. WTO rules also contain disincentives or remedies against unfair competition, such as dumping or subsidization that causes injury to domestic industries.

(vii) Special and Differential Treatment

Another principle of the WTO is special and differential treatment for developing countries. In practice, this permits easier conditions for poorer countries. This can mean not applying certain provisions of new agreements to developing countries. It can also mean providing poorer nations with more time to implement such provisions than for developed countries.

(viii) Economic Development

The WTO is also featured with the principle of economic development of developing countries. There are many provisions in different WTO agreements designed to promote economic development of developing countries and to encourage economic reforms both in developing countries and in transition economies.

4.5.1 Objectives and Functions of the WTO

4.5.1.1 Objectives

The objectives of the WTO, as enshrined in the preamble of the Marrakesh Agreement, are as follows:

...raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of, and trade in, goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustained development, seeking both to protect and preserve the environment.

A supplementary objective of the WTO is to ensure that developing countries, and especially the least developed among them, secure a share in the growth in international trade commensurate with the needs of their economic development."

These objectives are sought "by entering into reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international trade relations."

4.5.1.2 Functions

The WTO is the legal and institutional foundation of the multilateral trading system. It provides the contractual obligations determining how governments frame and implement trade legislation and regulations. And it is the platform on which trade relations among countries evolve through collective debate, consultations, and negotiations. The three main pillars of the WTO are the GATT and its associated agreements on trade in goods, the General Agreement on Trade in Services (GATS), and the Agreement on Trade- Related Intellectual Property Rights (TRIPs). These are reinforced by subsidiary bodies and agreements, the most important of which are the Dispute Settlement Rules and Procedures and the Trade Policy Review Mechanism. The principal functions of the WTO are:

- i. To implement and administer the multilateral and plurilateral trade agreements that together make up the WTO;
- ii. To act as a forum for multilateral trade negotiations and a framework for implementing the results of such negotiations;
- iii. To seek to resolve trade disputes by administering the Understanding on Rules and Procedures Governing the Settlement of Disputes;
- iv. To oversee national trade policies through the Trade Policy Review Mechanism; and
- v. To cooperate with other international institutions involved in global economic policy making.

4.5.2 Some Critical Views on WTO

Given the WTO's history of managing the world trade for the past twelve years, and despite the clarifications to these misinterpretations, some sectors continue to view the WTO with suspicion. The blame was laid on the WTO for the Asian Financial Crisis (1997-1998), as well as the global warming problem (Forrer et al, 2002).

The Global-Exchange, which is a U.S.-based non-governmental organization, is one of the most critical groups of the WTO. It cited twelve reasons to oppose the WTO, arguing that the WTO is writing a global constitution, and that the trade ministers and corporate Chief Executive Officers (CEOs) controlling the WTO wants the world to believe that its purpose is to inspire growth and prosperity for all.

However, in reality the WTO has been the major tool for removing democratic control of resources from communities, and putting it into the hands of corporations. As a result, an international movement is growing to oppose the corporate rule of the WTO to replace it with a democratic global economy that benefits people and sustains communities. The Global Exchange in its publication "Top Ten Reasons to Oppose the World Trade Organization" raised the following critical arguments against the WTO.

4.5.3 Criticism over Democracy Deficit in the WTO

The policies of the WTO impact all aspects of society and the planet, but it is not a democratic, transparent institution. The WTO rules are written by and for

corporations with inside access to the negotiations. For instance, 17 'Industry Sector Advisory Committees' provide the US Trade Representative their heavy input for negotiations.

While the inputs provided by input by consumer, environmental, human rights and labor organizations Citizen are consistently ignored. In addition to that, any request for even simple information is rejected or denied, and the proceedings are held secretly. The WTO is seen as a secret global government that is non-elected and without accountability.

i. Criticism over the Consequences of WTO: A Less Safe World

The idea of the WTO tends to promote the belief that by creating a world of 'free trade', global understanding and peace will prevail. It is in fact the exact opposite, where the domination of international trade by rich countries to benefit their individual interests increases the feeling of anger and resentment, resulting in a less safe developed world. Taking the incidence of September 11th as an example, the developed countries believe that the poorer ones are getting more desperate at the increasing power of the rich developed world. The proponents of this criticism argue that building real global security, there is a need for international agreements that respect people's rights to democracy and trade systems that promote global justice.

ii. The WTO and Labor and Human Rights

WTO rules prioritize the 'rights' of corporations to profit over human and labor rights. Instead of promoting labor standards that are internationally recognized, the WTO encourages workers to pit against each other by what is called 'race to the bottom' in wages. The WTO has declared and ruled the illegality to ban the production of a commodity based on the way it is produced; an example of such is using child labor. In addition, It has also ruled that governments should not consider the 'non commercial value' when making purchasing decision. Such values include human rights, or the behavior of companies that follow a vicious dictatorships attitude such as Myanmar. It is important to note that the WTO has more power when it comes to punishing countries that violate its rules; even more power than the United Nations has to sanction violators of international human rights standards.

iii. The WTO Support for the Privatization of Primary Services

The WTO tries to privatize fundamental public services such as education, health care, energy and water. Privatization means selling public assets, like radio airwaves or schools, to private corporations (usually foreign corporations) with the aim of making profit and destroying their nature of being public goods. The WTO is seeking to privatize the most important public services like education, health care, energy and water. The WTO's General Agreement on Trade in Services (GATS) contain a list of about 160 threatened services such as elder and child care, sewage, garbage, park telecommunications, maintenance, construction, banking, insurance, transportation, shipping, postal services, and tourism. Some countries have already started the process of privatization. The ones that would suffer the most from privatization are those that are unable to pay for the previously public goods and services such as the working class and marginalized communities.

iv. The WTO's Adverse Impact on the Environment

Few corporations have used WTO to take apart the hard-won local and national environmental protections which are attacked as 'barriers to trade'. According to the first WTO panel, the provision of the US Clean Air Act was illegal; the provision required not only the domestic but also the foreign producers to generate cleaner gasoline. The Endangered Species Act was declared by the WTO, because this act required US sold shrimp to be caught with a cheap device that endangered sea turtles. Few attempts has been done by the WTO to deregulate industries such as logging, fishing, water utilities, and energy distribution, these attempts might lead to more exploitation of natural resources.

v. Criticism over WTO's Negative Effects on Human's Health and Lives

The 'Trade Related Intellectual Property' rights (TRIPS), which deals with patents, copyrights and trademarks are strongly defended by WTO. WTO defends to these rights has a negative effects on health and human lives. For instance, the pharmaceutical companies' has been given 'right to profit' from the WTO, while on the other hand, few governments are trying to protect their citizens' health by providing lifesaving medications in areas such as sub-Saharan Africa where thousands of people die daily as result of HIV/AIDS. By affirming their right to produce generic drugs (or import them if they lacked production capacity), developing countries achieved a significant victory in 2001; as a result, they had the means to provide essential lifesaving medicines to their populations with less expensive prices (Global Exchange, 2008). Unfortunately, the production of those drugs has become more difficult ever since the new conditions placed in September 2003.Clearly, the WTO demonstrates its preference for corporate profit over saving human lives.

vi. The WTO and the Escalation of Inequality

Free trade is not working in favor of the majority of the world. It is clearly noticed that inequality increased on both the international front and within countries during the most recent period of rapid growth in global trade and investment (1960 to 1998). The United Nations Development Program (UNDP) reports that the richest 20 percent of the world's population consume 86 percent of the resources, on the other hand, the poorest 80 percent consume 14 percent. The WTO rules have accelerated these trends through opening up countries to foreign investment; consequently, smoothening the movement of modes of production where labor is cheaper and easily exploited, and where environmental costs are low.

vii. The WTO and the Rising Hunger

In spite of the fact that, on the global level, farmers produce enough food for everyone, yet the corporate control of food distribution results in chronic malnutrition for almost 800 million people worldwide. Food is a human right according to the Universal Declaration of Human Rights. In developing countries, agriculture is the major source of living to the majority of people. WTO's Agreement on Agriculture states that market forces should control agricultural policies rather than a national commitment to ensure food security and preserve decent incomes for farmers' households. WTO policies have allowed dumping of heavily subsidized food into poor countries; as a result, local production decreased and hunger began to grow (Global Exchange, 2008).

viii. The WTO's Support for Rich and Powerful Nations Against Small and Poor Nations

In theory, it supposed that the WTO operates on a basis of consensus, with equal decision-making power for all. In practice, a large number of significant decisions are made whereby poorer countries' negotiators are ignored and not even invited to close door meetings. Consequently, the less rich countries had been ignorant of the 'agreements' discussed and announced. Many countries do not have a sufficient number of trade personnel to participate in all the negotiations nor to have a permanent representative at the WTO. As a result, the poorer countries are heavily disadvantaged from presenting their interests. Likewise, many countries are not strong or rich enough to defend and protect themselves from the challenges of the WTO raised by the rich countries, and change their laws rather than pay for their own deface.

ix. The WTO's Rejection of Local Level Decision-Making and National Control

The WTO's 'most favored nation' provision requires equality between countries, in other words, all WTO member countries interact and cooperate equally regardless of their track record. WTO considers any local policies that aim at rewarding companies that hire local residents, use domestic materials, or adopt environmentally sound practices illegal. Strangely, developing countries are not allowed to issue local laws that have been adopted by developed countries, such as protecting new domestic industries until they can be internationally competitive. Gray Davis, California Governor, stood against 'Buy California' project which would have granted a small preference to local businesses. His rejection was because this project was WTO illegal. In addition, conformance to the WTO entailed rewriting entire sections of US laws. What is more interesting is that a number of countries are changing their laws and constitutions with the potential of aspiration of future WTO rulings and negotiations.

x. The Presence of WTO Substitutes

Civil society organizations or non-governmental organizations (NGOs) have developed alternatives to the corporate-dominated system of global economic governance. Together, these organizations meant to build a nurturing, democratic political space to serve global economy, promote jobs, protect and guarantee right to food, water, education, and health care, promote freedom and security, and finally to preserve the world's shared environment for future generations.

4.6 Economic Theory and the Interpretation of WTO

Given the significant influence of rule based multilateral trade regime in the world economy, it is of special importance to assess the importance. For that Bagwell and Staiger (2003) have made an assessment in providing a theoretical interpretation. Their interpretation cuts across two fields of Economics. The first is international trade. In this field, there is the famous result that unilateral free trade is optimal, whenever a government maximizes national income and presides over a small country. For an economist seeking a theoretical interpretation of WTO, this result is initially discouraging. Apparently, in some circumstances, governments have no reason to pursue reciprocal tariff liberalization through WTO negotiations, since each already has the unilateral incentive to eliminate its own tariff. But in fact this result has important constructive value. It suggests that a trade agreement might solve a problem that arises because the negotiating governments (i) have political motivations and do not maximize national income, or (ii) preside over large countries.

Of course, there is little doubt that real-world governments have political motivations. Actual governments are interested not just in the size of national income but also in its distribution. As a consequence, the optimal unilateral policy for a government with political motivations may not be free trade. A positive tariff, for example, may be the means through which such a government steers surplus toward its import-competing firms. But it is quite another matter to say that political considerations constitute a problem that two governments might solve with a trade agreement. As in the leading political-economy models of trade policy, if the negotiating governments preside over small countries, then the governments can do no better with a trade agreement than without one. In these models, at least, politics itself fails to explain the appeal of a trade agreement.

The other possibility is that governments preside over large countries. In a standard general-equilibrium model of trade in two goods, a country is said to be large if a change in its trade policy alters the terms on the world market at which its export good is traded for its import good. For example, if the government of a large country were to depart from free trade and select a positive import tariff, then the import good would become more plentiful on the world market, and so the world price of this good would drop. The government has then engineered a terms-of-trade gain for its country: a unit of its export good can be exchanged on world markets for a greater volume of its import good. By the same logic, the trading partner then experiences a terms-of-trade loss. Since a government does not internalize the terms-of-trade externality that its import tariff imposes upon its trading partner, the optimal unilateral tariff for a national income maximizing government of a large country is positive. If both governments behave this way and set positive import tariffs, a Prisoners' Dilemma situation is created. In the Nash equilibrium, tariffs are too high and trade volumes are too low; hence, a trade agreement that facilitates a reciprocal reduction in tariffs could be mutually beneficial.

Governments of large countries thus may gain from a trade agreement. This insight is hardly new. The terms-of-trade theory of trade agreements was identified by Mill (1844) and Torrens (1844), and Johnson (1953-54) provides a famous and elegant formalization. Nevertheless, many trade economists have objected to this theory as a foundation from which to interpret actual trade agreements. One objection is that this theory leaves out the important political constraints under which real-world government's labor. A second objection is simply that real-world governments just

don't think this way. It is difficult, for example, to find any mention of the "terms of trade" in actual policy disputes. These objections are less worrisome than they might initially appear. The terms-of-trade theory is easily generalized to include political considerations, and it may be directly interpreted in the context of the market-access language that trade policy negotiators use.

This theoretical perspective offers a means by which to interpret the rules of WTO. For instance, it suggests that a government may hesitate to liberalize unilaterally, since it does not want to face the terms-of-trade loss that such behavior would imply. If the governments were to liberalize reciprocally, however, then the terms of trade could be preserved, and the impediment to liberalization thereby would be removed. An interpretation of reciprocity is thereby facilitated.

Likewise, a government would hesitate to liberalize as part of a reciprocal negotiation, if it were concerned that it's negotiating partner might later "cheat" and raise its tariff. It is argued that the WTO enforcement provisions can be interpreted in this light.

The second field to which this study is Applied Game Theory. Within this field, there is a rich theoretical literature that examines how players that interact repeatedly might construct self-enforcing agreements, so as to overcome a Prisoners' Dilemma problem and achieve a more efficient outcome. The theory of collusion among firms, for example, falls into this category. As there are no WTO police, agreements between governments achieved through WTO negotiations must be self-enforcing. Indeed, the rules of WTO may be interpreted as a codification of super game strategies.

4.7 Developed Countries' Compliance to WTO: Opportunities and Challenges for Developing and LDCs

The correlation between openness and international trade has triggered a debate as to whether economic openness in the WTO regime provides better access to trade potentials for the developing and low income countries and hence promotes their growth outcome. On one side of the debate are advocates of free trade who argue that countries perform better with outward orientation than with import substitution policy. They see openness to trade helps countries utilize their resources better in several ways. First, trade allows a country to specialize in the productive activities that it does relatively better than other countries, and thus exploit comparative advantage. Second, trade extends the market facing local producers, allowing them to better exploit economies of scale, which increases income levels and the efficiency of resource allocation. The argument of this school of thought has also been supported by a series of important investigations in the 1970s, which demonstrated the high cost of protectionism in developing countries (Little, Scitovsky, and Scott, 1970). They set in motion a major rethinking of the role of trade in development. The idea that trade can become an engine of growth was accentuated by the success of a growing number of developing countries, primarily in East Asia, in using exports to promote sustained growth and industrial transformation. Looking at the Asian economies that have recorded the most impressive economic performance during the past decades, it is impossible not to notice the connection between strong export orientation and periods of rapid growth and development. In most cases, high and sustained economic growth was preceded by shifts from traditional import substitution to more export-oriented and outward-looking policies, resulting in export growth rates reaching 20 per cent per year (or more) over extended periods of time (WTO, 2003).

On the other side, there are also a number of advocates who take a more skeptical view of the evidence on the relationship between openness and trade growth. Liberalization of the economy under WTO framework, however has created opportunities for developing and LDCs to access more easily developed country markets, there has been increased concerns about the impact of many crucial measures which are not explicitly trade related (Henson, Loader, Swinbank and Bredahl, 2000). For example, developing and low income countries, in WTO framework, have to face revenue loss due to reduced tariffs regime, which brings about an important implication as the government these countries' revenue have hugely been supported by custom duties. Likewise, as tariffs have declined, the importance of non-tariff barriers has increased, due to some proliferation in this area as well as wider recognition of the trade impact of existing measures. More recent efforts to regulate such measures have resulted in WTO Agreements are the SPS compliances as technical barriers to trade. Such systems impose a huge cost in order to meet these compliance conformities on these countries, and also involve regulatory measures, policy re-orientation, and development of the necessary infrastructure, reorganization of the supply chain, enhanced capacity building and a forward looking strategy, particularly for exports, which involve costs for the exporting countries.

4.7.1 Trade Openness: Opportunities to Developing and LDCs

When developed country tariffs have been substantially reduced in the post-war period after successive rounds of multilateral trade negotiations under the GATT at the conclusion of the Kennedy Round of trade negotiations in 1967, the trade of some developing countries quickly expanded (Romalis, 2006). Many studies show that trade liberalization by a large trading partner causes an expansion in the trade of other countries. The WTO provision of General System of Tariff Preferences (GSP) spurred after Marrakesh Agreement of the last Doha Round negotiation has further provided the environment for developing and the least developed countries to substantially get benefits from trade liberalization regime (Panagariya, 2004). Hence, trade expansion of these countries induced by greater market access appears to cause a quantitatively large acceleration in the growth rates of developing country trade to GDP ratios by one third and growth rates by 0.6 to 1.6 percent per annum (Romalis, 2006).

Developed country liberalization may provide useful instruments for developing and low income countries' growth on trade. Since developed country liberalization is a consequence of decisions taken outside of developing countries, it is less susceptible to the endogeneity problems that arise when developing and LDCs themselves liberalize trade as part of a package of reforms. Liberalizations by developed countries may be unaffected by the economic policies of developing and LDCs for most of the postwar period remained on the fringe of world trade negotiations. These liberalizations are arguably exogenous to most developing countries.

The results of many studies suggest that the increase in developing country trade induced by better access to developed country markets could have a meaningful effect on economic outcomes in developing countries - at least for those willing and able to expand their trade. The simple correlation between MFN tariffs and developing country openness suggest that developing country trade responds to market access. Further reductions in tariffs and, more importantly, reductions in the

non-tariff barriers in the WTO framework that routinely afflict developing country exports would almost certainly lead to a substantial increase in the trade of developing countries - a simple policy prescription that help some developing countries grow. Dollar and Kraay (2001) find that more trade promotes growth but has no effect on income distribution; therefore trade increases the incomes of the poor. There appears to have been some conversion of developed country governments towards this view in recent years, at least in relation to the 48 UN-designated LDCs. One move in this direction is the EU's 'Everything but Arms' initiative approved in 2001 (UNCTAD 2001).

An important policy background for the developing and LDCs to be benefitted from the trade liberalization has, in fact, been created in all WTO ministerial conferences with the adoption of the plan of action for these countries. Adaptation of an integrated framework for trade-related assistance to the least-developed countries, provision of market access in product areas of particular concern to developing countries such as agriculture and textiles, provision of additional special and differential treatment provisions in WTO agreements to benefit developing countries, technical assistance to increase the capacity of developing countries to implement WTO obligations and to participate more fully in the WTO are some policy measures to generate trade potential for these countries .

There are three aspects to enhance market access: trade in goods, trade in services and investments. First in the trade in goods, what is wrong with existing GSP is that the list of products has been formulated according to the needs and wishes of the developed countries. Reform of GSP means looking at the needs of the developing countries GSP is indented to benefit: concentrating on reducing trade barriers in those products of particular importance to developing countries and completing reforms begun in the textiles and agricultures.

Second the trade in services includes enhancement of market opportunities for developing countries in service. In the future, there would be great opportunities for export by developing countries such as consulting services for enterprise and tourism, leisure/cultural/sports. It should also afford workers and companies from developing countries the opportunity to collaborate with foreign service industries and to benefit from their technology and expertise. Developing and the LDCs are also designated to differential and more favorable treatment under the general agreement on WTO, however, it was already articulated in the GATT. Because developing countries are disadvantaged in international trade, the international community has agreed that these countries should be subject to somewhat different rules and disciplines in international trade than those that apply to developed countries; and that the latter would implement their obligations under the GATT and WTO in ways that would be favorable to development (Michalopoulos, 2004). Under the terms of the Uruguay Round Agreement on Agriculture, developing economies have provisioned reduced commitments and longer implementation periods than were agreed for developed countries under special and differential treatments framework. Some of the key special provisions explained in IPC (2003), in this regard, can be summarized as follow:

- i. **Market Access**: developing countries' tariff reductions were two-thirds of those for developed countries. Tariffs could be reduced over ten years for developing and the low income countries instead of six years for developed countries. Developing countries were not required to convert their non-tariff barriers on dietary staples into tariffs and were allowed to provide reduced access to those products in their markets.
- ii. Domestic Support: developing countries had to reduce their tradedistorting domestic support by 13 percent instead of 20 percent as required of developed countries. Investment and input subsidies for low-income farmers, as well as subsidies to aid diversification out of narcotics production, were exempt from cuts. The de minimis threshold is 10 percent for product specific and non-product specific support, compared to a 5 percent threshold for each in developed countries. Least developed countries were completely exempt from reduction commitments. Subsidies to the poor consumers and public stockholding for food security purposes were also excluded from disciplines.
- iii. Export Subsidies: Developing country commitments to reduce export subsidy outlays and volumes were reduced. The least developed countries are exempt from making commitments to reduce export subsidies. Some

forms of export subsidies, such as processing, handling and transportation subsidies, used by developing countries were also excluded from reduction commitments. Net food importing developing countries were also exempt from commitments to avoid export restrictions.

iv. SPS Measures: Developing countries can delay implementation of SPS measures, have more time to comply and can request special technical assistance in complying with SPS measures.

LDCs are also benefit from the Integrated Framework (IF) of WTO policy which is an Aid for Trade partnership in action for them. The IF is a multi-donor program, which supports LDCs to be more active players in the global trading system by helping them mainstream trade into national development strategies, set up structures needed to coordinate the delivery of trade-related technical assistance and build capacity to trade, which includes addressing critical supply-side constraints to trade. In this way, the program works towards a wider goal of promoting economic growth and sustainable development and helping to lift more people out of poverty.

WTO rules provide special flexibility to developing countries to take safeguard measures to restrict imports, for temporary periods, in order to promote the development of new or infant industries. This highlights the need for careful analysis of the impact of special safeguards taking into account the potential differentiation between imported and domestic goods. However, safeguard measures can ordinarily be introduced only with WTO approval. These measures are considered important for the developing countries industrial growth and stability because industries in these countries are vulnerable to shocks to international markets. Likewise, consumers in developing countries are also vulnerable to shocks to food prices, given that the poorest people spend as much as three quarters of their incomes on food. To reduce such impacts as safeguard policies these countries may introduce anti dumping laws, subsidies and special countervailing duties to offset the subsidies and emergency measures to limit imports temporarily, designed to safeguard domestic industries. Policy measures that raise the price of products by imposing an import duty may help domestic producers whose incomes have fallen due to economic shocks. If producers are isolated from world markets by poor infrastructure and communications, an even worse possibility emerges in which protection raises the cost of products to poor consumers linked to world markets, while providing little or no benefit to producers in more isolated locations (Hertel, Martin and Leister, 2010).

In the agricultural front, the WTO among some of the multilateral trade regimes is able to provide a unique opportunity for the international community to tackle issues in international trade that cannot be addressed in other forums. For example, concluding the Doha Development Round would address the trade distortions which plague the agriculture sector to the detriment of developing countries, many of which enjoy a comparative advantage in this sector. The millennium development goals also recognize the agricultural sector as an important area where progress towards development can be made. A more open agricultural sector would also allow for the diversification of agricultural production in developing countries. A decision taken by WTO members to provide duty-free and quota-free market access to products from LDCs would be beneficial to those countries.

The agricultural sector has traditionally been a highly protected sector in many countries. While agriculture makes a significant contribution to the economies of a large number of developing countries, many of the world's agricultural producers are disadvantaged in the world trading environment because of high tariff barriers and competition from producers — particularly in developed countries — that receive high levels of domestic or export-related support prior to Doha Round Negotiations. Already before the launching of the Doha Round, WTO members had committed themselves to the long-term objective of establishing a fair and market-oriented trading system for agricultural products. The Doha Round strengthened this resolve by allowing for continued negotiations between members to achieve this objective. In the context of the Doha Round, tariff barriers and trade-distorting domestic support in agriculture have been substantially cut. Furthermore, WTO members have agreed as part of the overall package to eliminate agricultural export subsidies completely.

Important market access opportunities can similarly be expected for developing countries in the nonagricultural area. Trade in industrial products accounts for more than 90 per cent of world trade in goods and encompasses some key products of export interest to many developing countries. Tariffs in developed countries on industrial products are relatively low. However, this average often hides

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remaining high tariffs on products in which developing countries have a particular stake. A reduction in tariffs and non-tariff barriers to industrial trade would thus provide important export possibilities for developing countries. In fact, the mandate for the industrial negotiations specifically calls for the reduction or elimination of trade barriers on products of export interest to developing countries. As with agriculture, LDCs will reap additional benefits in the industrial area from the duty-free and quota-free market access decision (WTO, 2007).

Other elements of the WTO also support the developing and LDCs. WTO members are simultaneously working to bring down other obstacles to merchandise trade. The aim of the Doha Round's trade facilitation negotiations is to improve the efficiency of transactions by expediting the movement, release and clearance of goods across borders, thereby reducing transaction and transit costs that are particularly important for landlocked developing countries, while increasing possibilities for small and medium-sized enterprises to expand and participate more actively in international trade. The Doha Round also encompasses services. Service is the dominant economic activity in virtually all countries of the world and the opening of services trade can provide many opportunities to developing countries. Developing countries have voiced their interest in many services sectors (including professional services, computer and related services, telecommunication services, construction and related engineering services, distribution services, energy services, environmental services, financial services, tourism services and transport services) and in supplying services through the various means identified by the WTO, including through the cross-border supply of services and the temporary movement of professionals across borders. Negotiations are also advancing to provide LDC service providers with preferential market access. Through further market opening in emerging economies, the Doha Development Round negotiations also enhances the potential for South-South trade, with the resulting benefits to developing countries (ibid)

Developing countries have also expressed concern on two possible impacts viz. on the revenue implications of the introduction of the WTO's Agreement on customs and its valuation. The view has been expressed that the shift from "reference prices" to "transaction values" for the determination of tariff payments could lead importers to declare transaction values that are considerably lower than the "real" value of the imported good or the traditional reference price, and that customs administrations, unable to detect or prove false declarations of the transaction value, would be unable to stem the consequent loss in revenue. Empirical evidence to substantiate these claims is not available. In cases where the implementation of the customs valuation agreement implied a shift to transaction values, general reform and modernization of custom administrations were often undertaken in parallel. The impact of the shift to "transaction values" is therefore blurred by the repercussions of other changes. In evaluating the net revenue implications of trade liberalization, at least two crucial features have to be borne in mind: first, trade liberalization which substitutes tariffs for non-tariff barriers (quotas, restrictive licensing requirements, etc.) may have a positive revenue impact. Second, once trade protection is based on tariffs, the revenue implications of reductions in applied rates depend on the price elasticity of imports (Ebrill et al, 1999). This is because price elasticities in open economies have to be much higher than empirically observed elasticities in order for trade liberalization to be self-financing. These findings imply that significant tariff reductions should be accompanied by reform of the general tax system to avoid the emergence of fiscal deficits or curtailment of government expenditure. Empirical evidence on the impact of major trade liberalization programs (which were not exclusively focused on tariff reductions) shows that revenue implications are not necessarily significant (Romali, 2006).

Following this background, a number of studies have already generated the regression estimates on the impact that eliminating existing developed world tariffs would have on the openness and growth of developing countries. When countries lower their barriers to trade, industries and consumers gain access to a whole range of new opportunities. Imports allow domestic consumers to take advantage of a large variety of goods at lower prices. Domestic companies can also take advantage of cheaper imported inputs and some industries seize the opportunity to expand exports to foreign markets. But changes in relative prices brought about by trade liberalization lead to a reshuffling of resources from less competitive import competing sectors to competitive and expanding export sectors. It is these shifts of resources into more productive activities that raise the economy's efficiency and create benefits from trade (WTO, 2003).

4.7.2 Challenges of WTO to Developing and LDCs

With Liberalization, the WTO, as an international framework to promote and enforce the provisions of trade laws and regulations without discrimination has been taken instrumental for developing countries to generate economic growth, reduce poverty, inequality and unemployment, ensure sustainable development, and attain a favorable balance of payment (BoP) in a number of literatures as it facilitates the free flow of resources, market access, rule-based trade practices, and economic efficiency. However, developing and least developed countries have strained in expanding their export prospects. The situation appears particularly serious when one sees it in the context of the current determined efforts of the major developed countries to expand the opportunities for their economic operators in developing countries. The WTO is being used as an important instrument for this purpose as the developed countries have found this institution to be especially effective in pursuing their objectives. In particular, the possibility of retaliation through the operation of the integrated dispute settlement mechanism makes the enforcement of the obligations of developing countries quite effective.

All these trends present new challenges to the developing countries. Particularly, there are four features which enhance their recent and current burden in the WTO compared to what it was a decade ago. First, the subjects and pattern of negotiations have now become much more complex than in the past. For example, the negotiations on the liberalization of financial services or in the various areas of IPRs are really very intricate. Likewise, directly participating in the dispute settlement process either as a complainant or as a defendant has become very complex, because of the intricacies of the legal interpretation which has routinely become a part of the panel or appeal process in the disputes these days.

Second, the role of the developing countries in the WTO negotiations has undergone a significant change. Earlier, they had been negotiating mostly for special concessions and relaxations from the developed countries, whereas now the negotiations are more about extracting concessions from them. It is a much more difficult exercise, as one has to balance the expectations of the demanders with minimum commitments from one's own side.

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Third, the developed countries have started taking up these negotiations with a new determination to expand the access of their economic entities in developing countries. Their attitude and approach appear to have changed in recent years. The old concept of enlightened self-interest in seeing the harmony of their own long-term prospects with the development of developing countries has been replaced by expectations of immediate gains from expansion of current opportunities in the developing countries, irrespective of its effect on the economies of these countries.

Fourth, the developed countries, particularly the major ones, are more coordinated in their objectives and methods in the WTO, whereas the developing countries have been losing whatever solidarity they had in the past. The developed countries are also now moving with a great deal of confidence in themselves. They feel that they can solve their economic problems by proper coordination of policies among themselves; and they do not see the need for support from developing countries in this regard. This has naturally reduced their sensitivity to the problems of developing countries.

Boiling down such challenges for Nepal posed the WTO thus has some far reaching implications for the developing and low income countries like Nepal. The WTO advocates to open the markets within a stringent set of rules of reciprocity on the basis of non discrimination termed as 'the most favored nations' while at the same time it allows of erecting non tariff barriers that prevent access to markets to the products emanating from developing countries. So, developing countries like Nepal can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages only when the products are able to meet the stringent quality standard - the SPS measures - in developed countries' markets. As this quality compliance of exportable commodities involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength. On the other hand, these countries also have to face revenue loss from import due to reduced tariffs regime, as agreed in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries government revenue are hugely supported by import duties. Therefore, a country has to bear the dual costs of compliances. The detail analysis on

the challenges and the impacts associated with the WTO compliances have been presented in Chapter VI and VII.

4.8 Nepal's Accession to the WTO

As a pre-requisite to the accession procedure, Nepal submitted a Memorandum on Foreign Trade Regime to the Working Party in 1998. The WTO Secretariat circulated the Memorandum to WTO members and sought their comments and questions by 15 October 1998. The comments and queries put forward by WTO members regarding Nepal's economic policies, existing laws (including the framework for formulating and enforcing policies affecting foreign trade in goods and services) and trade-related intellectual property rights were forwarded by WTO to Nepal in January 1999. Nepal responded to the queries in two phases during 1999 and 2000.

The first meeting of the Working Party was held on 22 May 2000 in Geneva, resulting in additional queries from WTO member countries. In response to the development of the first Working Party meeting, in July 2000, Nepal submitted schedules of tariff concessions and initial commitments in the services sector. Subsequently, in September 2000, the Nepalese team participated in the second round of negotiations in Geneva with interested member countries on market access, based on Nepal's schedules of tariff concession and initial commitments in the services sector. The latest development, in September 2002, was the second meeting of the Working Party. The meeting reviewed the market access negotiations in goods and services, discussed the legislative action plan and considered the next steps in the work of the Working Party, including the technical assistance needs of Nepal for the purpose of accession to WTO.

Hence, Nepal's entrance in the multilateral trading system since the submission of application to GATT in 1989 as well as the reapplication to WTO in 1995 and especially during the question answer period of 1999 to 2003 brought up a new agenda: What would be the costs of compliance associated with the WTO membership within economic liberalization framework. Nepal, after submitting the application to GATT and thereafter to WTO had enjoyed an observer status till 2004. Nepal submitted the Memorandum of Foreign Trade Regime in 1998, and a working party was formed in 1999 to work out on the requirements for acceding to WTO that conducted a series of meetings (22nd May 2000, 12th September 2002 and 15th

August 2003) and submitted the report addressing goods concession schedule, service schedule, and protocol of accession. Nepal became a member of WTO on 23rd April 2004 as the 147th member after ratification of the terms of accession on 24th March 2004 (Appendix IV).
CHAPTER V

IMPLICATION OF WTO AND TRADE LIBERALIZATION TO NEPALESE TRADE

5.1 Economic Liberalization in Nepal

In the last few decades, developing as well as the least developed countries have experienced extensive and rapid reforms towards trade liberalization, spurred by both multilateral trade negotiation and the conditionality related to Structural Adjustment Programs (SAP) agreed with the Brettonwood Institutions. At the same time, also most of the south Asian countries have opened their trade systems after long protectionist experiences. Liberalization policies have been introduced in these countries with trade liberalization characterized by a rapid elimination of quantitative restrictions, and significant reductions in tariff to low and uniform levels. Multilateral and regional integration have also continued to those countries. However, although most countries undertook trade reforms, the extent and path of reforms was diverse, and in many cases, reforms are still ongoing.

The evolution of Nepal's economic policies have passed through two distinct phases right after the promulgation of democracy in 1951 (the starting point of the systematic planning for development – the Five Year Planning) to now, moving from an increasingly closed, protectionist regime (1956-85) and then towards an open, liberal regime from 1985-86 onward (Sharma, 2000). During the protectionist regime, industrial investment was regulated by means of a rigorous licensing system, domestic industries were protected from foreign competition in the forms of high tariffs and quantitative restrictions and imports of intermediate inputs were subject to import licensing. Further, there were severe restrictions in the use of foreign exchange and the exchange rate was overvalued. These policy-led distortions created a bias against exports leading to a fall in international reserve, a rise in current account deficit and poor productivity performance in manufacturing by the mid 1980s.

Against this background, reforms on economic liberalization were introduced since 1985-86 following outward oriented liberal development strategies. Liberalization was started in two major fronts of the economy. First was gradual liberalization of the foreign trade by dismantling quantitative restrictions and simplifying the industrial licensing regime. Tariffs including sales tax, excise duties and additional duties were gradually reduced and dispersions in tariff rates were narrowed. Bias against exports was reduced through a real devaluation of the rupee and simplification of export procedures. Furthermore, a number of exportable items enjoyed preferential treatment under the generalized GSP scheme. Likewise, the second front was the liberalization of financial sector through the policy reforms. Exchange rate has been made market responsive and commercial banks are allowed to set their own interest rates. The real effective exchange rate (REER) index indicates a real devaluation of the Nepalese rupee from the mid 1980s, although there have been year to year fluctuations.

As an integral part of the economic liberalization, Nepal became the member of the WTO, which has been taken both the opportunity and challenge for the economic growth and hence development of the country. This debate has, in fact, emerged from a distinct stage of development and capacity of the least developed countries like Nepal. As a matter of fact, both arguments have valid backgrounds. On the opportunity side, Nepal can take benefits from the liberalized economy of WTO regime as it has special advantages of market access for the goods and services of comparative and competitive advantages. Nepal, as an LDC can be designated to differential and more favorable treatment under the general agreement on WTO, and the developed countries have agreed that these countries should be subject to somewhat different rules and disciplines in international trade. Under the terms of the Uruguay Round Agreement, developing economies have provisioned reduced commitments and longer implementation periods. Likewise, Nepal can take the benefits of integrated framework regarding the aid for trade and south-south trade potentials. Safeguard measures such as anti-dumping provisions, subsidies and special countervailing duties are also taken advantegous to restrict imports, for temporary periods, in order to promote the development of new and infant industries. On the other hand, agricultural products, which can be the major export products of low income countries like Nepal, would be benefitted from reduced tariff regimes of the developed countries. On the import liberalization front, when countries lower their barriers to trade in WTO framework, industries and consumers gain access to a whole range of new opportunities, which allow consumers to take advantage of a large variety of goods at lower prices.

On the contrary, economic liberalization in WTO regime also poses a number of challenges. However, as an LDC, Nepal is entitled to preferential access to a number of key markets, including the EU, U.S., Japan and others, some of its key exports continue to face tariff barriers from the U.S. GSP scheme and are subject to higher import duties than comparable competitors, including several African, Middle Eastern, Latin American and Caribbean countries. While tariffs remain an issue for some products, non-tariff measures present a greater obstacle to trade expansion (Adhikari and Dahal, 2008). However, agricultural exports to developed-country markets have emerged as a potentially major source of the export growth for Nepalese economy, exploiting this potential embraces many challenges. The capacity of such country exporters to enter these markets depends critically on their ability to meet stringent food safety standards imposed by developed countries. Not only are these standards stringent, but they are increasingly so. They now go well beyond traditional quality standards, as suppliers must pay closer attention to the responsible use of agrochemicals, energy, water and wastes, as well as social and environmental impact (UNCTAD, 2008). Likewise, on the import side, Nepal has to face revenue impact due to reduced tariffs regime in the WTO framework as agreed in non agricultural market access framework of WTO. This implication is very important because, Nepal's custom revenues as many developing and low income countries have been hugely supported by import duties.

In addition, Nepalese economy has been limited by a number of supply-side constraints. Access to credit is extremely limited, especially in rural areas, due to high interest rates, a general lack of lenders and a lack of collateral among borrowers. Costs of doing business are high due to, among other factors, poor infrastructure, and expensive electricity and lengthy administrative procedures. Corruption remains a major concern, compounded by weak regulations and institutions. Technological and human resource capacities are extremely low due in part to limited educational attainment, vocational and technical education and investment in research and development. All these factors have contributed to low productivity rates and have reduced Nepalese exporters' competitiveness in the global market (Adhikari and Dahal, 2008).

5.2 Trade Performance

Despite its significant geographical constraints and policy and institutional weaknesses, Nepal has comparative advantage in a number of labor-intensive manufacturing and agricultural products. However, Nepal's trade performance over recent years has been highly variable, reflecting the formidable constraints to realizing this potential. Even with structural change in its merchandise exports, Nepal remains dependent on a relatively small basket of exports and a few destination markets. A significant share of its exports face dwindling world demand, making the continuing restructuring of its export basket urgent. With regard to trade policy, Nepal has significantly opened up trade in the past decades, a trend that is likely to be reinforced by the implementation of its WTO commitments. In addition, the high transaction

costs associated with formal cross-border trade with India lead to a significant share of that trade occurring through informal channels.

Foreign trade is one of the most important determinants of Nepalese economy as it remains crucial to meet the domestic supply of goods and services on the one hand, and on the other, it provides a significant percent of incomes as trade tax revenues. GoN (2012) states that the ratio of foreign trade as a percentage of GDP in the fiscal year 2010-11 is around 37 percent. The report while examining Nepal's trade performance after Nepal's membership to the WTO in 2004 to 2011, assesses that export performance is not promising as it tended to be stagnant and declined in relative terms from -14.9 percent in 2004-05, the ratio reached -27.7 percent in 2009-10. The average ratios of export and import with GDP in the same period were 12.1 percent and 32.9 percent respectively. Furthermore, the ratio of export to GDP has decreased from 14.6 percent in 2004-05 to 8.7 percent in 2010-11. But the ratio of import to GDP has increased from 29.5 percent in 2004-05 to 37.4 percent in 2009-10. Compared to the average growth rate of total trade at 16.1 percent, the average growth rates of export and import are 1.0 percent and 20.4 percent respectively from 2004-05 to 2010-11 clearly indicating that imports have tended to grow significantly while exports have tended to be static (GoN, 2012).

The share of export in total trade after the accession of Nepal to the WTO has also been found decreased to 14.5 percent in 2010-11 while it was 28.2 percent in 2004-05 (ibid). This has naturally generating trade deficit and thus creating foreign exchange burden to the economy. The import of merely the petroleum products is greater than the total value of all the commodities exported from the country (Shrestha, 2003). Furthermore, Nepalese export trade, is highly concentrated on few items (iron and steel, textiles, woolen carpets, garments, pashmina, tea, coffee and large cardamom) to few markets (India, USA, Bangladesh, Germany, UK, France, Turkey, Canada, Italy, China and Bhutan).

On the other hand Nepal imports many items compared to export products like petroleum products, iron and steel, machinery and parts, transport vehicles and spare parts, electronic and electrical equipments, pharmaceutical products, gold, telecommunication equipments and parts, crude soybean oil, polythene granules, and chemicals from India, China, UAE, Indonesia, Argentina, Thailand, the Republic of Korea, Malaysia, Japan and the USA. Perennially, India is the largest trading partner of Nepal both in terms of export as well as imports as it shares absorbs 67.5 percent of total trade consisting 66.9 percent of total exports and 67.6 percent of total imports (GoN).

Nepal imports mainly petroleum products, machinery, medicines, clinker and cement, high tech products, automobiles, electronic and electrical products, chemicals etc. from India while it exports mainly medicinal herbs and agricultural products, garments, raw skin, some semi processed products, instant noodles, zinc plates, etc. to India. Nepal has signed three separate agreements on trade, transit and control of unauthorized trade between the two countries to promote trade with India. Considering their close political, social and cultural relations, the trade potentiality may be much larger. However, the increasing trade deficit with India that accounts for 56.5 percent of the total trade deficit has created serious problems in the balance of trade of Nepal. Nepal's ever-growing dependence on a single country indicates the urgency for trade diversification and indicates need for strengthening its competitiveness to attain this end. Nepal faces several problems in its foreign trade with third countries mainly due to long transit route, long and complex administrative procedures, SPS and TBT related issues.

5.2.1 Trade Performance in Pre and the Post-liberalization Era

Nepal's international trade has long been dominated by import owing to the balance of trade always in deficit. The trade deficit with India is perennially huge. The table 5.1 indicate that trade deficit growth during the pre-liberalization period was 21.09 percent indicating a highly negative impact on in the balance of payment. The average import growth during this period is found to be 17.56 and the average export growth of the same period is not found to be 16.81. Moreover, the situation in the post-liberalization period is not found to be improved as trade deficit growth during this period was 18.28 percent. The average import growth during this period is found to be 16.41 and the average export growth of the same period is found to be 13.50.

	Rs. in millions (current price) and %					
Fiscal		Тг	ade Volume	and Growth		
Year		% Change in		% Change	Trade	%
	Imports	Import	Export	in Export	Balance	Change
1974-75	1814.60	-	889.60	-	-925.00	-
1975-76	1981.70	9.21	1185.80	33.30	-795.90	-13.96
1976-77	2008.00	1.33	1164.70	-1.78	-843.30	5.96
1977-78	2469.60	22.99	1046.20	-10.17	-1423.40	68.79
1978-79	2884.70	16.81	1296.80	23.95	-1587.90	11.56
1979-80	3480.10	20.64	1150.50	-11.28	-2329.60	46.71
1980-81	4428.20	27.24	1608.70	39.83	-2819.50	21.03
1981-82	4930.30	11.34	1491.50	-7.29	-3438.80	21.96
1982-83	6314.00	28.07	1132.00	-24.10	-5182.00	50.69
1983-84	6514.30	3.17	1703.90	50.52	-4810.40	-7.17
1984-85	7742.10	18.85	2740.60	60.84	-5001.50	3.97
1985-86	9341.20	20.65	3078.10	12.31	-6263.10	25.22
1986-87	10905.20	16.74	2991.40	-2.82	-7913.80	26.36
1987-88	13869.60	27.18	4114.50	37.54	-9755.10	23.27
1988-89	16263.70	17.26	4195.30	1.96	-12068.40	23.71
1989-90	18324.90	12.67	5156.20	22.90	-13168.70	9.12
1990-91	23226.50	26.75	7387.50	43.27	-15839.00	20.28
Average	Percentage	17.56		16.81		21.09
1991-92	31940.00	37.52	13706.50	85.54	-18233.50	15.12
1992-93	39205.60	22.75	17266.50	25.97	-21939.10	20.32
1993-94	51570.80	31.54	19293.40	11.74	-32277.40	47.12
1994-95	63679.50	23.48	17639.20	-8.57	-46040.30	42.64
1995-96	74454.50	16.92	19881.10	12.71	-54573.40	18.53
1996-97	93553.40	25.65	22636.50	13.86	-70916.90	29.95
1997-98	89002.00	-4.87	27513.50	21.54	-61488.50	-13.29
1998-99	87525.30	-1.66	35676.30	29.67	-51849.00	-15.68
1999-00	108504.90	23.97	49822.70	39.65	-58682.20	13.18
2000-01	115687.20	6.62	55654.10	11.70	-60033.10	2.30
2001-02	107388.90	-7.17	46944.80	-15.65	-60444.10	0.68
2002-03	124352.10	15.80	49930.60	6.36	-74421.50	23.12
2003-04	136277.10	9.59	53910.70	7.97	-82366.40	10.68
2004-05	149473.60	9.68	58705.70	8.89	-90767.90	10.20
2005-06	173780.30	16.26	60234.10	2.60	-113546.20	25.10
2006-07	194694.60	12.03	59383.10	-1.41	-135311.50	19.17
2007-08	221937.70	13.99	59266.50	-0.20	-162671.20	20.22
2008-09	284469.60	28.18	67697.50	14.23	-216772.10	33.26
2009-10	374335.20	31.59	60824.00	-10.15	-313511.20	44.63
2010-11	396175.50	5.83	64338.50	5.78	-331837.00	5.85
Average	Percentage	15.89		13.11		17.65

 Table 5.1: Foreign Trade Direction of Nepal

Source: Economic Survey (Various Years)

The figures presented in the table 5.1 can also be shown in the graphical explanation that is presented in figure 5.1.



Figure 5.1: Foreign Trade Direction of Nepal

It is, however, noteworthy to examine that the nature of the trade was dichotomous- more or less free with India and controlled with the rest of the world in that period. The situation became even worse as trade deficit is being widened in the those years with the implementation of trade liberalization measures such as devaluation and introduction of flexibility in the exchange rate, elimination of import license and quotas, rationalization of the tariff structure, reduction in the average level of tariffs, implementation of full convertibility of the rupee in the current account, liberalization of foreign investments, privatization and institutional reform of state-owned enterprises, market-based pricing of agricultural inputs and outputs, and reduction of subsidies on credit and irrigation.

Even after 1990 or in the post-liberalization period (time series of 1991-92 to 2010-11 in this study) with liberal economic regime, Nepal's trade liberalization could not bring about a significant change in the trade sector. The trade deficit growth during this period was marginally to 18.3 percent indicating again a highly negative impact on in the balance of payment. The average import growth during this period is found to be 16.4 and the average export growth of the same period is found to be 13.5.

5.2.2 Nepal's Export Performance

Despite significant structural changes in Nepal's merchandise exports over the last two decades, like other South Asian countries, Nepal remains dependent on a few markets and relatively few exports. This has made it vulnerable to external shocks arising from demand and policy changes in destinations. Regarding internal factors, Nepal's export performance is also affected by its limited competitiveness. The destination of Nepal's exports and the sources of its imports are limited to a few countries. Within manufacturing, Nepal's export basket is narrowly concentrated in a few products: garments, carpets, and Pashmina. Furthermore, they depend on limited external markets and Nepal's increased dependence on India has elevated risks arising from Indian policy shifts. Carpets are exported primarily to Germany and garments to the U.S. The importance of trade for growth and the nature of Nepal's exports (laborintensive manufacturing and diversified agriculture) mean that trade is critical for poverty reduction.

However, manufacturing now dominates Nepal's exports, though, in a welcome development, growth of agricultural products has occurred in recent years. In a break with past performance, agricultural exports grew substantially since 1990. Nepal's comparative advantage in agricultural sectors extend to a variety products to which export potential appears highest for cardamom, tea, pulses, cut flowers, leather, ginger, coffee , medicinal plants and essential oils, honey, and mandarin oranges, including medicinal herbs and aromatics. Yet, value added in this sector currently accounts very small to the GDP. Comparative advantage extends to a range of other areas: honey, horticulture products, livestock, fisheries products, fiber, and off-season vegetables.

Among agricultural products the export potential appears highest for tea all in terms of employment generation, revenue collection, and socioeconomic sustenance. The tea processing industry is seen as a potential growth industry and an important channel for reducing poverty due to strong linkages to rural communities. It also serves as an illustration of the issues facing commercial and estate farming. Large areas of Nepal are suitable for tea plantations, and global demand for niche teas, such as orthodox tea, continues to grow. Export quantities are small (less than 1,000 tons compared to more than 1.3 million tons of total world exports). As the Nepal industry is relatively young, the quality of tea trees is regarded as high, compared to those in India leading many to consider tea to be a potentially important export.

This study, for these all reason why, has taken tea products as a case study to study the compliance cost and its impact on Nepalese exports.

5.2.3 Introduction to Tea Production and Processing

Tea (*Camellia Sinensis*) comes from an evergreen bush, which grows at a fairly high altitude. Tea bushes mature for commercial exploitation 5 to 7 years after being planted and can remain productive for over 100 years. Tea grows in tropical and subtropical regions of the world. Tea production originated in Southeast China more than three thousand years ago and spread widely over the world especially in Asia and Africa. First, to countries in Asia, such as Vietnam, Japan, Bangladesh and Taiwan. Later, from the 19th century on, tea was introduced by the British in India, Sri Lanka, and by the Dutch in Indonesia. Commercial production in Africa started in former British colonies such as Kenya, Tanzania and Malawi well into the 20th century.

Production of green leaf, the term used for fresh unprocessed tea leaves, is labor intensive. Planting, pruning and most of the picking (plucking) is done manually. In many areas, tea can be picked all year round. The fresh leaves or flushes - 'two leaves and a bud' for high quality tea - of the tea bush are plucked and collected into baskets or bags which the pickers, often women, carry on their backs. Full baskets are taken to collection points where they are weighed. The collected tea is then transported rapidly to a nearby processing plant, which in the case of large estates is usually located on the premises. To prevent loss of quality, green leaf must be processed as soon as possible and in any case within 12 hours after harvesting. The types of teas are distinguished by the processing they undergo. The two main types are black, or fully fermented tea and green tea which is unfermented. Green tea accounts for only about 27 and 7 percent of world global production (Wal, 2008) and trade respectively while black tea accounts for almost all of the rest4. Other types of tea are oolong and post-fermented (Puerh) tea which are produced mainly in China and represent only 6 percent of global production. And there is white tea which is produced in only minute quantities.

Tea processing involves the drying and crushing of leaves. This leads to controlled fermentation (enzymatic oxidation) of the liquor present. There are two main methods of black tea production orthodox and CTC (crushed -torn-curled or also referred to as cut-torn-curled). Both largely mechanised processes, involve withering (reducing moisture), rolling, oxidation and drying. In the CTC process however leaves are cut and rolled in several, special ways. Both orthodox and CTC teas come in different grades (qualities) that are based on the size of the processed and dried leaves, which is determined by their ability to fall through screens of specific meshes (ITC, 2007). In general CTC grades are more granulated or powder-like in appearance and orthodox tea looks more like twisted flakes or longer leaf (particles). CTC gives a higher 'cuppage' (almost twice) for the same quantity of tea, and therefore a stronger liquor. Orthodox tea is lighter and retains more (distinct) aroma. In green tea production the natural fermentation process is halted by first drying (heating or steaming) the freshly picked leaves before further processing (rolling, drying). Tea quality and price are determined on the basis of liquor, aroma/ flavor and leaf appearance (grades). The processed factory tea (referred to as "made tea" in the industry) is sold in packets and chests.

Global tea production reached 3.5 million tons in 2006. While tea is produced in more than 35 countries, only a handful - China, India, Sri Lanka and Kenya – are responsible for almost three-quarters of production. More than half of the world's tea is produced in China and India alone. Worldwide, the sector provides employment to millions of people. Tea production and export is a vital part of the economy for producing countries in terms of employment in remote and poor rural areas. However, for countries such as Kenya and Sri Lanka which export most of the tea they produce, and which together control 40 percent of world exports, tea trade is also important within the economy as a whole. Almost 56 percent of all tea produced worldwide is consumed locally. And while world tea production doubled over the past 3 decades, demand is lagging behind, creating a situation of oversupply (Wal, 2008).

While tea is traditionally a product from large plantations, also known as estates, smallholders are becoming increasingly important in the industry as well. In Sri Lanka and Kenya for example they are responsible for about 65 and 62 percent of total production respectively (Kustani and Widiyanti, 2007). In these countries they have received considerable government support. The cultivation of tea is attractive to small farmers because tea provides work and income throughout the year, requires relatively little investment, and the risk of complete crop failure is small.

5.2.3.1 A Brief History of Tea Production in Nepal

Nepal's first tea plantation, the Ilam Tea Estate, was established at an elevation of 4,500-5,000 feet within 10 years of the first Darjeeling tea plantations (about 1863). It is believed that the first bushes were grown from seeds given as a gift from the Chinese Emperor to the then Prime Minister of Nepal, Junga Bahadur Rana. Two years later the Soktim Tea Estate was established. However, Nepal's early tea industry failed to grow, unable even to meet local demand, while the Darjeeling tea industry thrived.

In 1966 the Nepal Tea Development Corporation (NTDC), formerly a government organization and now privatized, was formed to support development of Nepal's tea industry. Initially most of Nepal's quality tea leaves were sold to Darjeeling factories for processing, thus shoring up India's tea industry, which was seeing quality declines partly due to Darjeeling's aging tea bushes. In 1978 the first Nepali tea processing factory was built in Ilam, followed by establishment of another factory in Soktim. Privatization of the NTDC signaled a shift in tea production and marketing policy, leading to privatization of the entire tea sector. Regulatory functions and policy development were given to the government. From the late 1970s through 1990, efforts were made to facilitate growth and production of tea as a cash crop by small holder farmers to supplement tea grown on larger estates and plantations. In 1982 the five districts of Nepal's eastern region – Jhapa, Ilam, Panchthar, Tehrathum and Dhankuta – were declared a Tea Zone by the government

5.2.3.2 Orthodox Tea

Two major types of tea are produced in Nepal; CTC (cut/tear/curl) and orthodox. CTC tea is produced in the warm and humid Terai, primarily in Jhapa, and is the predominant type of tea consumed domestically. Domestic sales account for about 90 per cent of Nepal's CTC tea production. In 2003/2004, an additional 2.5 million kg of CTC tea was sold to India and Pakistan. Orthodox tea, also called hill tea, is grown at elevations ranging from 3,000-7,000 feet, primarily in the eastern hills of Nepal.

Orthodox tea is known for its aroma, bright liquor and subtle, slightly fruity flavor. These qualities make it attractive as an export tea, with more than 90 per cent of orthodox tea exported, primarily to India, and to a growing market in Germany. Nevertheless, this accounts for only 0.2 per cent of the world's tea exports. Consistent with the Nepal Tea Policy goal of creating increased, enhanced opportunities for export and income generation from foreign currencies, the government has focused on expanding and improving production of orthodox tea. As a nationally targeted economic sector, orthodox tea has received attention also by SNV Nepal, other INGOs and donor-funded projects.

Soil, topography, climate conditions and weather patterns of eastern Nepal are conducive to orthodox tea production. Long days of sunshine, complemented by plentiful rainfall and gently sloping topography, create ideal growing conditions for orthodox tea. The soils are consistent with needs of tea bushes, being slightly acidic with pH values ranging from 4.5-5.5, having sufficient organic matter and good water-holding capacity, and a depth of at least one meter. The hilly terrain aids good drainage. Additionally, the undulating topography and barren areas are more appropriate for tea production than for other crops. Because tea bush roots are deep and hardy, they can penetrate the varied soil strata. Thus, tea bushes can survive and also aid in reducing erosion of these otherwise unstable slopes. Cold winter temperatures cause tea bushes to grow slowly, allowing flavor to develop fully and resulting in quality tea leaves. Although a limited amount of tea is harvested from relatively young bushes, tea bushes mature only after seven to 10 years of growth. Most of Nepal's tea bushes are much younger and healthier than those of the longestablished plantations in India.

5.2.3.3 Performance of Tea Sector in Nepalese Economy

The export performance of tea seems to strong compare to other agricultural exportable products. Nepal produces both CTC (lowland) tea, primarily for domestic consumption, and highland orthodox tea for export. The tea sector experienced significant growth, following its liberalization over two decades ago. From an average of 72.2mt exports worth equal to Rs. 13574 thousands in 1994-95 grew to over 8889mt equivalent to Rs. 1160593 thousands in 2008-09. The tea industry has been expanding in recent years along with an expansion of its plantation areas from

3,501.800 hectares in 1996 to 15,000 hectares in 2004. There is large potential to expand the cultivated area. With the positive conditions in this sector, the government has set very ambitious production targets (ITC, 2007). However, the tea sector is unlikely to meet the targets, mainly due to problems relating to the political instability, the fragmentation of production, and the lack of auctioning facility or quarantine laboratory. The world market, at the same time, is showing its first sign of price recovery since its slump caused by massive overproduction (ibid). CTC tea is mostly consumed within Nepal whereas more than 95 percent of orthodox tea is exported to Germany, Japan, the US and other developed countries. Both orthodox and CTC industries have undergone large expansion during the last decade. The south-eastern plains of Jhapa alone produce all of the domestically produced CTC tea consumed in Nepal. While small farmers form the backbone of orthodox tea, the production of CTC tea is largely controlled by big tea estates. Overall, Nepal has favorable market access conditions to the most attractive markets including Japan, US, EU and Russia. Its production of tea is, however, rather specialized in niche markets such as highland orthodox tea and high quality and organic.

Until 2003, the volume of tea exported annually from Nepal was around 80-100 tons, after which the tea sector saw an exponential rise in exports of more than a thousand percent, largely as a result of liberalization carried out ten years earlier. However, the value of tea per ton was more or less constant until 2002 when it started to decline. If one calculates from the figures below, the value per ton in 2002 was \$ 4487.5 whereas in 2004, it had declined to only \$ 1206 per ton. Over the last 10 years, Nepal has become increasingly self reliant on tea and import of CTC has decreased substantially. Initially the import of CTC was meant to cover domestic demand, but has now has been substituted by domestic production. Compared to the value of exported tea the value of imported tea has decreased in the beginning of the 2000, but then recovered in 2004 (SAWTEE, 2006).

The economic liberalization has experienced to bring about some noticeable changes in the tea sector. Currently, there are an estimated 136 large tea plantations, which accounts for 70% of land used for growing tea. Small farmers, who mainly live in the hills and produce orthodox tea, cultivate the remaining 30% of land. Most of the tea is consumed domestically with around 25 % being exported. Nepal currently aims at increasing the production and export of green tea, which is non-fermented and linked to health benefit. With a view at increasing production, new districts like Kaski, Dolakha, Sindhupalchowk, Solu, and Nuwakot have become involved in tea

production. The total value of tea in 2001 was \$ 2215/ton, which decreased to \$1165/ton in 2003, but rose to \$ 2412/ton in 2004. Therefore, in 2004 Nepal paid more than twice as much per tons for its imported CTC tea to cover domestic consumption than it received for its exported CTC surplus production (ibid).

The following table 5.1.1 shows the plantation of tea during the period of 1992-93 to 2008-09. The figures, however, are not distinguished of tea plantation area whether they are of CTC and orthodox. There seems also an inconsistency in time series data as there is not the figure of both the private sectors' and Nepal Tea Development Corporation (NTDC) tea plantation area up to 1995- 96. Again the plantation area of NTDC during the period of 2000-01 to 2004-05 is not available.

Years	Private	NTDC	Small Holders		Total
			Farmers	Area	
1992/93	-	-			
1993/94	-	-	1191	493	
1994/95	-	-	1788	644	
1995/96	-	-	2243	828	
1996/97	1685.2	937.6	2390	829	3501.8
1997/98	2192	937.6	2546	1385.4	4515
1998/99	6073.2	937.6	2860	2050	9060.8
1999/2000	6073.2	937.6	4915	3239	10249.6
2000/2001	8179	-	5310	3818	11997
2001/02	8179	-	5575	4186	12346
2002/03	8321	-	4314	12647	12643
2003/04	8869	-	6252	6143	15012
2004/05	8912	-	6854	6989	15900
2005/06	8911	7154	7100	16012	8443907
2006/07	9011	-	7593	7409	16420
2007/08	9030	-	7791	7564	16594
2008/09	9063		8184	7655	16718

Table 5.1.1: Tea Plantation in Hectare

Source: National Tea and Coffee Development Board, 2011

The area of tea plantation in Nepal, which is shown in the table 5.1.1 can also be presented in the figure 5.1.1, where the plantation are for the NTDC is taken as of fiscal year 2005-06 as the NTDC did not want to disclose the data after that period.



Figure 5.1.1: Tea Plantation in Hectare

Likewise, with regard to the production of tea, the table 5.2.2 shows the production of tea during 1992-93 to 2008-09. The figures, however, are not distinguished whether they are CTC and orthodox tea. There seems also an inconsistency in time series data as there is not the production figure of Nepal Tea Development Corporation (NTDC) during 2001-02 to 2008-09. Here is interesting to note that NTDC was privatized in 2001 and from the same period there seems the lack of data to the public. The researcher tried his best to find this production figure, but the authority of NTDC continuously decline to disclose the data except the verbal information of 2010 production figure.

				Production in kg
Year	Private	NTDC	Small Holder	Total
1992/93	754000	860000	-	1614000
1993/94	687000	982000	7500	1744000
1994/95	837000	109403	100000	1946403
1995/96	1500000	1112329	125000	2737329
1996/97	180000	925942	180000	2905942
1997/98	1946455	603136	468980	3018571
1998/99	3777857	796881	418242	4492980

Table 5.1.2: Producers' Share in Tea Production

1999/2000	3577857	496881	1010499	5085237
2000/2001	5189579	-	1448503	6638082
2001/02	5864720	-	1653855	7518575
2002/03	6478000	-	1720000	8198000
2003/04	7714669	-	3956535	11651204
2004/05	7789893	-	4816188	12606081
2005/06		5244330	13688237	
2006/07	9340754	-	5826989	15167743
2007/08	9940311	-	6187179	16127490
2008/09	999013	-	6218114	16208127

Source: National Tea and Coffee Development Board, 2011

The producers share in tea production in Nepal, which is shown in the table 5.1.2 can also be presented in the figure 5.1.2, where the production share are for the NTDC is taken as of fiscal year 2005-06 as the NTDC did not want to disclose the data after that period.



Figure 5.1.2: Producers' Share in Tea Production

The current socio-economic impact in terms of employment is high. The job creation impact of this sector is very high compared to other sectors. This sector seems to be a strong engine for farmer's income generation and poverty reduction as orthodox Tea gives higher returns compared to other crops. This sector is also likely to have a high impact on employment compared to other sectors especially female employment.

In regard to the tea plantation and production, there are five district of eastern Nepal Viz; Jhapa, Ilam, Pachthar, Terahthum, and Dhankuta which have a significant dominance in the area of tea plantation and production compared to other districts/areas of the country as shown in the table 5.1.3. The following table shows that these five districts have accounted 89.41 percent of plantation area compared to 10.59 percent to other districts/areas. Likewise, in regard to the production, these five districts have figured 99.46 percent as compared to very negligible 0.54 percent to other districts/areas.

Districts	Garden		Small Farmers			Total	
	Plantati on Area- ha	Productio n kg	No. of Small Farmer s	Plantati on Area-ha	Productio n kg	Plantatio n Area- ha	Productio n kg
Jhapa	6107	9294867	954	2981	4823783	9088	14118650
Ilam	1347	493985	5007	3794	1102910	5141	1596895
Panchathar	382	89950	917	456	1400999	838	230949
Dhankuta	230	50340	422	212	73351	442	123691
Terathum	37	5595	525	207	40893	244	46488
Others	960	55276	359	5	36178	965	91454
Total	9063	9990013	8184	7655	6218114	16718	16208127

 Table 5.1.3: Tea Plantation and Production (Upto 2008-09)

Source: National Tea and Coffee Development Board, 2011

The area of tea plantation in Nepal, which is shown in the table 5.1.3 can also be presented in the figure 5.1.3(a) and 5.1.3(b), where tea plantation and production in the different districts of Nepal.



Figure 5.1.3(a): Tea Plantation Area (in Hactare)





From a poverty-reduction point of view, it is important to note that the growth in area used for tea production has been spurred by the participation of small holders. Their share of the total land used has grown from 20% of the total in 1994/1995 to 41% in 2003/2004 (SAWTEE, 2006). A large number of farmers are attracted by this cash crop and given up traditional farming (when they used to grow multiple crops for their own consumption) to specialize in growing tea alone and using the profits to buy the essential food grains. As such, districts like Ilam and Panchthar, where the participation of the small farmers in cash crop is noteworthy, have come to be seen as trendsetters to farmers in other similar locations in the country, primarily because

specialization in one crop has proven to increase the overall yield and promote commerce in agriculture outputs. The popularity of cash crops has, in turn, helped reduce poverty rates among small farmers in the tea growing regions.

		Orthodox		C.T.C		Total	
SN	Particulars	Plantation	Production	Plantation	Production	plantation	Production
		Area-ha	kg	Area-ha	kg	Area-ha	kg
1.	Garden	2956	695146	6107	9294867	9063	9990013
2.	Small	4664	1384331	2981	4823783	7655	6218114
	Farmers						
	Total	7620	2079477	9088	14118650	16718	16208127

 Table 5.1.4: Tea Plantation Area and Production 2006-07

Source: National Tea and Coffee Development Board, 2011

The above table shows the tea plantation area and production of orthodox and CTC tea on the basis of scale of production and holdings in 2006-07. In this regard, large sizes of tea estate/garden have dominance both on the area of plantation and production of the CTC tea while small farmers have dominance both on the area of plantation and production of the orthodox tea. Large tea estate/garden are found to cover 38.79 percent plantation area and produce 33.43 percentage of orthodox tea and 67.20 percent plantation area and 65.83 of CTC tea. Similarly, large size garden share 54.21 percent in aggregates of plantation area of both for orthodox and CTC tea and produce 61.64 percent output. Similarly, small farmers are found to cover 61.61 percent plantation area and produce 66.57 percent of orthodox tea and 32.80 percent plantation area of both for orthodox and CTC tea and produce that of 38.36percent output.

5.2.3.4 Export Performance in Tea

Over the last decade, key features of the tea market have been low prices, oversupply and in turn, fierce competition. The fall in prices was mainly caused by high world production due to the expansion of the area under cultivation and exports. Major tea producers such as Bangladesh, Kenya, Malawi and Tanzania expanded their tea production area by more than 130,000 hectares in the first half of the 1990s. Prices were also depressed because of the presence of low quality tea on the market as well as competition from other drinks (ICT, 2007). Tea experts are calling for strict quality control standards to reduce the effect of low quality teas on the market. To counter the trend of tea losing ground to soft drinks, the tea industry is actively trying to promote consumption in the EU and the US by emphasizing the health benefits of drinking tea compared to coffee. The promotion of ready-to-drink tea is also being explored as it can compete with soft drinks.

After some signs of recovery in 2004, the FAO composite price for tea declined by 1.2% to an average of USD 1.64 a kg in 2005. Some improvement in demand eased supply pressure on prices at the start of 2006 when the composite price peaked at USD 1.92 a kg in February. After some corrections during the middle of the year, prices strengthened due to weather induced reductions in supplies in Kenya. (Public Ledger Dec 18, 2006.) China, Sri Lanka, Kenya, India and Turkey are the largest producers. India and China are at the same time very large consumers. Sri Lanka is the world's largest tea exporter with a 21 percent global export market share. Kenya, which produces mainly cut, tear, and curl (CTC) tea—used primarily in tea bags—has a similar market share. About 44% of world production is CTC tea and 31% Orthodox tea, with green tea making up the balance (ibid).

On the demand side Russia is the major market followed by the United Kingdom, Pakistan, the United States, Japan and Germany. Tastes vary significantly around the globe. Russian tea drinkers have a distinct preference for black tea. While the Russian market was initially dominated by Orthodox tea, the Orthodox tea is shifted to CTC on prices considerations. Recently, the trend has changed again with CTC demand steadily falling and Orthodox tea re-emerging as the preferred variety. The price paid for tea also varies greatly. Germany and Japan prefer First Flush Darjeeling, at more than USD 30 per kg, while consumers in the UK appear reluctant to pay even USD 2.50 for top quality Kenyan tea. Consumer tastes differ not only with regard to quality and origin: continental Europe buys leafy orthodox teas, while the UK prefers CTC's more suitable for tea bags. Average CIF import prices vary significantly between countries, from USD per 3/kg in Russia (for black tea in packages of less than 3kgs) to USD 12/kg in Norway and 13/kg in Finland, demonstrating that there is significant scope for value addition (AEC, 2002). Orthodox teas can be sold at a better price, especially when marketed well, as has been done by India with its Darjeeling teas. However, it is difficult to determine exactly where the markets for orthodox tea are and how they are performing. Organic certification and other teas focusing on high quality are further differentiating factors.

Nepal's market access conditions to all markets, especially in market openness, are very favorable, but Nepal does not have any tariff advantages. Nepal enjoys free access in the major markets, with the exception of Russia that imposes a very high conditional tariff of 20%, with a minimum payment of 0.8 Euros per kilogram. Major OECD countries, Russia, and Syria are the most attractive markets for Nepalese orthodox tea. Nepalese tea is highly underrepresented in most of the attractive markets. Syria, US, and UK show much higher growth than the world growth, implying highly dynamic markets (ITC, 2007). At the regional level, India is a very attractive market for Nepalese tea, especially, owing to high tariff advantages as opposed to its competitors.

However, Nepal's export in terms of tea has long been negatively impacted by a poor duty drawback scheme. The poor performance of the scheme (as many countries provide various import-duty exemption schemes to exporters, since sourcing materials at international prices is considered essential for exporters to remain internationally competitive. Duty exemption schemes may include duty-drawback facilities or duty suspension schemes or a straight duty exemption to exporters) has turned out to be costly for many exporters. This has happened for two reasons. First, the procedures to obtain duty rebates are cumbersome. They require substantial amount of documentation and involve several departments and ministries. Second, exporters complain of lengthy delays in rebates and some have not received their entitlements for almost four years.

The prospect, notwithstanding, for orthodox tea exports to the EU are promising provided adequate attention is given to adopting good practices to manage pesticide residues within permissible limits. In this regard, Nepalese tea in terms of standard in quality is supposed stricter than the Indian standard in terms of extract by boiling tea and crude fiber. While the Indian standard includes pectinase enzyme, Nepal's standard includes caffeine. The Indian standard also contains limits for lead, copper and arsenic (Karki, 2007).

Despite the relatively positive growth figures Nepal's tea export is still very small and only makes up 0.2% of the world's total tea export. According to WTO/UNCTAD's COMTRADE figures from 2004, Nepal traded 3597 tons of black and green tea, 3481 tons of black (fermented) tea and 116 tons of green tea. The following table provides an overview of Nepal's total orthodox tea export in during the period of 1994-95 to 2008-09. According to NTDC Nepal exported 72.2 MT of

orthodox tea while figure was scaled up to 8889 MT in 2008-09. However, there is not clear division in the series of the CTC and orthodox tea. Moreover, the researcher himself found 2600 thousand k. g. of orthodox tea in international markets.

The export of Nepalese orthodox tea, from the following table 5.2.5 shows that has covered the period of 1994-95 to 2008-09, has seemed to take a substantial growth, and at the same time, there seems equally a sharp decline of tea import. The table has, accordingly presented a rapid growth of export earnings during the same period except in the year 2006-07 of which data is not available.

Year	Export (MT)	Export (Rs. '000')	Import (Rs. '000')
1994/95	72.2	13574	65208
1995/96	72.7	15516	52171
1996/97	81.4	22617	86971
1997/98	35.01	11745	60218
1998/99	83.8	30081	27831
1999/00	81.6	25722	73277
2000/01	69.5	23084	98000
2001/02	79.6	27787	8838
2002/03	193	53908	468
2003/04	884	104822	992
2004/05	4316	438771	419
2005/06	4623	415632	5005
2006/07	7000	-	19000
2007/08	8600	902122	13123
2008/09	8889	1160593	9624

Table 5.1.5: Tea Exports and Imports

Source: National Tea and Coffee Development Board, 2011

The above table has, accordingly presented a rapid growth of export earnings during the same period except in the year 2006-07 of which data is not available.

Regarding the tea exports and imports of Nepal, which is shown in the table 5.1.5 can also be presented in the figure 5.1.5. The figure shows an increase in the export of tea with respect to that of import.



Figure 5.1.4: Tea Exports and Imports

5.2.3.5 Socio-Economic Impact of Tea Industry

Tea is emerging as a potential export commodity with significant potential to contribute to national income growth, employment creation and environmental protection. The growth of the industry seems very important from a gender perspective since women play an important role in the tea industry, mainly in leaf plucking. However, leaf plucking is not a high level job and workers are often underpaid. Although figures vary, one estimates that around 105,000 people are employed in this sector (ITC, 2007). The income generated from the sector is estimated to benefit around 420,000 individuals. It is estimated that around 66,576 workers are involved as direct employees in these tea estates as pluckers, factory workers and in other functions. Many of the daily-wage workers are landless and live in the estates on a permanent basis (UNDP, 2007). The percentage of women employment in the industry is also estimated to be higher than in other industries. This sector thus seems a strong engine for farmer's income generation and poverty reduction, as orthodox Tea gives competitive returns compared to other crops.

Small farmers have been attracted to growing tea as the demand and prices for orthodox tea bring higher returns than traditional crops. It seems that they are willing to forego production of other crops in favor of tea. Significant growth in land use and production are both due to the increased participation of small farmers in producing tea. Himalayan Orthodox Tea Producers Association is currently implementing, in cooperation with various donor agencies, a code that will bring the sector up to international standards. This includes the introduction of environmentally friendly and social accountable practices. This will have a very positive influence on the prices that small farmers get for their produce and on labor conditions in plantations and factories.

S. N.	Сгор	Crop Yield	Price	Value
		(ton/ha)	(Rs./kg)	(Rs. '000/ha)
1	Maize	2.4	13	31.2
2	Ginger	11	16	176
3	Cardamom	23	322	74.1
4	Firewood	1.75	0.25	5.2
5	Broom Grass	1.5	15	22.5
6	Tea: Orthodox	3.24	36	116.6
7	Tea: Organic	2.73	22	60.1
8	Tea: Hill General	4.22	28.2	119
9	Cabbage	7	3.5	245

 Table 5.1.6: Gross Value Per Hectare from Competing Land Uses in the

 Hills

Source: Nepal Tea & Coffee Development Board, 2011

The gross value per hectare from competing land uses in the hills area of Nepal, which is shown in the table 5.1.6 can also be presented in the figure 5.1.6, where the gross value per hactare seems high in short term vegetable farming such as cabbage. But orthodox tea seems profitable in the long run due to lesser operating cost and relatively stable prices.



Figure 5.1.5: Gross Value Per Hectare from Competing Land Uses in the Hills

5.2.3.6 Implications of SPS Compliance to Nepalese Orthodox Tea: Challenges in Quality Competitiveness Standards

Like other agri-food sectors in the markets of developed countries, public and private standards for quality, food safety, traceability, and sustainability are increasingly important in the tea sector. The export of tea has become more complex as the result of factors such as increasing competition, globalization, government procurement (new vertical and horizontal arrangements and changing power relationships in the supply chain) and ethical, ecological and food safety concerns of consumers and buyers. The producers are seeing a clear increased demand for "Food Factory Concepts" and certification systems, such as Hazard Analysis and Critical Control Points (HACCP), ISO133 22000 and ISO 9001:2000. To achieve such certification, factory modernization and/or process automation are essential, which require capital infusion and which may add to production costs. Because the implementation of private and public standards can raise costs without necessarily raising income or increasing market share, they are often seen as nontariff barriers. Therefore, these quality measured present a challenge in varying degrees for the producers and exporters of tea. Implementation of such private and public standards that are mostly set by Western-governments, has risen a substantial costs Especially Sri Lanka but

also India and Kenya have been more successful than the other countries reviewed in capturing value added by among other things exporting tea in tea bags, tea in packets and instant tea (Wal, 2008).

Another vital issue for the increment of cost of production for Nepalese producer and exporters is traceability component, which is increasingly important for ensuring food safety and quality but also ensuring sustainability aspects (e.g. organic, fair trade). Various forms of traceability are possible and operational. For example, in fair-trade and organic systems, the chain of custody requirements ensures traceability. That means that all operators must be certified/registered to handle certified produce and information about the original producer is stored throughout the chain. Traceability is generally possible in the tea sector, to a certain extent. For instance, batches sold through auctions include information on who has produced the tea. If these are plantations that only process their own tea, then traceability does not pose a problem. Traceability is difficult and costly; however, if plantation factories also buy green leaf from other producers, such as smallholders, in order to process it in their factories. This applies equally to independent factories that source tea from smallholders who might have their teas mixed at tea collection centers or by collectors. As a result, increasing traceability requirements could lead to further restructuring in the tea supply chain.

Also the producers, smallholders and other stakeholders in the tea sector have been facing increasing costs of production due to higher costs for labor, fuel and electricity. Other factors raising production costs include small scale of production, age of tea bushes, high overhead costs, bad agricultural practices, low labor productivity, climate change and poor infrastructure leading higher transportation costs. As a result of factors such as increasing primary production costs, falling prices and globalization that has facilitated increased trade and enhanced competition between tea exporting countries, the tea sector is seeing restructuring take place.

While these developments can be seen as challenges and marketing opportunities for Nepalese tea in the international markets, they may have serious repercussions for less resourceful or organized supply chain actors, such as smallholders, whose importance in world tea production is clearly increasing. For instance, some analysts have pointed out that multinational tea companies are

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increasingly contracting with larger agro-processing firms, which are able to effectively coordinate deliveries and quality standards from small farmers through effective supply chain management. This trend may result in increased selectivity amongst suppliers and may lead to a reduced supplier base.

However, the costs of production on smallholder tea farms have remained relatively lower than on the estates primarily because there are many hidden family labor costs, and also because the smallholders do not have to bear any social costs. Consequentially the smallholder production model has become more attractive and important. But the growth of smallholder tea production worldwide could present sustainability challenges precisely because regulation in this subsector is less strict and farming processing practices may not meet the stringent quality compliance. In the longer term, as a result of the difficulty of including these producers in exportoriented supply chains with increasing quality, social and environmental demands. This is because smallholder models also present challenges in terms of lower traceability, quality and continuous supply.

5.1.3.7 Quality Compliance Issues for Nepalese Tea within SPS Framework

In recent years, agricultural exports including a variety of tea products to developed country markets have emerged as a potentially major source of export growth for many developing countries. Exploiting this potential, however, poses many challenges. The capacity of Nepalese tea producers and exporters to enter the developed countries' markets depends critically on their ability to meet the stringent food safety standards imposed by these markets. Not only are these standards stringent, but they are increasingly so. They now go well beyond traditional quality standards, as producers and exporters of orthodox tea must pay closer attention to the responsible use of agrochemicals, energy, water and wastes, as well as social and environmental impacts. These standards are significantly higher than those prevailing in conventional production and trading practices. They are subject to frequent changes and are, ultimately, often difficult and costly to meet (UNCTAD, 2005).

It has to be noted, however, that the globalization of markets and the acceleration of technological changes has led to a definite redirection by most developed countries in their food control organization; Nepalese orthodox tea has been gaining the international markets. For Nepalese orthodox tea producers and

exporters to meet the stringent SPS compliance (for ISO: 22000) have, therefore, the following compliances to be benefitted from the international markets which are derived from the focus group discussions and from different literatures.

- i. **Traceability System:** Under this compliance, the producers are required to establish a traceability system that allows product to be traced back to the registered farm or identification product lots and their relation to batches raw materials, processing and delivery records. This system also demands to identify every incoming material from the immediate suppers and the initial distribution route of the end product. Handling unsafe product and in the event of product withdrawal is also another provision.
- ii. **Documentation, Record Keeping and Self-Inspection:** This requires to keep up-to-date records for a minimum of three years that reference each area covered by a crop with all the agronomic activities. This is important to refer the records of all fertilizer applications, irrigation/fertigation, water use, crop protection product applications and complete self-inspection and document it annually. It also helps for the maintaining of records to provide evidence of conformity to the requirements and evidence of the standard operating procedure.
- iii. **Site Management:** It requires the preparation of soil maps for the farming and its regular maintenance.
- iv. Risk Assessments (revised annually): It requires food safety, operation of health and environment risk assessment, potential risks for organic fertilizer for disease transmission, risk assessment for irrigation water, hygiene risk analysis for harvest and pre-farm gate transport process, risk assessment of hygiene aspects of the produce handling operation, identification of all possible waste products produced, risk assessment for working conditions, residual analysis and quality control assessment.
- v. **Technical Services:** This involves the consultation on quantity and type of fertilizer since it needs a trained technician to determine quantity and type of fertilizer to use and also for choice of pesticides. Use systematic methods to calculate water requirement of the crop, hiring of technician with recognized certificates or formal training to advise/carry out post-harvest treatments and development of procedures for water management, hygienic product handling

(physical, chemical and microbiological contaminants) are other requirements. Technical service also requires for the waste and pollution action plan.

- vi. Laboratory (ISO 17025 or equivalent standard) Analysis: The laboratory needs for annual pesticide residue testing , checking maximum levels for heavy metals established by the Codex Alimentarius, microbiological contaminants criteria (CAC/GL 21–1997), contents of N·P·K of organic fertilizer. It also analyses irrigation water at least once a year to be done by a suitable laboratory and carry out annual analysis of water for post-harvest washing.
- vii. Soil and Substrate Management: This requires the use of cross line techniques on slopes, drains, sowing grass or green fertilizers, trees and bushes on borders of sites.
- viii. **Fertilizer Use:** This requires fertilizer application machineries, fertilizer storage which should be covered area, free from waste, dry, well ventilated and free from rainwater or heavy condensation at least 25 meters away from direct water sources. It also needs to carry out verification of calibration by a specialized company every year.
- ix. **Crop Protection:** This requires implementation of IPM techniques, modern application equipment, annual maintenance check of state of application machinery, pesticide storage and handling, crop protection products storage (sound and robust, secure, lockable, a source of clean water no more than 10 meters distant and eye washing facility appropriate to the temperature conditions, built of materials or located so as to protect against temperature extremes, fire-resistant, well lit and shelving made of non-absorbent material, utensils). It also needs a dedicated vehicle for pesticide transport including vehicle purchase, chemical mixing area, separate storage for empty containers, disposal of empty crop protection product containers in a safe manner, application machinery with pressure-rinsing equipment for containers and dispose of obsolete crop protection.
- x. **Irrigation/Fertigation:** This requires implement a water management plan to optimize water use and reduce waste.

- xi. Harvesting and Pruning: This requires an improved hygiene, removal of packed produce from field overnight, packaging/harvesting containers on farm, label in accordance with CODEX STAN 1–1985, Rev. 2–1999 plus, produce variety and/or commercial type, name and address of exporter, packer and/or dispatcher, identification code and country of origin.
- xii. **Produce Handling:** This requires implement an hygiene procedure (where water is recirculated for final produce washing, it is filtered and disinfected, and routinely monitored), pruning and maintenance of garden, on-farm facility for produce handling and/or storage, floors designed to allow and ensure drainage with slopes, drainage channels, light bulbs protected/shielded so as to prevent contamination of food in case of breakage and separate storage for waste material.
- xiii. Waste and Pollution Management, Recycling and Re-Use: This includes waste and pollution action plan. Farms needs to have designated areas to store waste and treat waste water.
- xiv. Worker Health, Safety and Welfare: This requires training to the workers for the operation of dangerous or complex equipment, handling pesticides and first aid. It also needs basic hygiene training for product handling by qualified people or consultant. Facilities, equipment on accident procedures or emergency preparedness are also included in this cluster. Toilets and handwashing equipment for harvest workers and production (receiving, rolling, fermentation, draying, sorting, testing and packaging), medical equipment (packing house and cold store), fire equipment (packing house), system for the signs of warning of potential dangers placed on access door panels with emergency preparedness' procedures are very impotent components in this category. Likewise, separate storage for all protective clothing (e.g. rubber boots, waterproof clothing, protective overalls, rubber gloves, face masks etc.), health checks of staff working with pesticides, living quarters on farm (habitable with sound roof, windows, doors, and toilets) are other factors fall under this requirement. Worker health, safety and welfare are also important factors in this cluster.
- xv. **Environmental Issues:** This requires carrying out a base line audit of the fauna and flora on farm, developing a wildlife conservation statement, and

conducting training farmers on environmental impacts of agricultural activities and implementing wildlife and conservation measures.

- xvi. **Certification:** Orthodox teas that are exportable to the international markets require quality certification as per the SPS standard which is very costly for the Nepalese producer.
- xvii. **ISO 2200 Procedures:** This requires to adapt ISO 22000 checklist as per the local/crop conditions and training course for producers.
- xviii. **Communication:** This requires the advanced communication with suppliers and contactors, customer handling, complaint and feedback operation and establish unit to co-ordinate regulatory and statutory authorities

However there are many compliance components mentioned above, which requires a huge costs for SPS conformity, Nepalese highland orthodox tea has potential in the world markets. Nepal enjoys free access in the major markets with the exception of Russia that imposes a very high conditional tariff of 20 percent but not less than 0.8 Euros per k.g. In almost all tea exporting countries normally the export duty is not levied in the export of tea. After the introduction of GSP facility to the low income countries by the EU Countries, USA, Japan, the import duty is waived in the import of tea. This type of relaxation by EU is being provided under the Lome Convention since 1995 to Africa, Caribbean and Pacific Countries under the tea import from Renewed Generalized System of Preferences (FNCCI, 2008).

Given the background, this study aims to identify and quantify the SPS compliance costs for Nepalese tea for the international markets that is faced by the producers and exporters. It has presented a framework that has facilitated estimation of costs of compliance for producers and exporters that are associated with tea as agricultural safety standards and SPS. These costs of compliance conceptualized and estimated in chapter vii.

5.1.3.8 SWOT Analysis of Nepalese Tea Industry in WTO Regime

Nepalese tea industry is found to have a potential growth industry with comparative advantage of soil, weather conditions, and the availability, an important channel for reducing poverty due to its strong linkages to rural communities. As large areas of Nepal are suitable for tea plantations, and global demand for orthodox tea, this subsector of the economy continues to grow. As the Nepalese tea industry is relatively young, the quality of tea trees is regarded as high, compared to those in India leading many to consider tea to be a potentially important export. However, significant obstacles to investment and expansion remain. The average yield of Nepalese tea is considerably lower than in comparable areas as it figures 25 per cent lower than in India and 30 per cent lower than in Sri Lanka (Gail et al., 2010). Although other countries already have reaped the competitive advantage by producing and supplying organic orthodox tea, Nepal is yet to initiate and streamline system-wide organic tea production. Nepal's orthodox tea farmers also have difficulty in fetching a fair price for their tea leaves, often not even meeting their costs of production. Sometimes the price is as much as 15 per cent below the cost of production. Additionally, many farmers are not familiar with an appropriate knowledge to calculate a fair price that covers the cost of production plus earn a profit. Often they do not include all the direct and indirect costs incurred throughout the year (Waurakalle et al., 2007). Similarly, limited transport infrastructure and underdeveloped marketing channels further constrain tea's potential. The following are regarded as the strength, weakness, challenges and threats of Nepalese tea sector promotion.

A. Strengths

- i. Good climate and geographical conditions
- ii. Large area under tea cultivation; land available for expansion
- iii. Environmentally friendly crop
- iv. Short crop cash cycle
- v. Young tea bushes (relative to nearby India's bushes)
- vi. Low labor costs
- vii. Farmers' cooperatives willing to work together
- viii. Cultivation methods and required standards clearly spelled out
- ix. Opportunities for rural people's and women's employment and empowerment
- x. Contribution to poverty alleviation
- xi. Steady growth in export volume and earnings
- xii. Institutions in place to guide tea industry
- xiii. Communication system adequately developed in village areas

- xiv. Industry driven by the private sector
- xv. Availability of international expertise
- xvi. Government grants and subsidies on land leases, plant materials, tools, machinery available
- xvii. Loans at attractive interest rates available
- xviii. Code of Conduct good first step to achieving good agricultural and manufacturing practices, and fair trade practices and standards

B. Weakness

- i. Shortage of processing capacity
- ii. Poor quality, incorrect and overuse of chemicals, insecticides, pesticides
- iii. Poor on-farm infrastructure
- iv. Irregular supply of electricity
- v. Financing difficulty; VAT refunds delayed
- vi. Dependency on India's ports for export transportation
- vii. Ineffective implementation of good government policies
- viii. Poor product reputation due to high minimum residue levels and inconsistent quality
- ix. Lack of well equipped, accredited laboratories
- x. No research facilities
- xi. No central marketing facility or services
- xii. Actors poorly trained in business skills
- xiii. Packing materials expensive
- xiv. Market information inadequate and not timely
- xv. Lack of human resources, especially in quality control and export marketing (contributes to credibility loss)
- xvi. Facilities to prepare large export orders not available
- xvii. Insufficient quantity of standardized quality tea for large export orders

xviii. Relatively low yield compared with yields elsewhere

C. Opportunities

- i. Develop good brand image, including geographical indicators (especially in response to declining image of Darjeeling tea)
- ii. Establish more factories to accommodate existing green leaf growth

- Establish large blending, warehousing and packaging facilities to handle larger consignments
- iv. Expand and create new plantations where sufficient and appropriate land is available
- v. Develop new export markets
- vi. Encourage and facilitate banks to provide easier access to agriculture and export financing, processing facility construction, and export insurance coverage
- vii. Develop a research and training centre to produce new clones and seed stock suitable for Nepal's environmental and climatic conditions
- viii. Strengthen NTCDB to enhance private sector tea industry development
- ix. Improve food laboratory facilities and obtain accreditation
- x. Improve/expand bilateral and regional trade/transport agreements to improve exports with and cargo facilities in India & Bangladesh
- xi. Take advantage of unique environment and weather patterns to develop high quality, specialty tea products
- xii. Encourage the growing private sector to serve as specialty advisory agents and input suppliers
- xiii. Take advantage of supports for obtaining internationally accepted certifications for existing and new factories

D. Threats

- Loss of potential markets due to poor product quality; declining prices for poor quality teas globally, indicating need to increase quality and consistency standards
- ii. Political instability
- iii. Interference from outside sources in internal management of companies and factories
- iv. Heavy reliance on Indian processing and marketing, resulting in loss of Nepal brand identity
- v. Migration of young labor force to urban areas for better employment opportunities

- vi. Inadequate policing of border trade, with negative impacts on agricultural inputs, product quality and exportable quantities of tea products
- vii. Ad hoc changes in Indian policy that disrupt operations and cause sudden hardships for entire industry
- viii. Competition from other producer countries that are developing rapidly to meet global demand and standards
- ix. Limited financing for farmers, collectors and local processors
- x. Global warming and other natural disasters having adverse effects on agricultural lands
- xi. Middlemen interfering with supply chain, primarily at the rural farmer level
- xii. Increasing global production and availability of tea, resulting in global oversupply of product and reduced prices
- xiii. Loss of credibility, with resultant loss of former and potential new buyers, due to poor performance of exporters and discrepancies between "offer" samples and delivered product

5.2.4 Revenue Performance of Nepalese Trade Liberalization

Nepal's revenue has long been supported substantially by the custom revenues like many other developing and the LDCs. This naturally indicates that the import has been dominating the international trade resulting the balance of trade always deficit. Furthermore, the trade deficit with India is perennially huge. Surprisingly, in the pre-liberalization period when Nepalese economy was characterized by inward-looking and state-led development strategies with policy measures of the protection to domestic industries, import substitution, state-led industrialization, and government monopolies in major industries, trade performance was not favorable for Nepal due to import heavyweight compared to its export. Even after the accession of Nepal to the WTO, the share of export in total trade decreased from 28.2percent in 2004/05 to 14.5 percent in 2010/11 in comparison to the increase in import from 71.8 percent to 85.9percent during the same period (GoN, 2012).

Nepal like many other developing countries continues to rely heavily on trade taxes as a source of revenue. A primary concern for many countries amidst continuous trade liberalization is the potential impact of trade liberalization on public revenues. Generally, in the initial stage of liberalization, the revenue consequences of reform may be relatively small. The tariffication of quotas and moving towards a more uniform tariff may lead to an increase in trade tax revenues (Ebrill et al., 1999, Keen and Ligthart, 2002). But subsequent move toward intensive trade liberalization may have the potentials of losses in trade related tax revenues with a danger of escalating a phenomenon of widening both budgetary and trade deficits. Negative fiscal impact may originate from the possibility that domestic revenue might not rise sufficiently to offset the fall in international revenue earnings due to tariff reductions. In addition, reduction in export taxes may lead to a decline in export revenues either through lower export tax revenues or through lower income earned from exports and consequently lower income from tax receipts. Devaluation of the exchange rate causes currency value of imports to rise, and if import responds to price changes, import may decline and revenue from import may also decline.

Nepal after beginning economic reforms in the mid 1980s intensified liberalization from the early 1990s with the implementation of Enhanced Structural Adjustment Facility (ESAF) program of the IMF in 1992 qualifying it as one of the highly liberalized countries in South Asian region (HMG, 2004). Nepal's prevalent tariff rates in both agriculture and non-agriculture manufacturing sector are low with average rate being in the neighborhood of 14 percent. A more recent study indicates that the rate is below 10 percent (Khanal, 2004). Today Nepal in a way to fulfill WTO obligations is engaged in further liberalization of trade by reducing some high tariff rates. It has also started rationalizing tariff structure in addition to moving toward eliminating local development tax, special security and agriculture related levies in a phase-wise manner. Therefore, a thorough assessment of revenue implications of trade related policies would be critically important from policy point of view in the Nepalese context.

Nepal's import revenue performance after tariff liberalization stands, perhaps, in between the advocacies of two different schools of thoughts – comprehensive liberalism and progressive liberalism. This is because, the trade liberalization on custom revenue, unlike in some developing and least developed countries, has not been found almost stable in both pre and the post-liberalization periods with the growth rate 6.81 and 6.26 respectively. However, regarding the measure of trade tax
as the percentage of import volume, which is an index of trade openness, in these corresponding periods (12.96 in pre and 8.07 in the post-liberalization period) is found to have a negative impact. Overall, Nepal's liberalized trade regime has not been proved as instrumental both for the economic growth and macroeconomic stabilization as performances in terms of the growth in GDP, favorable balance of payment situation as it has long been characterized by increasing trade deficit, increase in the foreign direct investment, generation in employment, and income have not been found to be promising.

Amidst a growing concern that in the course of intensive trade liberalization there might be unexpected revenue losses in developing countries if liberalization or reform is confined on reducing tariff rates in which trade taxes constitute the major source of revenue, Nepal has been able to upset the possible revenue loss partly by the nature of elastic import demand or by accompanying by a more than compensating import volume increase with respect to trade tariff cuts. Like many countries of which trade was highly protected in the pre-liberalization period, impact on custom revenue due to reduced tariff regime has been compensated by the tariffication system. On the other hand, Nepalese tax revenues have been supported by value added tax levied after the custom duties and reformations initiated on the domestic taxes system, for example value added tax and other administrative processed also helped upset the custom gap produced by the trade liberalization. , Likewise, tariff rationalization and reduction of tariff dispersion might actually raise the tariff rate on previously untaxed imports, such as food or industrial inputs (Rajaraman, 2006). The other factors behind positive tariff revenue to GDP ratio may come from the fact that the revenues need not necessarily fall with trade tariff cuts, especially if the starting point is highly tariff-protected, yielding high percentage increases in import volume starting from a low base, in response to small percentage reductions in the tariff. And when trade reform involves tariffication of non-tariff barriers in trade liberalization, there could be a huge increase in revenue.

5.2.5 Measures of Trade Liberalization and their Impact on Revenue

Assessment of the revenue effects of trade liberalization requires generally various indicators. Among them, removing trade restrictions, doing away with import licensing, reducing tariff rates, removing quantitative restrictions, and dismantling the erstwhile system of foreign exchange rationing have come to be recognized as

standard measures of trade liberalization. A number of trade liberalization measures have been used for the purpose of empirical research. These include trade dependency ratio, growth rate of exports, tariff rate averages, tariff-GDP ratios, coverage of quantitative restrictions, black market premium, trade bias index, anti-export biasness, Sachs and Warner index, Leamer's openness index etc (Razzaque et al. 2003). However, due to methodological problem, theoretical constraint and lack of availability of data for year-to-year comparison, many of the aforesaid indicators cannot be used for country-specific analysis. Indicators such as the dependency ratio, export growth rate, tariff average and collected tariff ratio have been used in the case of country specific studies. However, limitations with respect to availability of appropriate time series data had to be kept in mind in selecting the appropriate variables for the present study as well.

Considering the nature and availability of the data, this section has tried to explain the implication of Nepalese trade liberalization policy to the revenue performances comparing the changes of various indicators between the pre and the post-liberalization periods. For this, some popular indicators to measure the direction and impact of trade liberalization has been presented. These measures includes the comparative averages of percentages between pre and the post-liberalization periods like trade revenue index, trade revenue as percentage of GDP, trade as percentage of GDP, trade tax revenue as percentage of imports and trade tax as percentage of total trade.

Fiscal Year	Import Volume	Custom	TRI
1974/75-1977/78	2068.48	383.00	18.50
1978/79-1981/82	3930.83	718.93	18.59
1982/83-1985/86	7477.90	970.57	12.91
1986/87-1989/90	14840.85	2173.80	14.63
1990-91	23226.50	3044.28	9.94
Average (Pr	e-Liberalization Pe	riod)	13.11
1991/92-1994/95	46598.98	4894.26	10.45
1995/96-1998/99	86133.80	8414.10	9.79
1999/00-2002/03	113983.28	12565.14	11.01
2003/04-2006/07	163556.40	15826.99	9.83
2007/08-2010/11	319229.50	29679.45	9.30
Average (Pos	st-Liberalization Po	10.08	

Table 5.2.1: Trade Revenue Index: 1974-75 to 2010-11

Rs. in millions and %

Source: Economic Survey (Various Years)

The table 5.2.1 depicts the tariff revenue index (TRI) (i.e., custom revenues as percentage total import) in Nepal during 1974-75 to 2010-11. The estimated tariff rate index is found to be average 13.11 percent during the period of 1974-75 to 1990-91 and this index is found to be decreased to average 10.08 during the period of 1991-92 to 2010-11, which is the period of extensive liberalization. The figure thus clearly indicates the heightened pace of trade liberalization in Nepal during the post 1990 period. The table can be represented from the following figure 5.2.1.



Figure 5.2.1:Trade Revenue Index: 1974-75 to 2010-11

Regarding the trade tax revenue as percentage of GDP, there seems an expected results following many studies of developing countries regarding the trade revenue as percentage of GDP as it is relatively stable in both pre and the post-liberalization periods.

 Table 5.2.2: Trade Revenue as Percentage of GDP: 1974-75 to 2010-11

Rs.	in	mil	lions	and	%

Fiscal Year	Trade Revenue	GDP	Trade Revenue as % of GDP
1974/75-1977/78	383	17750.58	2.15
1978/79-1981/82	718.93	26943.5	2.66
1982/83-1985/86	970.57	43858.08	2.21
1986/87-1989/90	2173.8	83364.02	2.6
1990-91	3044.28	120370.27	2.53
Average (Pre-	Liberalization Perio	d)	2.43
1991/92-1994/95	4894.26	184852.01	2.6
1995/96-1998/99	8414.1	293076.75	2.88
1999/00-2002/03	12565.14	443170.27	2.83
2003/04-2006/07	15826.99	627017.86	2.55
2007/08-2010/11	29679.45	1086261.5	2.73
Average (Post-	2.72		

Source: Economic Survey (Various Years)

Table 5.2.2 shows relatively stable share of trade tax revenue to GDP is found to be average 2.43 percent during the period of 1974-75 to 1990-91 and this figure is found to be marginally increased to average 2.72 during the period of 1991-92 to 2010-11, which is the period of extensive liberalization. The above table is represented by the following figure 5.2.2.



Figure 5.2.2: Trade Revenue as Percentage of GDP: 1974-75 to 2010-11

While examining the trade revenues as percentage of GDP, the figure shows a marginal variation in both period of time i.e. before and after the trade liberalization period. But this trend in the pre-liberalization period is more volatile than that of the post-liberalization period.

 Table 5.2.3: Total Trade as Percentage of GDP : 1974-75 to 2010-11

Rs. in millions and %

Fiscal Year	Total Trade	GDP	Total Trade as % of GDP
1974/75-1977/78	3140.05	17750.58	17.67
1978/79-1981/82	5317.7	26943.5	19.67
1982/83-1985/86	9641.55	43858.08	21.93
1986/87-1989/90	18955.2	83364.02	22.69
1990-91	30614	120370.27	25.43
Average (Pre-	Liberalization Perio	d)	21.48
1991/92-1994/95	63575.38	184852.01	34.03
1995/96-1998/99	112560.65	293076.75	38.52
1999/00-2002/03	164571.33	443170.27	37.38
2003/04-2006/07	221614.8	627017.86	35.36
2007/08-2010/11	382261.13	1086261.5	35.22
Average (Post	36.10		

Source: Economic Survey (Various Years)

As the table 5.2.3 bears out, the total trade as percentage of GDP is found to be 21.48 during 1974-75 to the 1990-91 and the percentage is found to have increased rapidly afterwards and reached about 36.10 percent during the postliberalization period of 2010-11. Although this increase corresponds with the pace and extent of trade liberalization in Nepal during the corresponding period, it is, however, difficult to draw any causal relationship between the two. Indeed, suitability of this trend as a measure of trade liberalization has been questioned in the literature (Bhattacharya et al, 2006). The above table 5.2.3 is represented by the following figure 5.2.3.



Figure 5.2.3: Total Trade as Percentage of GDP : 1974-75 to 2010-11

Dealing with the trade as percentage of GDP, the figure shows that there is a gradual increase of trend in the early years of trade liberalization and the trend seems to be somewhat stable after mid nineties.

Custom duties as percentage of import volume have been widely used in most of the literature as a good indicator of trade liberalization. The dynamics of this trend shows the extent to which import tax has been substantially decreased in the postliberalization period as compared to the pre-liberalization period.

 Table 5.2.4: Trade Tax Revenues as Percentage of Import: 1974-75 to 2010-11

Fiscal Year	Import Tax	Imports	Import Tax as % of Imports
1974/75-1977/78	383	2068.48	18.5
1978/79-1981/82	718.93	3930.83	18.59
1982/83-1985/86	970.57	7477.9	12.91
1986/87-1989/90	2173.8	14840.85	14.63
1990-91	3044.28	23226.5	13.11
Average (Pre-	Liberalization Perio	d)	15.55
1991/92-1994/95	4894.26	46598.98	10.45
1995/96-1998/99	8414.1	86133.8	9.79
1999/00-2002/03	12565.14	113983.28	11.01
2003/04-2006/07	15826.99	163556.4	9.83
2007/08-2010/11	29679.45	319229.5	9.33
Average (Post-	10.08		

Rs. in millions and %

Source: Economic Survey (Various Years)

The both table and figure shows the import tax as percentage of import volume. The import tax to import volume during the period of 1974-75 to 1990-91 decreased from 15.55 to 10.08 during 1991-92 to 2010-11. While assessing the impact of trade liberalization on the government's revenue primarily is reflected on the trade tax to import ratio. The Table 5.2.4 is represented by the following figure 5.2.4.



Figure 5.2.4: Custom Duties as Percentage of Import: 1974-75 to 2010–11

Taking the custom duties as percentage of import, the figure shows a gradual decrease in both period of time i.e. before and after the trade liberalization period. But this trend in the pre-liberalization period is more volatile than that of the post-liberalization period, while it is somewhat stable in the post-liberalization period.

It is generally accepted that total trade taxes as the percentage of trade, sometimes referred to as the effective tax rate in international trade, is a better measure of trade liberalization. This indicator has been extensively used in most of the empirical studies (Khattry and Rao, 2002, Khattry, 2003, and ATPC, 2004). On the one hand, this trend captures the total volume of trade and on the other; it traces the pace of change in total trade taxes during the pre and post trade liberalization periods.

Fiscal Year	Trade Tax	Total Trade	Trade Tax as % of Total Trade
1974/75-1977/78	383.00	3140.05	12.17
1978/79-1981/82	718.93	5317.70	13.62
1982/83-1985/86	970.57	9641.55	10.08
1986/87-1989/90	2173.80	18955.20	11.44
1990-91	3044.28	30614.00	9.94
l	Average		11.45
1991/92-1994/95	4894.26	63575.38	7.60
1995/96-1998/99	8414.10	112560.65	7.49
1999/00-2002/03	12565.14	164571.33	7.63
2003/04-2006/07	15826.99	221614.80	7.22
2007/08-2010/11	29679.45	382261.13	7.73
l	Average	7.53	

 Table 5.2.5: Trade Tax as percentage of Total Trade: 1974-75 to 2010-11

Rs. in millions and %

Source: Economic Survey (Various Years)

The table 5.2.5 and provides trend for the trade taxes as percentage of trade in Nepal since 1974-75. It is clear from the figure that the trend has decreased significantly after trade liberalization period. Total trade tax as percentage of trade during the period of 1974-75 to 1990-91 is found to be higher (11.45%) than in liberalization period (1991-92 to 2010-11). In the post-liberalization period, total trade tax as percentage of trade tax as percentage of trade tax as percentage of trade tax as percentage.



Figure 5.2.5: Trade Tax as percentage of Total Trade: 1974-75 to 2010-11

While examining the trade tax as percentage of total trade, the figure shows a gradual decrease in both period of time i.e. before and after the trade liberalization

period. But this trend in the pre-liberalization period is more volatile than that of the post-liberalization period, while it is somewhat stable in the post-liberalization period.

Thus, since 1991-92, all measures suggest that Nepal has experienced accelerated trade liberalization supporting the following analytical evident during this period.

5.2.6 Structure of Taxation and Openness in Nepal

While dealing with the structural change and trends of and openness of Nepalese economy with special reference to the economic liberalization, there seems a marked differences in two categories of periods; the pre and the post-liberalization. As empirical evidence suggests, average growth in exports has marginally decline having 13.50 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 16.81 percent during 1974-75 to 1990-91 period.

Likewise, average growth in imports has also declined having 16.41 percent during the post-liberalization period of 1991-92 while it was 17.56 percent during 1974-75 to 1990-91 period. The average growth in total trade is also found to be marginally decreased having 15.63 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 16.69 percent during 1974-75 to 1990-91 period.

	Percentage Growth in Trade			TD	TT	NTT	44	44
Fiscal Year	Irade		IK	11	NII	\mathfrak{u}_1	\mathfrak{ll}_2	
i iscai i cai	Export	Imports	Total					
1975-1991	16.81	17.56	16.69	6.61	2.43	4.20	15.55	21.48
1992-2011	13.50	16.41	15.63	9.03	2.72	6.31	10.08	36.10

Table 5.2.6: Structural Change and Trends of Openness of Nepalese Trade

Source: Authors' Calculation from Appendix XIV

But the average of total revenue as percentage of GDP (TR) is found to be increased having 9.03 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 6.61 percent during 1974-75 to 1990-91period. Likewise, the average of trade tax as percentage of GDP (TT) is found to be marginally increased having 2.72 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 2.43 percent during 1974-75 to 1990-91period.



Figure 5.2.6: Structural Change and Trends of Openness of Nepalese Trade

The average of non-tax revenue as percentage of GDP (NTT) is found to be increased having 6.31 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 4.20 percent during 1974-75 to 1990-91period. However, the average of trade tax revenue as percentage of import (tt₁), which is one of the indicators of the openness, is found to be substantially decreased having 10.08 percent during 1974-75 to 1990-91 period of 1991-92 to 2010-11 while it was 15.55 percent during 1974-75 to 1990-91 period. The average of trade as percentage of import (tt₂), which is another indicator of the openness, is found to be substantially increased having 36.10 percent during the post-liberalization period of 1991-92 to 2010-11 while it was 21.48 percent during 1974-75 to 1990-91 period.

5.2.7 Trends of Openness in Nepalese Economy

The manner in which the international economic policies of governments affect the rates of growth of their economies has long been a subject of controversy. Despite a number of multi-country case studies utilizing comparable analytical frameworks, numerous econometric studies, and important theoretical advances concerning how a country's international economic policies and its rate of economic growth interact, there is still disagreement among economists concerning the nature of the relationship (Baldwin, 2003).

However, the present study shows mix results regarding the economic openness and growth in revenues and thus the economic growth. From the evidence of the above table 5.2.6, inferences can be drawn that the total revenue, trade tax revenue, total trade and non-trade tax revenue as percentage of GDP are found to be increased in the post-liberalization period while comparing the pre-liberalization period. But, at the same time, trade tax revenue as percentage of import and the average growth rate of total trade are found to be declined. The main conclusions from the above analysis can thus be drawn as followings:

- i. Both indexes of trade openness (tt₁ and tt₂) indicate that Nepal has become more open over the last two decades. However, import taxes as percent of total import declined by 37.73 percent in the post-liberalization period with compared to the pre-liberalization period.
- ii. Nepal has become more globally integrated thanks to liberalization, as, the average growth of trade to GDP is found to have increased by 70.76 in the post-liberalization period with compared to the pre-liberalization period.
- iii. Due to the trade liberalization policy, trade tax revenue as percentage of GDP has also found increased by 12.86 percent in the post-liberalization period with compared to the pre-liberalization period.
- iv. Non-tax revenues have increased at a faster pace compared to tax revenue. The non-tax revenue as percent of GDP is found to be increased by 50.23 percent in the post-liberalization period with compared to the preliberalization period.

CHAPTER VI

IMPACT OF SPS COMPLIANCE IN THE WTO REGIME

Developing and the least developed countries within the trade liberalization regime and multilateral trading framework of WTO have been implicated within an optionless alternative while dealing with their economic and business environment for growth and development : achieve economic growth facing tough challenges. This policy option has thus provided both the opportunities and challenges. Within this policy framework, the country can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages only when the products are able to meet the stringent quality standard – for example, the SPS measures – in developed countries' markets. As this quality compliance of exportable commodities involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength.

6.1 Costs of Compliance to Exports

However, the contemporary history of international trade witnesses a marked progress in lowering barriers to trade, for example, the tariffs over the past half century, the practice of non-tariff barriers (NTBs) has widely been practiced. And the recent efforts to regulate these measures have resulted in the WTO Agreements in TBTs and SPS regulations. With the world-wide reduction in tariffs under the auspices of the GATT/WTO standards and, more generally, non-tariff measures (NTMs) have further gained importance in world trade. This trend also reflects the growing concerns over product quality and consumer health and safety. There are also non-trivial compliance costs associated with standards. Consequently, such measures have the potential to restrict trade by effectively protecting local producers from foreign competition. A greater understanding of the trade and welfare effects of standards is of utmost importance.

As consumers in industrialized countries are increasingly concerned about food safety, governments use a variety of measures to ensure that the products are protected from contaminants, toxins and other organisms that may affect human health. These measures seem to be stringent; for example; SPS measures, to protect human health and the health of animals and crops from pests and other diseases that may be transmitted by cross-border trade of food, plants, or animals. In parallel, consumers, retailers, and processors are developing their own quality standards. These compliances of quality standards impose significant costs to the producers and exporters of the developing and least developed countries.

Although, in many cases, the functions of standards are justifiable and of great value, they may create distortions at both the national and international levels. The impact of tariffs can usually be estimated from the tariff rate itself. In contrast, the effects of technical standards are more difficult to measure. They are generally embedded in the firm-specific costs associated with the changes required to meet the standards and conformity assessment procedures in different potential export markets. As a consequence, broad systematic studies of the impact of technical standards on trade are lacking. Much of the available information consists of broad reviews and/or anecdotal evidence based on limited case studies.

The evolution of SPS measures is traceable to GATT rules, especially Article XX (b) which allows countries to introduce measures to protect human, animal or plant life or health. A further development of this provision is the full-fledged Uruguay Round Agreement on the Application of Sanitary and Phytosanitary Measures which contains the definition of SPS measures. The SPS Agreement can be viewed as an attempt to discipline the "seemingly never-ending demand for further regulation of the food system to protect public health" (Henson & Heasman, 1998).

While the Agreement confirms the legitimate right of countries to use SPS measures for the purpose of providing the level of health protection they consider appropriate, it also aims at ensuring that this right is not abused for protectionist purposes and that its exercise does not have unnecessary negative effects on international trade. Hence, the SPS agreement includes several provisions directed at preventing the abuse of the right to use SPS measures (UNCTAD, 1999a). First, the Agreement encourages countries to base their SPS measures on established international standards, guidelines and recommendations. But it also provides loopholes: countries may introduce SPS measures that result in a higher level of protection than would be yielded by those based on if there is scientific justification or if the country determines, on the basis of appropriate risk assessments, that a higher level of protection would be necessary. Second, the SPS agreement seeks to promote

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the international harmonization of SPS measures by encouraging importing countries to accept the SPS measures of exporting countries as equivalent, if they achieve the same level of protection. Harmonization is facilitated further, in this respect when countries enter into mutual recognition agreements. Third, in deciding among alternative SPS measures which provide the same level of food safety or animal and plant health, countries are encouraged to apply those which least restrict trade, provided they are technically feasible. Finally, the agreement restricts the legitimate use of SPS measures to only those necessary for the protection of food safety and animal and plant life and forbids unjustified discrimination whether in favor of domestic producers or among foreign suppliers.

6.1.1 Food Quality Standards: An Overview

6.1.1.1 Inventory of Standards

There are an increasing number of standards, including standards set by international organizations, national governments or regional organizations, producers, retailers, and NGOs. In addition, consumers' concerns have given rise to a number of certification or labeling initiatives. These standards apply to different levels in the food chain, and some reach down the chain to producers.

The international framework of SPS standards regarding food safety has been developed as the following quality compliance standards under the World Trade Organization Agreement, the World Health Organization (WHO), and the Food and Agriculture Organization (FAO).

i) International Plant Protection Convention (IPPC)

The IPPC is a multilateral treaty deposited with the Director General of the FAO. The SPS agreement identifies the IPPC as the organization responsible for elaborating the standards that will help ensure that the measures implemented by each country to protect plant health are harmonized and that they do not constitute barriers to trade. It is, therefore, an important treaty in international trade.

ii) Codex Alimentarius

The Codex Alimentarius is the recognized international body for food standards. Codex standards, guidelines and codes of practice are recognized by the WTO as references for the settlement of disputes in international trade. For that reason, food safety standards of most countries are based on the Codex.

iii) EU legislation

The EU legislation is of particularly importance for African countries as the EU is the main destination of agricultural exports. The fruit industry is especially dependent on the EU market with 80 per cent of total exports going to the EU (TSG, 2004). Given that most exports from low income countries enter the EU market duty-free, changes in EU quality policies are the most likely to influence export capacity.

iv) EurepGap

In the area of fruits and vegetables, retailers are advocating compliance with standards such as EurepGap, British Retail Consortium (BRC), Nature's Choice and others. Given the increasing role of large supermarkets in importing food into Europe, the protocols they impose are now of paramount importance. Of these, one of the most widely accepted is the EurepGap.

v) Hazard Analysis and Critical Control Points (HACCP)

HACCP is a systematic approach to the identification, evaluation, and control of food safety hazards. The approach was first started in 1959 with the Pillsbury Company's manufacture of food products for the NASA space program. Since then, HACCP has been strongly suggested as an effective approach to prevent food safety hazards by many national and international scientific groups, corporations, government agencies and academic organizations (Peirson, 1995).

The joint FAO/WHO Codex Alimentarius Commission endorsed HACCP in 1993. The concept of HACCP is to focus on preventing hazards

that could cause food borne illnesses by applying science-based controls from raw materials to finished products. It involves seven principles:

- i. Hazard analysis, which involves collecting and evaluating information on hazards associated with the food under consideration to decide the significant hazards to be addressed in the HACCP plan.
- ii. Determination of critical control points (CCPs), which are points where controls can be applied and are essential to prevent, eliminate or reduce a hazard to an acceptable level.
- iii. Establishing critical limits, which are maximum/minimum values to which a biological, chemical, or physical parameter must be controlled at CCP.
- iv. Establishing monitoring procedures to assess whether a CCP is under control and create an accurate record for future use in verification.
- v. Establishing corrective actions, in case there is a deviation from an established critical limit.
- vi. Establishing verification procedures to verify that the HACCP system is working correctly.
- vii. Establishing record-keeping and documentation procedures to document the HACCP system.

Each food processing establishment is required to have its own HACCP plan tailored to its individual products. Moreover, there are required prerequisite programs prior to the implementation of HACCP. Prerequisite programs such as Good Manufacturing Practices (GMP) are an essential foundation for the success of a HACCP plan (NACMCF, 1997).

HACCP has been and is being mandated into law in many nations all over the world. In the EU, HACCP principles were adopted through the Directive 93/43 in 1993 (Ziggers, 2000). In the US, HACCP was mandated for seafood in 1995, for meat and poultry in 1998, and for the juice industry in 2001 (FDA, 2001). The Australian Food Standard Code required HACCP-based food safety programs from January 2003 onwards (Food Standards Australia New Zealand, 2002).

HACCP is the preferred approach to food safety hazards, especially microbiological hazards. However, HACCP is also criticized for its focus on reducing hazards over individual segments of the food chain rather than targeting the risk to consumers. Therefore, its benefits might not be recognized as improvements made at one level and may not be communicated or capitalized in upstream and downstream markets (Caswell et al, 1998).

vi) ISO 22000

ISO 22000, the food safety management systems was first published in 2005. The standard provides international harmonization in the field of food safety standards, offering a tool to implement HACCP throughout the food supply chain. Prior to ISO 22000, a great number of standards had been developed in different countries, and organizations in the food sector used their own codes to audit their suppliers. The sheer number of standards (and the costs of conforming to all of them) combined with the increased globalization of the food industry made it nearly impossible to keep up with the different requirements in the global food market. Additionally, food borne illnesses increased significantly in all markets, resulting in both economic losses and damaged reputations.

The development of the ISO 22000 standard began in 2001, with a recommendation from the Danish Standardization Body to the secretary of ISO's technical committee ISO/TC 34 (Food Products). The ISO then developed the standard in conjunction with the Codex Alimentarius Commission and experts from the food industry. In August 2005, the final draft was unanimously approved by all 23 national standard bodies participating in the working group. ISO 22000 was subsequently published on September 1, 2005.

There is great interest in ISO 22000 globally. It has already been adopted as the national standard in many countries that participate in the European Committee for Standardization (CEN). In many other countries, regulatory authorities recommend the implementation and use of the standard. Early adopters of ISO 22000 have found that the standard is a great improvement over other specifications, helping them to better fulfill legal and food safety requirements, build process-based food safety management systems, and focus on continuous improvement.

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The goal of ISO 22000 is to control, and reduce to an acceptable level, any safety hazards identified for the end products delivered to the next step of the food chain (An end product is defined as a product that will not undergo any further processing or transformation by the organization). The standard combines the requirements for good manufacturing practices or prerequisite programs, requirements for HACCP according to the principles of the Codex Alimentarius, requirements for a management system, and interactive communication between suppliers, customers, and regulatory authorities to ensure food safety at all points of the food chain. While similar in philosophy to ISO 9001 and ISO 14001, ISO 22000 contains clauses that are specific to the food industry, including:

- i. The establishment of prerequisite programs (PRPs), which define the basic conditions and activities needed to maintain a hygienic environment, both within the organization and throughout the food chain.
- ii. The identification and control of food safety hazards, and the determination of an acceptable level of risk.
- iii. The establishment of a HACCP plan, including the identification and monitoring of critical control points: process steps at which controls can be applied to prevent or eliminate a food safety hazard, or reduce it to an acceptable level.
- iv. The handling of potentially unsafe food products to ensure that they do not enter the food chain.
- v. The establishment of a food safety team responsible for tasks such as hazard analysis, selection of control measures, establishment of PRPs, and planning of internal audits.
- vi. The information and characteristics needed for both raw materials and end products to ensure that a proper hazard analysis can be conducted.
- vii. The establishment of a communications plan with external parties such as suppliers, customers, and regulatory authorities to ensure that food safety information is available to all.

6.1.1.2 The SPS Measures

The SPS³ agreement sets out the rights and obligations of members of the WTO in relation to the health of plants and plant products and animals and animal products that regulates the specific quality compliance of products in international trade (Appendix V). The basic aim of the SPS agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate while ensuring at the same time that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to trade. The Agreement includes several provisions such as notification and making known factors considered in establishment of new standards to prevent abuse of rights of using SPS measures. It also provides a loophole that allows countries to introduce measures that result in a higher level of protection than would be yielded by those based on international standards for as long there is scientific justification for departure (Oyejide et al. 2001).

Sanitary and phytosanitary measures in the SPS Agreement thus are referred as mandatory technical requirements adopted by nations to protect the health and lives of humans, animals, and plants from risks associated with disease, pests, and contamination of foodstuffs, and to prevent damage caused by the establishment or spread of pests. Sanitary measures relate to human or animal health, whereas phytosanitary measures relate to plant health. The SPS measures include requirements for protecting fish and wild fauna, forests, and wild flora and consist of laws, decrees, regulations, requirements, and procedures. These include:

³ The SPS Agreement was negotiated during the Uruguay Round to address the concern that gains made during the round in negotiating freer trade in agricultural commodities could be eroded if countries substituted arbitrary or unjustified technical barriers to keep out imports. The agreement confirms that WTO members have the right to apply SPS measures to protect human, animal, or plant life or health. But such measures can be applied only to the extent necessary and must be based on sound scientific principles and (unless provisional) must not be maintained without sufficient scientific evidence. Furthermore, measures must not arbitrarily or unjustifiably discriminate among members. The agreement states further that all measures that conform to international standards, guidelines, or recommendations, as promulgated by the relevant international standard-setting bodies, are consistent with the relevant provisions of the agreement. But if a member's measure results in a level of protection higher than would be achieved by a relevant international norm, or if no such norm exists, the measure must be based on a risk assessment appropriate to the circumstances, reflect a consistent approach to risk management, and be the least trade-restrictive means of achieving the importing member's level of protection. Mechanisms are specified to ensure the transparency of member's SPS measures, and to reflect the special circumstances of developing countries. Disagreements among members can be resolved through the WTO's dispute settlement mechanism.

- i. Product criteria;
- ii. Processes and production methods;
- iii. Testing, inspection, certification, and approval procedures;
- iv. Quarantine treatments, including requirements associated with the transport of animals or plants, or with the materials necessary for their survival during transport;
- v. Provisions on relevant statistical methods, sampling procedures, and riskassessment methods; and
- vi. Packaging and labeling requirements related directly to food safety.

As the standards for the quality of the agri-products are constantly changing over time, the producers or exporters especially from the developing countries face difficulties for preparation with compliance. Also, exporters of those countries have to shoulder extra costs, which create uncertainty for them as well as for investors. For example, the total number of notifications of new SPS measures in the WTO increased from about 100 in 1995 to over 4600 in 2005 (Henson, 2006). The SPS agreement can thus be viewed as an attempt to discipline the seemingly never-ending demand for further regulation of the food system to protect public health (Henson & Heasman, 1998). But, at the same time, SPS measures may increase effective demand for the products to which they apply, to the extent, their use relieves consumers' concerns about the quality and safety of such products (Thilmany and Barret, 1997).

In addition, consumers' concerns have given rise to a number of certification or labeling initiatives. These standards apply to different levels in the food chain, and some reach down the commodity chain to producers. The following table identifies the key standards governing the African tropical and horticultural crops that are exported to the EU. And this implies that the main burden of the cost results from the need to comply with SPS measures for export products. The aim of compliance on the export side is not compliance for the sake of compliance, but as a means of improving market access and export expansion and development.

Р	Institution	Standards		
	World Trade Organization	Agreement on SPS		
	world Trade Organization	Agreement on TBT		
	Codex Alimentarius	Codex Standards, Guidelines and		
	Commission	Codes of Practice		
Internetional	Regional Coordination	Maximum Residue Levels of		
	Committee for Africa	Pesticides		
.	International Plant	International Standards for		
International	Protection Convention	Phytosanitary Measures (ISPM)		
agreements related to		ISO Standards on:		
trade and standards		Agriculture		
	International Standardization	Environment, health protection and		
	Organization (ISO)	safety		
		Food technology		
		Packaging and distribution of goods		
	Southern Africa	SADC Trade Protocol		
	Development Community	SPS/Food Safety Annex		
		Legislation on food safety		
Importing country rules		Legislation on crop protection		
	European Union	products		
		Legislation on phytosanitary		
		requirements		
	COLEACP (EU–ACP			
Producer protocols	stakeholders in horticultural	COLEACP harmonized framework		
	trade)			
	EurepGap Euro-Retailer	EurepGap (European Retailers		
	Produce Working Group	Protocol for Good Agricultural		
	British Retail Consortium	Practice)		
Trees outing firms?	(BRC)	BRC Protocol		
Importing firms		Global Foods Safety Initiative		
requirements (key		(GFSI)		
protocols applied)	Other retailer protocols*	Assured Produce Scheme (APS)		
	Other retailer protocols	Marks & Spencer Farm to Fork		
		Tesco's Nature's Choice		
		Shoprite		
Consumers'	Fair trada labaling	Fair-trade labeling organizations		
preferences	Fail trade labelling	International (FLO) standards		
		International Federation of Organic		
	Organia agricultura	Agricultural Movements (IFOAM) –		
		IFOAM Basic Standards (IBS) EU		
		organic standards		
International		HACCP (Hazard Analysis and		
Conventions, "codes of	EU/USA/FAO/Codex	Critical Control Point)		
conduct" or guidelines				

 Table 6.1: Inventory of Standards Applicable to African Fruit Exporters

Source : UNCTAD, 2005 (p 19)

Moreover, there are an increasing number of standards including standards set by international organizations, national governments or regional organizations, producers and retailers, and NGOs. The food industry has, therefore, to respond to the increasing demand for the products of ensured food safety measures, which are usually the parts of a general Quality Management System (QMS). These food safety or the QMSs can either be mandatory or voluntary. This research is also an analysis of the ISO 22000 food safety measure and costs associated with it based on the QMSs, which is practiced widely in the world market and that is equally a grave concerns for the developing and the least developed countries' export to the developed countries' markets.

6.1.2 Characteristics of the SPS Agreement

The main characteristics of the SPS agreement are such that, to be able to benefit from its implementation, requires complex, difficult and high cost SPS system involving regulatory measures, policy orientation and enhanced physical and knowledge capacity for implementation. The following are some explanations of the characteristics of SPS measures.

(i) Complexity and Wide Coverage: The stated objective of the SPS agreement is to protect human, animal, or plant life or health by taking any sanitary or phytosanitary measures necessary. Accordingly, the requirements and guidelines of SPS measures are diverse and complex entailing three sets of international standards provided by the so called three sister organizations: Codex Alimentarius Commission, International Plant Protection Convention (IPPC), and the Office of the International des Epizooties (OIE). They provide technical regulations for a vast number of activities in the supply chain of exports of agricultural products from input to production and harvesting, storage, transport, processing, packing and labeling, port facilities, and international transport. The implementation of the SPS agreement requires various scientific, technical, and legal skills and capacities. In addition to standards set by three sister organizations, governments of importing countries often have their own standards comprising a set of regulations. For example, EU has 24 regulations and directives (CTA: 2003). Further, there are a growing number of commercial (private) standards set by retailers in importing countries (Henson and Reardon, 2005) e.g. EurepGAP, Tesco, and British Retail Consortium (BRC). These standards are not only often more stringent than the official government standards, but they are less transparent than the official SPS measures as they are

not reported to WTO. Private firms have an incentive to set their own standards (Hatanaka et al.: 2005) not only to differentiate their products and create, or improve, reputation, but also to be able to choose the form of standards, as against public standards, to minimize their own costs (McCluskey: 2006).

- (ii) Changing Measures: The rapid change in SPS measures, regulations and notifications of new regulation is another factor which causes not only difficulties in preparation for the compliance, but it also imposes extra costs on exporters and creates uncertainty for them as well as for investors. In the case of an onset or an outbreak of disease importing countries may also give emergency notices. The total number of notifications of new SPS measures to the WTO increased from about 100 in 1995 to over 4600 in 2005 (Henson, 2006). During 1995- 2004, in the case of fruits and vegetables, it increased more sharply from 29 to 888, by over 30 times; for the tropical fruits and vegetables, exported mostly by developing countries, increases from 2 to 197 during the same period (Pay, 2005).
- (iii) **The Risks of Disguised Trade Protection:** Reputation in the observation and compliance with the regulations and standards is extremely important. If the importers discover deficiencies in a product originating from a specific country in their random inspection, they may impose a ban on imports of that product from that country. While the SPS measures are meant to protect health and lives of humans, animals and plants, the experience shows that the discovery of a case of deficiency with compliance may be used as an excuse for banning imports from a country. Therefore, an exporting country should be endowed with technical, scientific, and legal knowledge and information to be able to defend itself in a possible dispute case in WTO (Shafaeddin 2007).
- (iv) The Involvement of the Private Sector and the Difficulties of Coordination: In the supply chain, and in the control system, apart from the government, a number of actors in the private sector are involved, ranging from importers, farmers, dealers, traders, industrialists, exporters, owners of means of transports. In the public sectors, the implementation of the SPS measures touches a number of government organizations, including the ministries which deal with trade, industry, agriculture and rural development, health and transport as well as the custom authorities, the food and drug administration and control, and standard organizations.

6.1.3 Issues in Estimation of Compliance Costs

The costs of compliance with SPS measures are related to both imports and exports. Nevertheless, the burden of cost falls mainly on the export side for three main reasons. Firstly, the changes necessary for compliance with the standards of the importing countries is necessary for export expansion, irrespective of the membership of WTO. In other words, if SPS measures required by importing countries are not applied to exports, the exporting country would lose its market in those countries whether it is a member of WTO or not. The only difference is that after the accession to WTO, the application of SPS measures becomes a legal obligation for the contracting parties. Secondly, by contrast, according to the SPS agreement, applying standards to imports are not obligatory, but if technical regulations are applied to imports they should confirm with international standards or related rules of SPS and be applied equally to similar domestic products. Thirdly, for the accession to WTO, with few exceptions, requirements for imports are the same as that of exports.

Several issues are to be taken into consideration while estimating the costs imposed on businesses due to technical standards and conformity assessment procedures in export markets. The approach adopted is to survey businesses directly about the costs of compliance with requirements in different markets. There are, however, a number of issues that should be borne in mind when interpreting the results.

- (i) Direct and indirect costs of compliance: A distinction can be drawn between direct and indirect costs of compliance. Direct costs are associated with the primary purpose of technical standards and/or conformity assessment procedures, whereas indirect costs result from side effects not directly related to the purpose of these requirements. For example, the direct costs of compliance with a requirement to include particular information on a product label might include label redesign. The indirect costs might include product reformulation in response to the requirement to label the product in this manner.
- (ii) Recurring and non-recurring costs: A further distinction can be made between non-recurring and recurring costs of compliance. Non-recurring costs refer to one-off items of expenditure that are required for initial compliance,

for example, investment in new capital. Recurring costs are associated with more permanent increases in operating expenditures, for example, product testing requirements. The distinction between recurring and non-recurring costs suggests that account must be taken of the stage in the compliance process that costs are measured. Further, it is generally accepted that recurring and non-recurring costs can impede trade in a somewhat different manner (Henson, 1997).

- **Unavoidable costs:** A distinction can be made between unavoidable (iii) (mandatory) and avoidable (voluntary or discretionary) compliance costs (Sandford et al, 1989). Unavoidable costs are those necessarily incurred if the business is to meet legal requirements specified in an export market, whilst avoidable costs are those costs which businesses choose to incur in the process of compliance. There is some debate about how to handle avoidable costs. Some suggest that since avoidable costs are voluntary, they should be excluded from compliance costs, whilst others suggest even discretionary costs should be included since they remain a product of the regulation (Henson, 1996). Disentangling the unavoidable or necessary costs of compliance from avoidable costs can be problematic. In many instances, firms utilize the changes required to comply with technical standards to institute other changes that may not be directly required to achieve compliance. For example, firms may utilize a requirement to include certain information on a product label to redesign their entire product label. In this case, should the cost of compliance be the total cost of the label redesign, since the firm would not have otherwise made such changes, or simply the additional cost of the label redesign, due to the requirement to include certain information?
- (iv) Efficiency in compliance: Compliance costs will depend on the extent to which firms comply with technical requirements in the most cost-effective manner. This raises the question of whether compliance costs should be measured on the basis of what firms actually do, given prevailing market forces and imperfect information, or should be measured on the basis of the most efficient method of compliance, whatever this might be.

6.1.4 SPS Imposes Costs

The precise socio-economic costs and the impact of the implementation of SPS is not easy to measure and studies undertaken so far have not been able to go beyond certain rough estimates as a number of hypothetical and unquantifiable factors are involved. While there is general agreement that food safety and agricultural health measures do indeed strongly impact international agro-food, there is no consensus on the relative importance of individual measures and in relation to other trade distorting measures, nor their aggregate net effect(Jaffee and Henseon, 2004) Nevertheless, the experience of developing countries and the results of studies under taken, particularly on least developed and/or other low income countries, lead us to the following points.

- i. The burden of the cost of compliance is imposed on exporting countries.
- ii. The cost of compliance is relatively high in relation to the income level of the low income and the least developed countries and resources available to them.
- iii. While the cost of compliance is high, the short and long-run costs of the lack of compliance is enormous, in terms of the loss of foreign exchange, income, employment and household consumption, particularly in rural areas.

The cost and efficiency of compliance depend, inter alia, on the organization of the supply chain. Before explaining some of these issues, it seems essential to raise a few conceptual concerns.

From an economic standpoint, the costs of compliance are the costs that are necessarily incurred by a business to comply with standards. These costs may include adapting the product to meet local requirements and/or undertaking conformity assessment procedures both prior to export and/or at the port of entry. Measures of SPS standards as a nontariff barrier (NTB) can be based on how a given regulation affects the overall equilibrium in the sector, or in the economy.

Scant evidence is available in the literature on costs of compliance with SPS measures. Most often, however, costs resulting from the delay in exports, or the rejection of the product at the port of the importing country, due to the lack of compliance are disregarded, let alone the most important costs related to the need for the reorganization of the supply chain. Nonetheless, it is argued that for poor countries, the compliance with SPS measures is not only difficult but it is also costly, in relation to their export earnings, and per capita income level; even when judged on the basis of the underestimated cost. This suggests that their capacity for compliance is limited, such difficulties and cost results in slow export expansion in the absence of compliance.

A Case of Agri-food Safety and SPS Compliance in Guinea, Mozambique and Tanzania

1. Background

In 2005 UNCTAD conducted a study on the cost of agri-food safety and SPS compliance in Guinea, Mozambique, and Tanzania. This study intended to identify and quantify the compliance costs for tropical fruits faced by a group of African LDCs. It presents a framework that facilitates estimation of costs of compliance for exporters that are associated with agricultural safety standards and SPS. These costs of compliance are understood as additional costs incurred by exporters in meeting the requirements laid upon them in complying with a given regulation in the importing country. Moreover, compliance with agricultural standards and SPS in export markets can also impose costs on public institutions.

The study focused on three African LDCs selected as case study countries (Tanzania, Mozambique and Guinea Conakry) and was prepared in co-operation with producers, exporters, business bodies, enterprises and institutions. It is expected to contribute to the formulation of concrete recommendations for capacity-building to ensure the compliance of production and distribution systems in the countries concerned. National workshops are taking place based on the findings stemming from the studies undertaken in the three selected countries. In Tanzania and Guinea, exporters have already seen their produce rejected due to lack of compliance. Standards may indeed constitute an ever growing obstacle to exports from developing countries as the number and scope of the requirements increases. Given the nature of the standards, which set requirements from "field to fork", compliance involves all actors in the food chain including producers, pickers, distributors, and exporters.

2. Key Findings

The cost estimates presented in this study are only valid under a particular set of assumptions. The most important results are the cost enquiry grids developed which are useful tools for (i) each institution to analyze in detail its own requirements and compliance costs; and (ii) private producers to identify the requirements of EurepGap and to estimate how much it would cost them to meet these requirements.

Macro costs

These are the costs incurred by public and semi-public agencies and include costs of legislation development, training, infrastructure and equipment upgrading, inspection, testing, and other monitoring and control mechanisms. The cost enquiry grids for public institutions define (i) the key components that should be present in a Food Control System; (ii) the activities that need to be carry out to implement these components; and (iii) the inputs needed to carry out these activities. Table below summarizes these costs:

Country	Organization	Costs (US\$)
	TBS	870,000
TANZANIA	Ministry of Agriculture: Plant Health Division	1,090,000
	Ministry of Health: Department of Environmental Health	560,000
	Total Costs	2,520,500
	INNOQ	5,590,000
MOZAMDIOUE	Ministry of Agriculture: Plant Health Division	2,840,000
MOZAMBIQUE	Ministry of Health: Department of Environmental Health	820,000
	Total Costs	9,250,000
	INNM	670,000
	Ministry of Agriculture: Plant Health Division	1,555,000
	Ministry of Health: Department of Environmental Health	570,000
GUINEA	Division of Production	200,600
	Division of Seed and Seedlings	1,380,000
	CRAF	1,485,000
	CFC	76,000
	TOTAL COSTS	5,936,600

Summary of Maci	o Costs of Com	pliance in Tan	zania. Mozamb	ique and Guinea
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Micro Costs

Firm-level "micro" compliance costs are the costs incurred by producers and exporters in order to comply with demands of importing countries and private clients. At the same time that international and national regulation becomes more stringent, the private sector in importing countries is also setting its own standards. These include changes in producing systems, infrastructure construction and upgrading, training, consultancy services and certification costs. This study has focused on the costs of compliance with the EurepGap protocol, due to its comprehensiveness and wide acceptance.

Summary of Micro Costs of Compared in Tanzana, Mozano que and Compared									
EUREPGAP	TAN	ZANIA	MOZAI	MBIQUE	GUINEA				
REQUIREMENTS	Setup	Ongoing	Setup	Ongoing	Setup	Ongoing			
NEQUINEMENTS	costs	costs	costs	costs	costs	costs			
1. Traceability	4,300	100	4,300	100	4,500	100			
2. Record Keeping And Self-	6 000	2 600	7.000	2 200	5 000	2 500			
Inspection	0,000	5,000	7,000	5,500	3,000	5,500			
3. Propagation material	0	0	0	0	50,000				
4. Site Management	900	0	900	0	0	900			
5. Risk Assessments	1,500	300	1,500	300	1,500	300			
6. Technical Services	0	2,000	0	2,000		2,000			
7. Laboratory Analysis	0	3,000	0	3,000	5,000	5,500			
8. Soil And Substrate Management	1,000	100	1,000	100	300,000				
9. Fertiliser Use	2,500	750	7,500	1,000	200,000	300			
10. Crop Protection	10,400	1,250	23,900	2,200	210,000	1,500			
11. Irrigation/Fertilization	600	0	600	0	300,000	400			
12. Harvesting	9,800	200	12,000	800	5,000	500			
13. Produce Handling	11,300	100	11,300	600	1,000,000	15,000			
14. Waste & Pollution	800	50	5,800	300	300	0			
Management									
15. Worker Health, Safety And	47 400	4 250	28 500	6 100	0.000	8 000			
Welfare	47,490	4,230	28,300	0,100	9,000	8,000			
16. Environmental Issues	1,100	200	1,100	200	1,000	1,000			
17. Certification Costs	1,000	2,000	4,000	1,000	10,000	5,000			
18. Eurepgap Procedures	0	2,600	0	2,600	900	2,000			
19. Establishment of farmers	0	0	0	0	90,000	6.000			
organization	0	0	0	0	90,000	0,000			
20. Establishment an Inter-									
professional Confederation of food	0	0	0	0	60,000	4,000			
chain actors									
21. Train intermediary food chain	0	0	0	0	6.000	1.000			
actors	0	•	0	0	0,000	1,000			
TOTAL COSTS (USD)	98,690	20,500	109,400	23,600	2,197,200	27,000			
Source: Abstract from Costs of	f Agrifoo	d Safety an	d SPS Co	mpliance, U	JNCTAD, I	DITC			

Summary	of Micro	Costs of	Compliance in	n Tanzania	Mozambio	me and Guinea
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There are two basic approaches to estimate the additional costs for business associated with divergent national product standards and conformity assessment procedures:

- (i) Macro approach, whereby the additional costs are estimated indirectly through inter-country variations in market prices, given differences in product standards and/or conformity of assessment procedures.
- (ii) Micro approach, whereby the additional costs are estimated directly given the specific requirements imposed on businesses by product standards and/or conformity assessment procedures in different countries.

The macro approach has been most widely applied by studies that have attempted to estimate the total cost associated with divergent technical standards and express it as a tariff rate equivalent (Baldwin, 1991). This approach, however, is dependent on the ability to isolate the impact of differences in product standards and/or conformity assessment procedures from other influences on market prices. In the case of products that are subject to numerous and complex technical standards and other market-based influences, this can be difficult. But in developing and the least developed countries, the macro costs involve those types of costs that are involved in improving food safety control system, developing appropriate standards and legislation, building up systems for assessing conformity to standards, training staff and promote standards, improving information flows, developing effective mechanisms for the control of imported and exported produce, and improving participation in international standards setting (Table No 4.2).

Organization	Objective		
TBS	Review and update legal framework		
	Develop standardization capacity		
	Develop Certification Capacity		
	Promote implementation of quality standards		
	Improve Participation in International Standards Setting		
	Recruitment		
Ministry of	Review and update legal framework		
Agriculture	Develop capacity to deal with SPS issues		
Plant Health Division	Develop inspection and quarantine capacity		
	Develop Export certification capacity		
	Strengthen information, surveillance systems		
	Modernize procedures for registering and control of pesticides		

 Table 6.2: Macro Costs of Compliance

	Promote implementation of quality standards		
	Improve Participation in International Standards Setting (SPS)		
	Upgrade infrastructure to allow efficient implementation of		
	phytosanitary systems		
	Recruitment		
Ministry of Health	Review and update legal framework		
and	Develop inspection capacity		
Ministry of	Improve information systems		
Environment Promote Implementation of safety standards			
	Improve participation in international standards setting		
Infrastructure development			
	Recruitment		
Total Costs			

Source: Field Study 2010-11and UNCTAD 2005.

Likewise, micro approach involves identification of the specific changes and procedures businesses are required to undertake to satisfy standards and demonstrate conformity in specific national markets as shown at table 6.3 (Henson, 1996; 1997).

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	ISO 22000:2005 Requirements	Inputs	
1	Traceability system	Stationery/forms, Sign posting (label & stickers) Mapping, Computers (hardware and software) Building	
2	Document & record keeping & self- inspection	Develop record-keeping sheets, Hire personnel to complete them, Build office, Consultancy services, FSMS team	
3	Site management	Consultancy services	
4	Risk assessment	Technical services for risk assessment – outsourcing	
5	Technical services	Hire specialized staff	
6	Laboratory analysis (laboratory accredited to ISO 17025 or equivalent standard)	Laboratory analysis	
7	Soil and substrate management	Consultancy services Seeds and other materials	
8	Fertilizer use	Services of a specialized company, Build storage Maintenance costs	
9	Crop protection	IPM training, Acquire machinery & sprayers Services of a specialized maintenance company,	

		Build chemical store, storage, chemical disposal site, Buy equipment, Special machinery, Support national program to dispose of obsolete products
10	Irrigation/fertigation	Consultancy services
11	Harvesting & pruning	Build storage for produce , Temporary holding shades, Main holding shade withering, Costs of labeling
12	Produce handling	Packing house, Build storage
13	Waste & pollution management, recycling and re-use	Consultancy services Build waste disposal facilities Water treatment facilities
14	Worker health, safety and welfare	Training course, Build toilets, hand-washing facilities, shower facilities, Changing room, Garments for workers First aid kits Fire extinguishers Signs Build storage Buy personal protective equipment Medical care Build quarters for workers
15	Environmental issues	Environmental consultancy services Training Costs of corrective actions
16	Certification	Certification assessment
17	ISO 2200 procedures (PRP, OPRP, HACCP PLAN, & other relevant document required by the ISO 22000:2005	Hire specialized staff and train in ISO 22000:2005 procedures
18	External communication	Resource material (computer, mobile and other accessories, National standards follow-up
19	Internal communication	Technical requirement Resource requirement Resource requirement

Source: Field Study 2010-11 and Cao 2005.

Therefore, a good understanding of the compliance process within individual firms is required. The costs of compliance with standards are estimated on a case-by-case basis using actual or reported cost data. Whereas the micro approach is demanding in its data requirements and more costly to perform, the results are generally more reliable and can be related back to the characteristics of particular standards and conformity assessment procedures which act as the greatest impediment to trade.

A Case of European Union 1997 Seafood-Safety Ban: The Economic Impact on Bangladesh Shrimp Processing (The Cost of Lack of SPS Compliance)

Cato and Santos in 1998 conducted a study on the European Union 1997 Seafood-Safety Ban: The Economic Impact on Bangladesh Shrimp Processing. Bangladesh relies mainly on its inland fishery resources, including aquaculture, for domestic consumption and exports. Cultured shrimp is estimated to be about 4 times that of captured shrimp in export quantity. Shrimp represent about 90% of the value of Bangladesh's marine product exports. Shrimp and prawns exported from Bangladesh are almost entirely in block frozen form. Bangladesh depends on three major markets for frozen shrimp exports. The EU has been the leading importer of Bangladesh shrimp from 1989 to 1991 and 1994 through 1996, the most recent year for which comparable data are available. The EU accounted for 34%, 40%, and 50% of total Bangladesh frozen shrimp exports these three years. The U.S. was slightly ahead in 1992 and 1993, second to the EU all other years, and imported 38%, 32%, and 23% of all Bangladesh shrimp from 1994 to 1996. Japan has gradually increased its share, with 18%, 15%, and 26% from 1994 to 1996. Total value of Bangladesh frozen shrimp imports into these three markets reached a maximum of US\$287.6 million in 1996 with the U.S. accounting for US\$109.6 million, the EU US\$108.8 million, and Japan US\$69.2 million.

2. Safety and Quality Problems

Shrimp processed for the world market must be produced to meet minimum international standards. Standards followed should be consistent with those specified by the Codex Alimentarius Commission. The product must also meet buyer specifications and be produced to comply with regulatory requirements of the importing country. Meeting minimum standards and buyer and importing country regulations on a consistent basis also creates a good reputation for products from the exporting country. Bangladesh has a reputation for producing seafood that sometimes does not meet the required standards of SPS quality. As in other developing countries, major constraints in Bangladesh include a lack of sufficient funds with which to invest in expensive mechanical equipment, fishing boats, pond grow-out facilities, buildings, and trained personnel. Insufficient and irregular supplies of electricity, inconsistent availability of high-quality water and ice, and poor transportation facilities also hinder the use of modern sanitary practices. Major quality problems begin mainly in preprocessing operations. This includes the handling of raw shrimp (sorting by size and color, removal of heads or peeling) in small plants, sheds, houses, or available open spaces, often under conditions and in facilities unsuitable for food handling. Additional problems incurred during the actual processing at the plant level also often contribute to the SPS quality of processed shrimp traded in world markets.

3. European Commission Safety-Related Import Ban

On July 30, 1997, the European Commission banned imports of fishery products from Bangladesh into the EU as the result of European Community inspections of seafood processing plants in Bangladesh. The concern resulted from serious deficiencies in the infrastructure and hygiene in processing establishments and because there were not enough guarantees of the efficiency of the controls carried out by the competent authorities (Bangladesh government inspectors). The European Commission determined that consuming fishery products processed in Bangladesh posed a significant risk to public health. Subsequent inspections and decisions recognized the Bangladesh Department of Fisheries, Fish Inspection and Quality Control, Ministry of Fisheries and Livestock. They also indicated that Bangladesh quality assurance legislation was equivalent to that of the EU. Subject to certain provisions, the ban was lifted on seafood product imports from Bangladesh for six approved establishments for products prepared and processed after December 31, 1997.

1. Effect of the European Commission Safety-Related Ban

The effect of the European Ban on the Bangladesh frozen shrimp processing industry can be measured in two ways. First, secondary data that are available from published sources, and on-going data collection programs from which cost estimates due to the ban can be determined. Second, survey results from shrimp processing firms in Bangladesh also provided data from which cost estimates can be made for some inputs on a per-plant basis. Since Bangladesh has become increasingly dependent on the EU as a market for its frozen shrimp, a complete ban on imports to this market can be expected to create economic consequences. Secondary data were used to determine the volume of Bangladesh shrimp exports from August to December 1997. This data did not include shipments to the EU. Bangladesh imports were purchased by the United States, Japan, and all other countries grouped as one market segment. An estimate was also made of the volume and value of Bangladesh shrimp exports if the European Commission ban had not been in effect. This estimate was based on both actual 1997 data and historical 1993 to 1996 trading patterns. The difference in value of export sales "with" and "without" the European Commission ban was the economic cost of the ban to the Bangladesh shrimp processing industry. It is possible to track movements of frozen shrimp exports from Bangladesh to the other two major markets (the U.S. and Japan) during the total ban between August to December 1997.

Estimates of the Net Effect on the Bangladesh Frozen Shrimp Exporting Industry and
the Major Importing Markets due to the European Union Ban on Bangladesh Seafood
Exports in mid-1007

Importing Region	Without Ban	With Ban	Net Effect *			
United States	73,469.7	102,189.9	28,720.0			
European Union	65,063.3	0	-65,063.3			
Japan	22,676.6	26,065.4	3,388.8			
All others	7,543.3	25,832.3	18,289.0			
Total (to Bangladesh)	168,752.7	154,087.5	-14,665.2			

Note: * From August to December 1997. Values are in thousands of dollars (U.S.)

Since seafood from Bangladesh was not allowed into the EU between August and December 1997, frozen shrimp exports to that market was zero. During the time of the European Commission ban in mid-1997, the U.S. was the highest-value market, and shifts of product to that market created an increase in revenues over likely values that would have been received had the product gone to the EU market. Product shifted to minor markets due to the ban would be expected to receive a much lower price. However, this is offset some by the fact that the diverted product would be of higher quality and lower-count size (than normally sent to those markets) and, thus, would bring higher prices than normal in these markets if the market could absorb the product. Using estimated sales "with" and "without" the ban, it was determined that the European Commission ban caused Bangladesh frozen shrimp processors to receive US\$14.6 million less in revenues during the August to December 1997 period. Anticipated lost sales in the EU of US\$65.1 million were offset by only US\$50.4 million in increased sales in other markets, or a decline of 8.7% from levels anticipated without the ban.

6.1.5 Variations in Costs of Compliance

Information on the costs of compliance is scanty, particularly if it comprises many elements related to various activities in the supply chain. Further, the costs of loss of income due to delays in exports, or rejection of the product at the port of import, and reorganization of the supply chain are not often included. Nevertheless, even then the available incomprehensive evidence suggests that it is high, in relation to exports, particularly for small firms/holdings in low income countries. The operational costs of the compliance with SPS alone represent overhead of between 2 per cent and 10 per cent of value of products exported by the vast majority of ACP countries (CTA, 2003). Further, the impact of SPS agreement on market access of many ACP countries, particularly in Africa, has been negative and the fisheries sector of the region has suffered more than other sectors. However, no quantitative measure of social loss is provided beyond arguing that the higher is the share of agriculture in GDP and employment and exports as well, the higher will be the costs due to the loss of exports (CTA.2003). Similarly, a study on India indicates that the potential losses to India from strictness of the standards set and from the variation in the standards among the seven export destinations (main developed countries) are enormously high (Jayasuriya et. al 2006).

The wide range in the estimated costs by ACP indicates that no general rule can be drawn for the costs of compliance. It depends, inter alia, on the type of products exported, the destination of exports, the size of firms and the capacity of the country for compliance and the organization of the supply chain. To begin with, when a country is an exporter of sensitive products, it is often subject to the risk of rejection by importing countries. At the global level, fish and fishery products, meat and dairy products, fruits, vegetables and their products and nuts and spices, animal feed and grain, tropical beverages, Oil seeds, textiles fibers, drinks, tobacco/cigarettes, sugar and confectionery, and other processed products have been the most important products impacted by border rejection based on technical standards during 2000-01 (Shafaeddin, 2007).

The destination of exports also affects the cost of compliance as importing countries have different standards. Developed countries, particularly, the EU, imposes

the most stringent SPS measures on imports. For example, the negative impact of the difference between the 1998 harmonized EU standard for maximum level of Aflatoxin and that of the Codex international standard, accepted by some other countries, on African exports of cereals, fruits, vegetables and nuts estimated to be US\$670 million (Lacovne, 2004:31). Further, the cost of compliance is imposed not only on the governments, but also on the private operators involved in production and exports. For example, the EU's new regulation requires the implementation of HACCP for control of hygiene and the adherence to Codex rules throughout the supply chain by the exporters because it is assumed that the private operators have the primary responsibility for food hygiene. The principles of HACCP include: analysis of hazards; identification of critical control points; establishment of prevention measures; establishment of monitoring procedures; establishment of corrective actions; establishment of procedures to verify that the system is working properly and, the establishment of record keeping documenting system. These requirements necessitate investment by the private operator in the exporting countries as EU requires pre-approval of all establishments involved in production and exports.

The UNCTAD provides rough estimates of the cost compliance for various functions related to the control of a product at the end of the supply chain. Table 6.4 provides estimates of costs of various activities necessary for compliance of an African country with SPS measures at 2003 prices. This estimate, however, excludes the operational costs.

Activity	\$(1000)
To strengthen the institutional framework	56
To update the legal and regulatory framework	76
To upgrade and rationalize inspection services	604
To upgrade the scientific and technical capabilities of	1,505
labs	
To train quality control managers	120
Total at country level	2,391
Additional cost of Regional activities	6245

 Table 6.4: Cost of various initial activities for the compliance with SPS

 Agreement in Mozambique

Source: CTA (2003)

Table 6.5 provides some estimate for establishing quality and certification for Ethiopia. The estimate, however, does not include the private costs as well as the operational costs for the public sector.

Table 6.5: The Cost of a Program for Establishing Quality Control andCertification System for Agricultural Exports of Ethiopia

Component	Cost(\$US)
Institutional & legislative reform	838,598
Capacity building in conformity assurance for GOE organizations	5,569,248
Regulation of conformity assessment	2,621,210
Capacity building of Ethiopian certification companies	211,056
Capacity building for certification in niche markets/special schemes	197,058
Total	9,925,507

Source: Adopted from Shafaeddin (2007)

Likewise, table 6.6 shows the cost of compliance for the tropical fruits for a couple of African countries. Such costs are enormous in relation to the related export items of the countries concerned.

 Table 6.6: Cost of Compliance for Some African Countries for Tropical Fruits (US\$)

Country	Public	producers and private sector		
		Initial	operating	
Tanzania	2,520,500	98690	20500	
Mozambique	9,250,000	109,400	23600	
Guinea	5,936,600	2,197,200	27000	

Source: UNCTAD (2005)

The cost of upgrading of the fish plants does not seem to be significant in the case of Bangladesh and Nicaragua (table 6.7). However, in countries where little facilities for fish processing exist, the cost could be colossal.
Table 6.7

Processing in Bangladesh and Nicaragua					
Country	Cost of upgrading (% of	Maintenance (% of annual			
	base year X)	exports)			
Bangladesh: 1996-	2.3	1.1			
2008					
Nicaragua: 1997-	0.61	1.26			
2002					

The Cost of Upgrading for Compliance with SPS Measures for the Fish Processing in Bangladesh and Nicaragua

Source: adopted from Shafaeddin (2007)

The capacity to comply, of course, depends on the level of development of a country. The lower the level of development, the lower is the capacity. Often more sensitive products, e.g. fish, are also the most demand dynamic products in international trade (Shafaeddin: 2007). Thus the lack of necessary capacity for compliance cost low export growth. The organization of the supply chain and the size of farm holdings and firms involved in exportation also affect the unit cost of compliance; the more fragmented the supply chain and the smaller the size of farms and exporting enterprises, the higher is the unit cost of compliance.

6.1.6 SPS Measures that Affect Trade and Development

SPS measures, trade, and development are increasingly interconnected. Developing countries are large exporters of agricultural and food products, taking advantage of their abundant low-cost labor. Recent liberalization of global trade including reduction in agricultural tariffs and elimination of quotas has expanded export opportunities for many of these countries. But their inability to conform to SPS measures required by trading partners hampers their ability to take advantage of these opportunities. At the same time, SPS policies will likely become more complex and enforcement more stringent as trade becomes more liberalized.

To become and remain competitive, producers and suppliers must meet the SPS requirements set by importers' governments and by distributors and retailers in importing countries. Failure to meet government requirements prevents products from entering a market altogether. This has immediate and potentially serious repercussions for all stakeholders, producers, suppliers, buyers, foreign and domestic governments,

and consumers and severely affects industries that depend wholly on specific markets. Producers and suppliers that are able to implement SPS measures earn the trust and recognition of the importing country, potentially benefiting many stakeholders. For example, in 1999, the EU imposed a ban on Lake Victoria fish imports because of suspected toxic contaminants. As a result, approximately 200,000 people in Uganda, Tanzania, and Kenya who earned a living from fishing, processing, and supplying Nile Perch lost their jobs while factories closed or operated at minimum capacity. After improvements were made in the fish production chain, including introduction of a fish safety assurance system and the HACCP system, the EU lifted its ban in late 2000. Uganda, Tanzania, and Kenya not only recaptured their market share in the EU, but also were able to expand fish exports to the United States and other markets4.

Producers and suppliers must also meet the requirements of private sector distributors and retailers. Buyers can help producers and suppliers in developing countries meet the quality, safety, packaging, and labeling requirements of export markets, as well as domestic markets. In many developing countries, McDonald's fast food chain, for example, buys locally produced goods and works closely with producers and suppliers to ensure that purchased inputs meet the corporation's high standards for quality and safety. Similarly, large supermarket chains are increasingly requiring domestic and overseas suppliers to maintain systems and procedures that can ensure that quality and safety specifications are reliably met (Shafaeddin, 2007).

In addition, more food exports from developing countries consist of processed food products. This means that developing countries are leveraging their comparative advantage in low-cost labor during processing to become more competitive in global markets. Producers and suppliers that can respond to international SPS measures would find it easier to expand into other markets, potentially gaining a competitive advantage over those who do not meet SPS requirements (e.g., as was the case with Lake Victoria fish exports).

Failure to adopt SPS measures, in particular those based on international norms, can significantly inhibit trade. The World Bank has found that Africa could

⁴ United Nations Industrial Development Organization (UNIDO). Lake Victoria – Good Fish, brochure retrieved from www.unido.org/userfiles/timminsk/ECOSOC-hrd-UNIDO.

gain more that \$1 billion each year from increased exports of nuts, dried fruits, and other agricultural commodities if it developed and implemented international standards. If South Africa adopted science-based international standards for minimum residue levels of veterinary drugs, it could boost beef exports by \$160 million a year. Alternatively, if the EU applied the Codex international standard for residues of the pesticide chloropyrifos, rather than the more stringent EU standard, developing countries could boost their banana exports to the EU by \$5 billion (ibid).

Failure of SPS control regimes in developing countries can severely damage the domestic economy or human health, or both. Developing countries need only look to the huge losses suffered by developed countries in the last decade. The Netherlands suffered an outbreak of classic swine fever and the United Kingdom, mad cow disease and foot and mouth disease (FMD). Several countries in South America and North Asia experience recurrent breakdowns in control of FMD (ibid). Other important development objectives including protection of the health of humans, animals, and plant life are more likely to be accomplished by strengthening developing countries' SPS regimes.

6.2 Quantification of SPS Compliance Costs to Orthodox Tea

This segment has attempted to measure the costs of quality compliance of Nepalese Orthodox and organic Tea as case study among exportable commodities within the SPS framework, which has become a mandatory compliance in WTO regime.

In recent years, agricultural exports to developed-country markets have emerged as a potentially major source of export growth for many developing countries. Exploiting this potential, however, poses many challenges. The capacity of developing country exporters to enter these markets depends critically on their ability to meet stringent food safety standards imposed by developed countries. Not only are these standards stringent, but they are increasingly so. They now go well beyond traditional quality standards, as suppliers must pay closer attention to the responsible use of agrochemicals, energy, water and wastes, as well as social and environmental impact. These standards are significantly higher than those prevailing in developing countries, they are subject to frequent changes and are, ultimately, often difficult and costly to meet. It has to be noted, however, that the globalization of markets and the acceleration of technological changes has led to a definite redirection by most developed countries in their food control organization. Governments and economic agents in developed countries are also having to invest heavily in the reform of their food control systems (UNCTAD, 2005). In some developing countries, however, and particularly in some African cases, the levels of difficulty and cost are heightened by the lack of legislation, lack of facilities to implement food legislation (regulatory infrastructure and laboratories), lack of trained people and lack of funds to strengthen such systems (ibid).

This segment aims to identify and quantify the compliance costs for highland orthodox tea faced by Nepalese tea producers and exporters in compliance with the ISO 22000. This segment has also presented a framework that facilitates estimation of costs of compliance for exporters that are associated with agricultural safety standards and SPS. These costs of compliance are understood as additional costs incurred by exporters in meeting the requirements laid upon them in complying with a given regulation in the importing country.

As against the backdrop of the stringent SPS standards set by developed countries markets, coupled with the lack of technical and economic resources of developing countries to participate in standard setting process have limited access to developed countries markets, a growing concern has taken, in the recent years, its momentum among Nepalese orthodox tea producers and exporters to implement quality compliance measure such as ISO 22000 to their products. ISO 22000 implementation, being a relatively new concept and the costs associated with it being somewhat amorphous in nature, this researcher had asked specific questions in the questionnaire to elicit importance of various cost items, and the rupee amounts of two types of cost, namely, set-up cost and operating cost.

6.2.1 Approaches to Analyze SPS Costs

To analyze costs of quality standards, three different approaches have been proposed in literature, namely the engineering, the accounting and the econometric estimation.

(i) Engineering Analysis Approach

The engineering analysis approach bases the estimation of costs of improvements in food quality and safety on the analysis of cost data available from existing sources, considering the individual elements required by the improvement process. For example, if compliance requires construction of new plants, investments in equipment, training, testing regimes, and re-work strategies, then the overall cost is calculated as an aggregate of existing cost data that could be associated with these individual elements (Jensen & Unnevehr, 2000). The production and cost functions are used to represent the processes and to identify a desired level of safety or, alternatively, to comply with a particular regulation. Examples of applications of this approach include the 'Final Regulatory Impact Assessment' studies on the cost of compliance for mandatory adoption of HACCP in the seafood, meat, and poultry industries in the United States Food and Drug Administration (FDA), 1995; Food Safety and Inspection Service (FSIS), 1995, 1996.

Engineering cost analyses are usually considered as transparent (i.e., precise and easy to understand) and reliable, as they usually build on new or existing real cost data. However, they also have their limitations, especially in cases where data is not available or regulations do not specify particular actions that enterprises would have to take. As an example, the adoption of quality standard approach builds on the implementation of regulations that specify overall process control, but leaves individual implementation decisions to the firm. However, in engineering cost estimation the specification of implementation decisions is a necessity. As a consequence, the quality or reliability of engineering cost estimations depends on the ability of the analyst to obtain appropriate data and predict enterprise actions.

(ii) Accounting Approach

The accounting approach measures the cost of improvements in food quality and safety through structured surveys among companies. This direct involvement of those costs and their experience in estimating them is a major advantage of the approach. However, the quality of the analysis hinges on the quality of the survey. The survey design must be based on a comprehensive knowledge of the range of activities that the firm may have used, in order to ensure that the right questions are asked and the right information obtained.

Furthermore, analysts have frequently found that plant level managers are able to enumerate the inputs and outcomes of safety enhancement actions, but may have difficulties to estimate the associated costs. Under such circumstances, the analyst may use market data (costs of machinery, hourly labor costs, etc.) to estimate overall costs. A shortcoming of the accounting approach is its focus on 'ex-post' evaluations which makes it less suitable for 'ex-ante' planning and decision support. Yet, it does illustrate the nature and extent of costs actually incurred by firms. A further challenge to survey-based estimates is that the approach is time consuming, often resulting in small sample sizes, a fact that may raise doubts about the relevance of results.

Colatore and Caswell (2000) used the accounting approach to assess the costs of HACCP adoption by fish producers in Massachusetts. The study revealed the difficulty in cost estimations. HACCP was required by FDA for seafood since 1997, but the level of implementation in individual enterprises varied widely. The differences arose because companies adopted plans that went beyond the FDA requirements; some companies had or would have adopted HACCP without the government directive. HACCP adoption allowed some companies to drop alternative quality certification systems. The authors had to distinguish between the companies' overall costs of HACCP, the costs of HACCP adoption attributable to the government requirements and the marginal costs for reaching those requirements. The first two scenarios provide global estimates of the voluntary and mandatory costs of adopting HACCP as an approach to quality assurance in the industry, while the third one would be more appropriate for a regulatory impact analysis.

Romano et al. (2005) analyzed the costs of HACCP system implementation in the dairy and meat processing industry. Their results indicated a correlation between the size of a firm and the costs, an observation that was supported through a study by Nganje et al. (1995) in the meat sector which showed differences of up to 60 percent. Further studies on the estimations of costs attributed to quality systems were published by Zugarramurdi et al. (2000), Nganje & Mazzocco (2000), Nicholls & Venoutsos (2001) who focused on the quality system 'SQF 2000', and Mora & Menozzi (2002), who dealt with the costs of traceability.

(iii) Econometric Estimation

The econometric estimation approach uses models of plant costs to estimate the costs of quality and safety improvements (Antle, 2000; Ollinger & Mueller, 2003). Large industry with wide data sets with plant level variables are used to estimate effects and their interdependencies with variables like plant size and others.

A major strength of the econometric cost estimation approach is that it captures the experience of entire industries, using uniformly collected data at a detailed plant level. The use of statistical procedures allows for the control of other important variables, yielding reliable measures of marginal impacts. A drawback of the approach is that available data sets, such as those maintained by Census Bureaus, frequently do not include variables that directly capture efforts, costs, and outcomes related to improvements in quality and safety.

Among the studies dealing with the relationship between costs and the size of enterprises, Ollinger and Mueller (2003) analysis is particularly of interest. The authors analyzed costs of sanitation and process controls of plants producing meat and poultry in the United States in the late 1990s, prior to the adoption of mandatory pathogen reduction and HACCP controls. They found that these controls increased overall production costs with little variation because of plant size. Econometric studies at the farm level include Velthuis et al. (2004), who identified cost advantages for medium sized farms.

6.2.2 Reliability Test of the Data

Before assessing the simple regression estimations, this study has attempted to test the reliability of data since they are drawn from the primary source. For this, this segment has attempted to run the data in Cronbach's Alpha reliability test. The test has been run here to find out the reliability of collected data regarding the costs of compliance

from the field study, which shows that the data collected seems to be reliable with Cronbach's Alpha coefficient of 0.813.

	Cronbach's	Alpha	No. of Items			
	0.813479	23		19		
	Ite	em-Total Statisti	cs of Cronbach's Alp	ha Reliability Te	st	
CC	Scale	Scale	Corrected	Cronbach's	Mean	Std.
	Mean if	Variance if	Item-Total	Alpha		Deviati
	Item	Item Deleted	Correlation	if Item		on
	Deleted			Deleted		
TS	14143.76	22625162.92	0.93	0.80	357.93	165.01
DRKSI	13864.24	26366367.41	-0.36	0.86	637.46	763.79
SM	14410.53	23616362.56	0.81	0.81	91.16	62.28
RA	14371.88	23845925.96	0.65	0.81	129.82	41.68
TS	14346.85	23478556.30	0.96	0.81	154.85	67.84
LA	14125.35	23463800.56	0.48	0.81	376.34	135.47
SBM	14313.16	23941362.79	0.18	0.81	188.53	93.91
FU	14334.86	23887402.77	0.31	0.81	166.83	72.66
CR	10359.80	10672829.80	0.96	0.79	4141.89	1687.80
IRFR	14320.19	23328875.43	0.93	0.81	181.50	85.93
НР	13014.07	19222047.31	1.00	0.77	1487.62	527.71
РН	13097.06	18337393.72	0.89	0.77	1404.63	696.67
WPM	13940.68	21790862.40	0.92	0.79	561.01	262.57
WHS	11607.55	15275416.85	0.95	0.75	2894.15	1044.99
ENIS	13793.33	22629098.00	0.79	0.80	708.36	191.86
CER	14159.52	22747890.93	0.86	0.80	342.17	163.31
ISO	14449.43	24135235.44	-0.08	0.82	52.26	33.59
ECM	14048.84	22678242.61	0.96	0.80	452.85	153.88
ICM	14329.39	23379105.83	0.88	0.81	172.30	84.74

Table 6.8: Results of Reliability Statistics

CC = Cost Components, TS=Traceability System, DRK=Document & Record Keeping and Self Inspection, SM=Site Mgmt, RA=Risk Mgmt., TS=Technical Service, LA=Lab Analysis, SBM=Soil and Substrate Mgmt., FU=Fertilizer Use, CP Crop Protection, IRFR = Irrigation or Fertigation, HP=Harvesting & Pruning, PH=Produce Handling, WPM=Waste & Pollution Mgmt., Recycling, and Reuse, WHSW=Worker Health, Safety, & Welfare, CERT=Certification, ISO=ISO22000, ECOM=External Communication, and ICOM=Internal Communication

Source: Author's Calculation from Appendix VI by using Cronbach's Alpha Reliability Test

6.2.3 Estimation of Costs and Results

Before analyzing the comparative cost function of the variables related to the compliance costs and industry output variables, let us first assess the factor analysis of cost and analyze relationships between the output of Nepalese highland orthodox tea produced by sampled tea estates and their corresponding costs variables, which can describe the associations and share of cost clusters. This study has identified 60 cost components identified by the focused group discussions among the quality managers/general managers, owners, consultants of the sampled tea estates and the researcher of this study. These components are clustered in 19 different heads as a part of the factor analysis. The costs of these factors are presented in table 6.17, 6.18 and 6.19 (also in Appendix VI)

ISO	22000:2005 REQUIREMENTS	INPUTS
1. Tı	aceability System	
a.	Establishment of a traceability system that allows product to be traced	Stationery/forms
	back to the registered farm or identification product lots & their	Sign posting (label &
	relation to batches raw materials, processing & delivery records	stickers)
b.	Identify every incoming material from the immediate suppers & the	Mapping Computers
	initial distribution route of the end product	(hardware and
с.	Handling unsafe product & in the event of product withdrawal.	software)
		Building
2. D	ocument & Record Keeping & Self-Inspection	
a.	Keep up-to-date records for a minimum of Three years	Develop record-
b.	Keep records that reference each area covered by a crop with all the	keeping sheets
	agronomic activities	Hire personnel to
с.	Records of all fertilizer applications	complete them
d.	Records of irrigation/fertigation water use.	Build offices
e.	Record all crop protection product applications	Consultant services
f.	Complete self-inspection and document it (annually)	FSMS team
g.	Records of maintaining to provide evidence of conformity to	
	requirements & evidence of the operation of FSMS	
h.	Documented procedure (Standard Operating procedure) for Doc. &	
	records.	
3. Si	te Management	
a.	Prepare soil maps for the farming and regular maintenance	Consultant services
4. Ri	sk Assessments (revised annually)	
a.	Food safety, operator health and environment risk assessment	Technical services for
b.	Potential risks for organic fertilizer (disease transmission)	risk assessment –
c.	Risk assessment for irrigation water	outsourcing
d.	Hygiene risk analysis for harvest and pre-farm gate transport process	
e.	Risk assessment of hygiene aspects of the produce handling operation.	
f.	Identify all possible waste products produced	
g.	Risk assessment for working conditions	
h.	Residual analysis	
i.	Quality Control assessment	

Table 6.9: Components of SPS Measures

5. T	echnical Services	
a.	Advice on quantity and type of fertilizer: Use a trained technician to	Hire specialized staff
	determine quantity and type of fertilizer to use	-
b.	Use trained technician for choice of pesticides	
с.	Use systematic methods to calculate water requirement of the crop	
d.	Use technician with recognized certificates or formal training to	
	advise/carry out post-harvest treatments	
e.	Development of procedures for water management, hygienic product	
	handling (physical, chemical and microbiological contaminants)	
f.	Waste and pollution action plan	
6. L	aboratory Analysis	
(Lal	poratory should be accredited to ISO 17025 or equivalent standard)	
à.	Annual pesticide residue testing	Laboratory analysis
b.	Check maximum levels for heavy metals established by the Codex	
	Alimentarius	
с.	Check microbiological contaminants criteria (CAC/GL 21–1997)	
d.	Contents of $N \cdot P \cdot K$ of organic fertilizer	
e.	Analyze irrigation water at least once a year to be done by a suitable	
	laboratory	
f.	Carry out annual analysis of water for post-harvest washing	
g.	Soil analysis	
7. Se	ail and Substrate Management	
л . Б	Use cross line techniques on slones drains sowing grass or green	Consultancy services
u.	fertilizers trees and hushes on borders of sites etc	Seeds and other
	tertifizers, trees and busiles on borders of sites, etc.	materials
8 F	artilizar Usa	materials
0. F	Eastilizer opplication machinery	
a.		G
b.	Carry out verification of calibration by a specialized company, every	Services of a
	year	specialized company
c.	Fertilizer storage	Build storage
	Covered area, free from waste, and does not constitute a breeding place	Maintenance costs
	for rodents, dry,	
	well ventilated and free from rainwater or heavy condensation at least	
	25 meters away from direct water sources,	
9. C	rop Protection	
a.	Implement IPM techniques	IPM training
b.	Modern application equipment	Acquire machinery and
		sprayers
с.	Annual maintenance check of state of application machinery	Services of a
		specialized
		maintenance company
d.	Pesticide storage and handling	
e.	Crop protection products storage (Sound and robust, Secure, Lockable,	Build chemical store
	a source of clean water no more than 10 meters distant and eye	Buy equipment
	washing facility appropriate to the temperature conditions: built of	· · ·
	materials or located so as to protect against temperature extremes, Fire-	
	resistant, well lit, shelving made of non-absorbent material, utensils,	
	e.g. buckets	
f.	Dedicated vehicle for pesticide transport including vehicle purchase	
g.	Chemical mixing area	Build area
 h	Separate storage for empty containers	Build storage
i.	Disposal of empty crop protection product containers in a safe manner	Build chemical
1.	Disposar of empty crop protection product containers in a safe manner	disposal site
;	Application machinery with processra ringing againment for containers	Special machine
J. 1-	Dispose of obsolute area protection products accurate	Support national
К.	Dispose of obsolete crop protection products securely	Support national
		program to dispose of
		obsolete products

10. Irrigation/F	ertigation	
a. Implement waste	a water management plan to optimize water use and reduce	Consultancy services
11. Harvesting	& Pruning	1
a. Hygiene	<u> </u>	
b. Removed p	backed produce from field overnight	Build storage for produce Temporary holding shades Main holding shade withering
c. Packaging/	harvesting containers on farm	
d. Label in au Produce v exporter, j origin	ccordance with CODEX STAN 1–1985, Rev. 2–1999 plus: variety and/or commercial type, Name and address of packer and/or dispatcher. Identification code, Country of	Costs of labeling
12. Produce Ha	ndling	
a. Implement	an hygiene procedure	
b. Pruning an	d maintenance of garden	
c. Where wat disinfected	er is recirculated for final produce washing, it is filtered and , and routinely monitored	Water filtering system
d. On-farm fa	cility for produce handling and/or storage	Packing house
e. Floors des channels, l of food in c	igned to allow and ensure drainage with slopes, drainage ight bulbs protected/shielded so as to prevent contamination case of breakage	Build storage
f. Separate st	orage for waste material	Build storage
13. Waste & Po	llution Management, Recycling and Re-Use	
a. Waste and H	Pollution Action plan	
b. Implement recycling	a plan that covers wastage reduction, pollution and waste	Consultancy services
c. Farms have	designated areas to store litter and waste	Build waste disposal facilities
d. Treat waste	water	Water treatment facilities
14. Worker Hea	alth, Safety and Welfare	
a. Training		
b. Training we personnel h Basic hygie consultant	orkers operating dangerous or complex equipment, Train andling pesticides, Train at least one person in first aid, ene training for food handling by qualified people or	Training courses
c. Facilities, ed	quipment and accident procedures or emergency preparedness	
d. Toilets and production packaging)	d hand-washing equipment for harvest workers and (receiving, rolling, fermentation, draying, sorting, testing &	Build toilets Build hand-washing facilities Build shower facilities Changing room Garments for workers
e. Medical equ	ipment (packing house and cold store)	First aid kits
t. Fire equipm	ent (packing house)	Fire extinguishers
g. Signs warni emergency	ng of potential dangers placed on access door panels with preparedness' procedures	Signs
h. Separate sto	ring for all protective clothing	Build storage
1. Acquire pro protective o	otective clothing (e.g. rubber boots, waterproof clothing, veralls, rubber gloves, face masks etc.)	Buy personal protective equipment
J. Welfare		
k. Health chec	ks on staff working with pesticides	Medical care
I. The living doors, and t	quarters on farm are habitable sound root, windows and hey have potable water, toilets and drains.	Build quarters for workers

15. Environmental Issues				
a. Carry out a base line audit of the fauna and flora on farm	Environmental			
	consultancy services			
b. Develop a wildlife conservation statement.	Environmental			
	consultancy services			
c. Training farmers on environmental impacts of agricultural activities	Training course			
d. Implement wildlife and conservation measures	Costs of corrective			
	actions			
16. Certification	Certification			
	assessment			
a. Certification costs				
17. ISO 2200 Procedures	Hire specialized staff			
PRP, OPRP, HACCP Plan, & other relevant document required b	y and train in ISO			
the ISO 22000:2005	22000:2005 procedures			
a. Adapt ISO 22000 checklist to local/crop conditions				
<i>b.</i> Training course for growers				
18. External Communication				
a. Suppliers & contactors	Resource material			
	(computer, mobile and			
	other accessories			
b. Customer handling, complaint & feedback and establish resource	Resource requirement			
c. Regulatory and Statutory authorities	National standards			
	follow-up			
19. Internal Communication				
a. Impact on food safety management	Technical requirement			
b. Production premises, location of equipment, surroundin	ng Resource requirement			
environment				
c. Packaging, storage & distribution systems.	Resource requirement			

Source: Field Study 2010-11 (Focus Group Discussion) and Various Documents

Based on Table 6.9 clusters and their corresponding costs variables (Appendix VI), which can describe the associations and share of cost clusters with respect to given level of output through the double log linear regression equation 3.1.7. Considering this equation, the following estimated results have been obtained as inferences.

Dependent Variable: InOUTPUT							
Independent Variable	Coefficient	Std. Error	Std. Error t-Statistic				
С	-13.49	1.00	-13.46	0.01			
lnCQ _c	3.46	0.34	10.14	0.01			
lnSPSQc	1.58	0.44	-3.59	0.01			
R-squared	0.98	Adjusted R-squared		0.98			
No. of Observations		18	Prob (F-statistic)	0			

Table 6.10	: Regression	Results of	Output and	Quality	Cost
	0		1	<u> </u>	

Source: Author's Calculation from Appendix VII

The results presented in the table 6.10 reveals that the relationship between the dependent variable i.e. natural log of output of Nepalese highland orthodox tea (InOUTPOT) and natural log of costs components, which are taken here as

independent variables. The elasticity of the natural log of conventional quality costs $(\ln CQ_c)$ and the natural log of SPS quality cost $(\ln SPSQ_c)$ reveals a positive relationship as the elasticity figures 3.46 and 1.58 respectively with their respective t-statistics significant at 1 percent critical value. The constant having -13.48 also seems significant at 1 percent critical value in its t-statistics. To analyze the comparative cost function with respect to the output in this segments, the OLS regression is applied to estimate the individual cluster of cost components of the ISO 22000 rule (e.g. compliance with ISO 22000 plans and implementation) using equation 3.1.8.

The regression result of equation 3.1.8 is presented in table 6.11 shows the relationship between the dependent variable - natural log of conventional quality cost $(\ln CQ_c)$, and natural log of output (lnOUTPUT) as independent variable. This regression also shows a positive relationship between the variables as the elasticity of the natural log of lnOUTPUT is found to have 0.43 with its respective t-statistics significant at 1 percent critical value. The constant having 7.13 also seems significant at 1 percent critical value in its t-statistics.

Dependent Variable: lnCQ _c							
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	7.13	0.11	65.73	0.01			
InOUTPUT	0.43	0.02	22.93	0.01			
R-squared	0.97	Adjusted R-squared		0.97			
No. of Observations 18 Prob (F-statistic)			Prob (F-statistic)	0.01			

Table 6.11: Regression Results of Conventional Quality Cost and Output

Source: Author's Calculation from Appendix VII

For the conventional set up or fixed quality cost analysis with respect to output can be shown from the equation 3.1.9. The results of the regression 3.1.9 is presented in table 6.12 presents the relationship between the natural log of conventional set-up cost ($\ln SQ_c$) as dependent variable and natural log of output ($\ln OUTPUT$) as independent variable. The regression result express here also a positive relationship between the variables as the elasticity of the natural log of $\ln OUTPUT$ is found to have 0.30 with its respective t-statistics significant at 1 percent critical value. The constant having 7.59 also seems significant at 1 percent critical value in its t-statistics.

Dependent Variable: lnSC _c						
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	7.59	0.07	103.47	0.01		
InOUTPUT	0.30	0.01	23.45	0.01		
R-squared	0.97	Adjusted R-squared		0.97		
No. of Observations		18	Prob (F-statistic)	0		

Table 6.12: Regression Results of Conventional Set-Up Cost and Output

Source: Author's Calculation from Appendix VII

Likewise, the relationship between conventional ongoing or variable cost with respect to output can be explained from equation 3.1.10. The results derived by the regression 3.1.10 is presented in table 6.13 reveals the relationship between the natural log of conventional quality ongoing or variable cost ($lnOC_c$) as dependent variable and natural log of output (lnOUTPUT) as independent variable. The regression results indicate a positive relationship between the variables as the elasticity of the natural log of lnOUTPUT is found to have 0.74 with its respective t-statistics significant at 1 percent critical value. The constant having 3.93 also seems significant at 1 percent critical value in its t-statistics.

 Table 6.13: Regression Results of Conventional Ongoing Cost and Output

Dependent Variable: InOC _c						
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	3.93	0.28	14.03	0.01		
InOUTPUT	0.74	0.05	15.41	0.01		
R-squared	0.94	Adjusted R-squared		0.93		
No. of Observations18Prob (F-statistic)				0.01		

Source: Author's Calculation from Appendix VII

As this study focus mainly on the analysis of SPS compliance costs for Nepalese orthodox tea faced by producers and exporters of these products. These costs of compliance are understood as additional costs incurred by exporters in meeting the requirements laid upon them in complying with a given regulation in the importing country. Therefore, for SPS compliance cost analysis with respect to output is presented here referring to the equation 3.1.11.

The regression results of equation 3.1.11 presented in table 6.14 shows the relationship between the natural log of SPS quality cost ($lnSPSCQ_c$) as dependent variable and natural log of output (lnOUTPUT) as independent variable. The regression result imparts a significant relationship between the variables as the elasticity of the natural log of lnOUTPUT is found to have 0.32 with its respective t-statistics significant at 1 percent critical value. The constant having 7.03 also seems significant at 1 percent critical value in its t-statistics.

Dependent Variable: InSPSQ _c							
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	7.03	0.17	40.65	0.01			
InOUTPUT	0.32	0.03	10.60	0.01			
R-squared	0.88	Adjusted R-squared		0.87			
No. of Observations		18	Prob (F-statistic)	0.01			

 Table 6.14: Regression Results of SPS Quality Cost and Output

Source: Author's Calculation from Appendix VII

Similarly, the regression of SPS compliance fixed or set-up cost analysis with respect to output is presented referring to the equation 3.1.12. The regression results of the equation 3.1.12 presented in Table 6.15 describes the relationship between the natural log of SPS quality fixed cost (lnSPSQS_c) as dependent variable and natural log of output (lnOUTPUT) as independent variable. The simulation results suggests that there is a significant relationship between the variables as the elasticity of the natural log of lnOUTPUT is found to have 0.19 with its respective t-statistics significant at 1 percent critical value. The constant having 7.45 also seems significant at 1 percent critical value in its t-statistics.

Dependent Variable: InSPSQS _c								
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.				
С	7.45	0.09	78.56	0.01				
InOUTPUT	0.19	0.02	11.94	0.01				
R-squared	0.90	Adjusted R-squared		0.89				
No. of Observations		18	Prob (F-statistic)	0.01				

Table 6.15: Regression Results of SPS Set-Up Cost and Output

Source: Author's Calculation from Appendix VII

Finally, SPS compliance ongoing or variable cost analysis with respect to output is presented in the equation 3.1.13. The above regression results of the equation 3.1.13 presented in table 6.16 indicates the relationship between the natural log of SPS quality ongoing cost (lnSPSQO_c) as dependent variable and natural log of output (lnOUTPUT) as independent variable. The results of the regression also suggests a significant relationships between the variables as the elasticity of the natural log of lnOUTPUT is found to have 0.64 with its respective t-statistics significant at 1 percent critical value. The constant having 3.67 also seems significant at 1 percent critical value in its t-statistics.

Dependent Variable: InSPSQO _c								
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.				
С	3.67	0.39	9.31	0.01				
InOUTPUT	0.64	0.07	9.40	0.01				
R-squared	0.85	Adjusted R-squared		0.84				
No. of Observations		18	Prob (F-statistic)	0.01				

 Table 6.16: Regression Results of SPS Ongoing Cost and Output

Source: Author's Calculation from Appendix VII

6.2.4 Comparative Cost Analysis of the Sampled Tea Estates

While comparing the average cost structure of the sampled tea estates, this study has obtained chronological cost increments with respect to their size. The table 6.17 reveals that the small size tea estates have on average Rs. 7869.30 thousand conventional set-up/fixed and Rs. 2038.40 thousand ongoing quality related costs, whereas, the medium size tea estates have on average Rs. 10275.06 thousand conventional set-up/fixed and Rs. 2961.49 thousand ongoing quality related costs. Similarly, the large size tea estates have on average Rs. 15205.93 thousand conventional set-up/fixed and Rs. 9567.80 thousand ongoing quality related costs. The study has found on average Rs. 11103.50 thousand conventional fixed and Rs. 4327.00 ongoing quality related costs.

 Table 6.17: Average Conventional Quality Compliance Cost of Sampled Tea

 Estates

								Cost in '	Thousands
Firm	Sm	all	Medi	um	Lar	ge		Total	
CC	S	0	S	0	S	0	S	0	Grand
TS	346.80	49.00	407.33	59.57	602.64	192.54	444.00	87.94	531.95
DRKSI	193.80	490.00	232.76	714.83	344.36	2310.47	253.23	1044.43	1297.67
SM	96.90	0.00	116.38	0.00	172.18	0.00	126.62	0.00	126.62
RA	102.00	49.00	116.38	59.57	172.18	192.54	127.18	87.94	215.13
TS	132.60	24.50	174.57	29.78	258.27	96.27	188.51	43.97	232.48
LA	255.00	156.80	325.86	190.62	482.11	616.12	352.71	281.42	634.13
SBM	102.00	88.20	145.47	119.14	215.23	385.08	156.14	174.80	330.94
FU	102.00	63.70	135.84	96.48	201.34	311.44	146.64	140.60	287.24
CR	3320.10	514.50	4564.66	958.80	6757.05	3095.12	4913.57	1384.17	6297.75
IRFR	153.00	24.50	209.48	29.78	309.93	96.27	225.53	43.97	269.50
HP	1173.00	343.00	1571.12	416.98	2324.46	1347.77	1694.29	615.61	2309.90
PH	1331.10	161.70	1635.13	196.58	2419.16	635.38	1775.58	290.21	2065.79
WPM	561.00	73.50	640.09	89.35	947.00	288.81	699.50	131.92	831.42
Total	7869.30	2038.40	10275.06	2961.49	15205.93	9567.80	11103.50	4327.00	15430.50

CC = Cost Components, S = Set-Up Cost, O = Ongoing Cost,

Note: The Scale of firms is categorized into three groups viz. Small Scale, Medium Scale, and Large Scale on the basis of their exportable products and volumes. Those firms which exports up to 100000 kg per year has been kept under small scale, 100001 to 400000 kg under medium scale, and above than 400000 kg under large scale.

Source: Authors calculation from Appendix VI

Likewise, while dealing with the SPS quality cost structure of the sampled tea states, the table 6.18 indicates that the small size tea estates have on average Rs. 4680.27 thousand SPS set-up/fixed and Rs. 1121.37 thousand ongoing SPS quality related costs, whereas the medium size tea estates have on average Rs. 4983.61 thousand SPS set-up/fixed and Rs. 1234.24 thousand ongoing SPS quality related costs.

 Table 6.18: Average SPS Quality Compliance Cost of Sampled Tea Estates

Cost in Thousands

Firm	Sn	nall	Med	lium	Large		Total		
CC	S	0	S	0	S	0	S	0	Grand
WHS	2926.64	625.49	3181.27	705.28	4369.80	2172.89	3417.10	1022.55	4439.64
ENIS	633.42	287.39	675.16	299.74	927.40	923.48	726.58	436.98	1163.56
CER	410.55	45.08	400.52	47.02	550.15	144.86	434.89	68.55	503.43
ISO	35.19	39.45	34.33	41.14	47.16	126.75	37.28	59.98	97.25
ECM	498.53	112.70	486.35	117.55	668.05	362.15	528.08	171.36	699.44
ICM	175.95	11.27	205.98	23.51	282.94	72.43	219.75	33.02	252.77
Total	4680.27	1121.37	4983.61	1234.24	6845.50	3802.56	5363.66	1792.43	7156.09

Source: Authors calculation from Appendix VI

Similarly, the large size tea estates have on average Rs. 6845.50 thousand SPS set-up/fixed and Rs. 3802.56 thousand ongoing SPS quality related costs. The study has found on average Rs. 5363.66 thousand SPS fixed and Rs. 1792.43 ongoing SPS quality related costs.

Figure 6.1: Average SPS Quality Compliance Cost of Sampled Tea Estates



Figure 7.1.1 represents the average SPS quality compliance cost of sampled tea estates presented in the table 6.18.

The table 6.19 has presented a composite analysis of the percentage share of conventional and SPS quality costs of sampled tea estates. From the table, the small size tea estates have on average 63.07 percentage of conventional quality cost (50.09 percent set-up/fixed and 12.98 percent ongoing quality related costs) and 36.93 percent SPS quality cost (29.79 percent set-up/fixed and 7.14 percent ongoing quality related costs). The table shows overall 79.88 percentage set-up/fixed costs and 20.12 percentage of conventional quality cost (52.78 percent set-up/fixed and 15.22 percent ongoing quality related costs) and 32.00 percent SPS quality cost (25.65 percent set-up/fixed and 6.35 percent ongoing quality related costs). The table shows overall 79.89 percentage costs.

Table 6.19: Percentage of Quality Compliance Cost of Sampled Tea Estates

Cost Rs. In Th	housand
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Eirm	Conventio	onal Qual	ity Cost	SPS	Quality	Cost	G	rand Tot	al
FI []]]	SCC	OCC	Total	SCQ	QO _C	Total	SC	OC	Total
ORT01S	49.69	13.40	63.08	29.55	7.37	36.92	79.24	20.76	100
ORT02S	50.49	12.57	63.06	30.03	6.91	36.94	80.52	19.48	100
Small Average	50.09	12.98	63.07	29.79	7.14	36.93	79.88	20.12	100
ORT03M	52.51	15.19	67.69	25.90	6.41	32.31	78.40	21.60	100
ORT04M	52.18	15.52	67.71	25.73	6.57	32.29	77.91	22.09	100
ORT05M	52.33	15.35	67.68	25.82	6.50	32.32	78.15	21.85	100
ORT06M	52.43	15.29	67.71	25.84	6.45	32.29	78.27	21.73	100
ORT07M	52.96	14.71	67.67	26.14	6.19	32.33	79.10	20.90	100
ORT08M	52.60	15.09	67.69	25.94	6.37	32.31	78.54	21.46	100
ORT09M	52.53	15.14	67.67	25.93	6.40	32.33	78.46	21.54	100
ORT10M	52.50	15.17	67.66	25.91	6.42	32.34	78.41	21.59	100
ORT11M	52.58	15.11	67.69	25.94	6.37	32.31	78.52	21.48	100
ORT12M	52.60	15.09	67.69	25.94	6.37	32.31	78.54	21.46	100
ORT13M	53.84	15.57	69.41	24.56	6.03	30.59	78.40	21.60	100
ORT14M	54.30	15.37	69.67	24.18	6.15	30.33	78.48	21.52	100
Medium Scale Average	52.78	15.22	68.00	25.65	6.35	32.00	78.43	21.57	100
ORT15I	42.79	27.17	69.96	19.52	10.52	30.04	62.31	37.69	100
ORT16I	43.19	26.85	70.04	19.23	10.73	29.96	62.42	37.58	100
ORT17I	43.31	26.75	70.06	19.12	10.82	29.94	62.43	37.57	100
ORT18I	42.42	27.27	69.69	19.43	10.88	30.31	61.85	38.15	100
Lage Scale Average	42.92	27.01	69.94	19.33	10.74	30.06	62.25	37.75	100
Average Total	50.29	17.59	67.88	24.71	7.41	32.12	75.00	25.00	100

ORT = Orthodox Tea Estate, S = Small Scale, M = Medium Scale, and L = Large Scale

Source: Authors calculation from Appendix VII

Similarly, the large size tea estates have 69.94 percentage of conventional quality cost (42.92 percent set-up/fixed and 27.01 percent ongoing quality related

costs) and 03.06 percent SPS quality cost (19.33 percent set-up/fixed and 10.74 percent ongoing quality related costs). The table shows overall 62.25 percentage setup costs and 37.75 percentage ongoing/variable costs.





Figure 7.1.2 represents the percentage of quality compliance cost of sampled tea estates presented in the table 6.19.

6.2.5 Rank Correlation of Perceptual Indicators

In addition to some simple regression estimations and other statistical analysis, this study has attempted to assess some perceptual analysis based on the reactions and information drawn from the respondent of sampled tea estates regarding the benefit from the implementation of SPS quality compliances, difficult aspects of SPS quality compliances, and constraining factors for the export growth of Nepalese Tea products. For this, Spearman Rho correlation, which is a nonparametric (distribution-free) rank statistic proposed by Spearman in 1904 as a measure of the strength of the associations between various variables, has been used. The Spearman rank correlation coefficient is used to give an R-estimate, and is a measure of monotone association that is used when the distribution of the data make Pearson's correlation coefficient undesirable or misleading. In this segment has analyzed the important food safety-related and as well as the policy issues that are constraining the Nepalese tea industry from attaining a higher level of export growth.

6.2.5.1 Benefits from SPS Quality Compliance

Regarding the perceived benefits that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000:2005 certification, the analysis shows that there is significant correlation between perceived benefit and the costs involved in implementing ISO 22000 having a significant coefficient i.e. 0.800 in the Spearman's rank correlation.

Benefit Components	APBS	APBM	APBL	WAPB
Increased ability to retain existing customers	2.50	2.25	2.75	2.50
Reduced product microbial counts	3.00	2.08	1.75	2.28
Increased product sales	2.50	2.17	2.25	2.31
Increased ability to access new export	1.50	1.17	1.25	1.31
markets				
Increased ability to attract new customers	2.00	1.75	2.00	1.92
Reduced product wastage	2.50	2.67	2.25	2.47
Increased product shelf-life	2.50	2.33	1.75	2.19
Increased motivation of production staff	3.50	2.92	2.75	3.06
Increased motivation of supervisory staff	3.00	3.50	3.25	3.25
Increased product prices	2.00	2.17	2.25	2.14
Reduced production costs	4.50	4.50	4.75	4.58
АРВ	2.95	2.75	2.70	2.80
Cost Average	15709.3	19454.4	35421.7	23528.5
	4	0	9	1

 Table 6.20: Average Perceived Benefit Rank of Sampled Tea Estate

Source: Author's Calculation from Appendix VIII

Note: APB is average perceived benefit that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000; S is small scale firm; M is medium Scale firm; and L is Large Scale Firm

Spearman Rho Correlations Result							
			APB	Cost			
Spearman's Rho	APB	Correlation Coefficient	1.00	0.80*			
		Sig. (1-tailed)		0.10			

Coefficients represent t values significant at *1 and **5

The perceived rank and correlation coefficient has been presented in the following table 6.20. All the coefficients presented in the table are found to be significant at 1 percent critical Value.

6.2.5.2 Difficulties of Implementing SPS Quality Compliance

Analyzing the perceived difficult aspects that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000:2005 certification, the analysis shows that there is significant correlation between perceived difficulties and the size of firm (in terms of output) that is involved in implementing ISO 22000 having the Spearman Rho Coefficient 0.99.

Difficulty Component	APDISOS	APDISO	APDISOL
		Μ	
Internal budgetary constraint	1	2.33	2.25
Difficulties in obtaining external funding	1.5	1.33	1.5
Reduced staff time available for other tasks	1.5	2.58	2.75
Training/motivation of production/supervisory staff	1	2.33	2.75
Difficulties of getting advise	4	3.42	2.5
Reliable raw material supplier	1.5	1.42	1.5
Recouping costs of implementing ISO 22000:2005 or other quality standard system	1	1.17	1.5
Reduced flexibility to introduce new products	3	3.33	3.5
Reduced flexibility of production process	2.5	3.33	3.5
Reduced flexibility of production staff	2	3.00	3.5
Uncertainty about potential benefits from ISO 22000:2005 or other quality standard system	4.5	5.00	5
Average APDISO	2.14	2.66	2.75
Average Output	105	267.50	1000

 Table 6.21: Perceived SPS Difficulties Rank of Sampled Tea Estate

Source: Author's Calculation from Appendix IX

Note: APDISO is average perceived difficult aspects that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000.

Spearman Rho Correlations Result								
			APDISO	Output				
Spearman's Rho	APDISO	Correlation Coefficient	1.00	0.99*				
		Sig. (1-tailed)		0.04				

Coefficients represent t values significant at *1 and **5

The perceived rank and correlation coefficient has been presented in the above table 6.21. The coefficient is found to be significant at 1 percent critical Value.

6.2.5.3 Constraining Factors of Implementing SPS Quality Compliance

Regarding the perceived difficulties of important factors that are constraining the Nepalese Tea industry from attaining a higher level of export growth perceived difficult aspects that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000:2005 certification, the analysis reveal that there is significant correlation between perceived difficulties and the size of firm (in terms of output) that is involved in implementing ISO 22000 having the Spearman Rho Coefficient 0.99.

Constraint Component	APCFTS	APCFTM	APCFTL
Cost and quality of tea inputs	1.00	1.17	1.75
Cost of processing	1.00	1.33	1.75
Transport	1.00	1.33	2.00
Credit/Capital	1.50	1.42	1.75
Cost of doing business	1.50	1.25	2.00
Overall product quality	2.50	3.17	3.50
Consistency of product quality	1.50	1.17	1.50
Compliance with food safety requirements	1.00	1.25	1.00
Compliance with environmental requirements	3.00	2.42	3.00
Value added	1.50	1.58	1.75
Difficulties to entry and exit	1.50	1.58	2.50
Bureaucracy	1.00	1.33	1.00
Government regulations	1.00	1.58	2.00
Lack of government support	1.00	1.08	1.25
Average APCFT	1.43	1.55	1.91
Average Output	105.00	267.50	1000.00

 Table 6.22: Perceived Constraining Factors Rank of Sampled Tea Estate

Source: Author's Calculation from Appendix X

Note: APCFT is average perceived constraint that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000 from attaining a higher level of export growth.

Spearman Rho Correlation Result							
			APCFT	Output			
Spearman's Rho	APCFT	Correlation Coefficient	1.0	0.99*			
		Sig. (1-tailed)		0.03			

Coefficients represent t values significant at *1 and **5

The perceived rank and correlation coefficient has been presented in the above table 6.22. The coefficient is found to be significant at 1 percent critical Value.

6.2.5.4 Constraining Factors of Food Safety and SPS Quality Compliance

Regarding the perceived difficulties of important food safety-related issues that are constraining the Nepalese Tea industry from attaining a higher level of export that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000:2005 certification, the analysis has shown that there is significant correlation between perceived difficulties and the size of firm (in terms of output) that is involved in implementing ISO 22000 having the Spearman Rho Coefficient 0.99. The coefficient is found to be significant at 1 percent critical Value. The perceived rank and correlation coefficient has been presented in the following table 6.23.

Table 6.23: Perceived Food Safety-Related Quality Issues Constraining theNepalese Tea Industry from Attaining Higher Level of Export

Constraint Components	APQCTS	APQCTM	APQCTL
Food industry's trust in the food safety regulatory body	2.5	1.83	1.75
Government's food safety regulatory systems	1.5	1.67	2
Cost of compliance	1	1.33	1.25
Traceability system	2	2.50	3.5
Monitoring and surveillance systems	2	2.75	2.25
Industry's current adoption of food safety systems	1.5	1.67	1.75
Culture of food safety among firms in the industry	1.5	1.25	2
Culture of product quality among firms in the industry	2.5	1.75	2
APQCT	1.81	1.84	2.06
Output	105	267.50	1000

Source: Author's Calculation from Appendix XI

Note: APQCT is average perceived food safety-related quality issues that are constraining the Nepalese Tea industry from attaining a higher level of export

Spearman Rho Correlations Result					
	WAPQCT Output				
Spearman's Rho	WAPQCT	Correlation Coefficient	1.0	0.99*	
Sig. (1-tailed)					

Coefficients represent t values significant at *1 and **5

6.2.5.5 Difficulties of Implementing SPS Quality Compliance

Regarding the perceived constraining policy related factors of important food safetyrelated issues that are constraining the Nepalese Tea industry from attaining a higher level of export that have been experiencing by the sampled tea estates through the implemented quality standard ISO 22000:2005 certification, the analysis has found that there is correlation between perceived difficulties and the size of firm (in terms of output) that is involved in implementing ISO 22000 having the Spearman Rho Coefficient 0.50. The coefficient is found to be significant at 1 percent critical Value. The perceived rank and correlation coefficient has been presented in the following tables.

Policy Constraint	APPCTS	APPCTM	APPCTL
Administrative regulations; bureaucracy in	1.5	2	2
the public sector			
Trade policy	1	1.5	1.5
Export promotion policy	1	1.33	1
Macroeconomic policy	4.5	2.67	2.75
Food safety policy and regulation	1	1.58	2
Tax system's impact on investment and risk-	2.5	2.42	2.5
taking			
Investment in infrastructure	1	1.08	1.75
Labor policy	2.5	1.25	1
APPCT	1.88	1.73	1.81
Average Output	105.00	267.50	1000.00

Table 6.24: Perceived Policy Related Constraint Rank of Sampled Tea Estate

Source: Author's Calculation from Appendix XII

Note: APPCT is average perceived Policy Related Constraint for food safety-related quality issues that are constraining the Nepalese Tea industry from attaining a higher level of export

Spearman Rho Correlations Result					
WAPPCT Output					
Spearman's Rho	WAPPCT	Correlation Coefficient	1.0	-0.50*	
Sig. (1-tailed) 0.33					

Coefficients represent t values significant at *1 and **5

6.2.6 Status and Operation Performance of Orthodox Tea Industry

Nepalese orthodox tea industry has potential growth industry with comparative advantage of soil, weather conditions, and the availability of labors. But it has a meager share in terms of production. However, there are relatively large and medium size of gardens and plants, the presence of small farmers in growing leaves is noticeable. There is an estimated 6871 orthodox tea producers, among them, only 18 estates have been producing tea for export. These 18 tea estates are all private joint stock companies including NTDC, which is privatized government owned estates and

are also the members of Himalayan Orthodox Tea producers' Association, are taken as sample for this study. Among these sample tea estate, 2 are small scale, 12 are medium scale and 4 are large scale firms.

S.N.	Size of Firm/Estate	Number as Sample	Percentage
1	Small	2	11.11
2	Medium	12	66.67
3	Large	4	22.22
Total	-	18	100

Table 6.25:	Sample T	'ea Estates
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Source: Field Survey 2010-11

Note: The Scale of firms is categorized into three groups viz. Small Scale, Medium Scale, and Large Scale on the basis of their exportable products and volumes. Those firms which exports up to 100000 kg per year has been kept under small scale, 100001 to 400000 kg under medium scale, and above than 400000 kg under large scale.

The above table can be presented in the following chart figure.



Figure 6.3: Sample Tea Estates

Despite Nepal's potential in highland orthodox tea in terms of export, the emergence of this industry is found to have started late as most of the sampled estates are reported to be established after 1990 and more specifically after 1995 except NTDC was established in 1966. Because of the young stage of the production in the industry, most of the sampled estate have reported that the production have been increasing for the last 10 years and anticipated to increase in the next five years.

As against the backdrop of the stringent SPS standards mandatory for the export markets of the developed countries a growing concern is found among Nepalese orthodox tea producers and exporters to implement quality compliance measure. But all the producers and exporters have reported that these compliances or the motivation are due to mandatory quality regulation set by the export markets. Among sampled estates majority of them have adopted SPS measures after 2005 while there are quite few who adopted it in yearly nineties.

S.N.	Period of SPS Implementation	Number of Firms	Percentage
1	1990-95	3	16.67
2	1996-2000	3	16.67
3	2001-2005	4	22.22
4	2006-2010	8	44.44
Total	l	18	100.00

 Table 6.26: SPS Implementation by Sample Tea Estates

Source: Field Survey 2010-11

The above explanation presented in the table 6.26 can also be presented in the following figure.



Figure 6.4: SPS Implementation by Sample Tea Estates

Regarding the selection and adoption of quality standard the survey has found that all sample estates have adopted very limited standard i.e. HACCP and ISO 22000, as they best suit for the production and export of highland tea products. Some estates which have been supplying relatively large volume and adopted these measures in the early period are found to have adopted multiple standards.

S.N.	Adoption of SPS Measure	Number of Firms	Percentage
1	ISO 22000	11	61.11
2	НАССР	3	16.67
3	ISO 22000 and HACCP	4	22.22
Total		18	100.00

 Table 6.27: SPS Implementation by Sample Tea Estates

Source: Field Survey 2010-11

The above analysis presented in the table 6.27 can also be presented in the following figure.



Figure 6.5: SPS Implementation by Sample Tea Estates

Like many literatures, which reveal that the SPS cost of compliance is significant and that is also demonstrated in this study, this survey at the same time reveal that the adoption of SPS measures impart benefit to the producers and exporters. All producers and exporters under survey revealed that they experience and are able to negotiate for the increase in the prices because of the implementation of SPS quality system.

S.N.	Increase in Prices (in %)	Number of Firms	Percentage
1	1-10	1	5.56
2	11-20	4	22.22
3	21-30	9	50.00
4	31-40	3	16.67
5	41-50	1	5.56
Total		18	100.00

Table 6.28: Increase in Prices of Orthodox Tea Due to SPS Compliance Receivedby Sample Tea Estates

Source: Field Survey 2010-11

The above analysis presented in the table 6.28 can also be presented in the following figure.





In addition to the realization of increased prices, all samples estates have reported that they are able to marginally increase the volume of production due to the implementation of SPS measures. But it is noteworthy to mention here that the large scale estates are found to have increased the volume of production more than the medium and small scale estates.

Table 6.29: Increase in Volume of Production of Orthodox Tea Due to SPSCompliance Received by Sample Tea Estates

S.N.	Increase in Volume (in %)	Size of Estates	Percentage
1	1-5	2	11.11
2	6-10	12	66.67
3	11-15	4	22.22
Total		18	100.00

Source: Field Survey 2010-11

The above analysis presented in the table 6.29 can also be presented in the following figure.





Likewise, all samples estates have reported that they are able to increase the sales of their produces in the international markets due to the implementation of SPS measures. It is revealed from the survey that the large scale estates are found to be capable of selling proportionately larger volume of production more than the medium and small scale estates.

 Table 6.30: Increase in Sales of Orthodox Tea Due to SPS Compliance Received

 by Sample Tea Estates

S.N.	Increase in Sales (in %)	Size of Estates	Percentage
1	1-15	3	16.67
2	16-30	10	55.55
3	31-45	5	27.78
Total		18	100.00

Source: Field Survey 2010-11

The above analysis presented in the table 6.30 can also be presented in the following figure.

Figure 6.8: Increase in Sales of Orthodox Tea Due to SPS Compliance Received by Sample Tea Estates



Regarding the additional cost other than presented in table 6.17, 6.18, and 6.19, all respondents reveal that they have to hire additional manpower as a result of the implementation of SPS measures especially for record keeping and traceability. Regarding the cost of salary due to this compliance, all respondent reported that they provide training to comply with the SPS framework instead of increasing the salary. But annual increment of salary on the regular basis has not been included in this study. Likewise, the respondents report that they had to bear the cost of re-organize the business and the production process, especially on the physical infrastructure such

as; Floor modern (tiled), Roof wooden, paint, iron replaced with SS, Nets used in window, Changing, Washing room, Quarter and facility, meeting hall, Factory garden, Equipment : moisture meter and other related equipments. The survey also found that the producers or the exporters had to change input and raw material suppliers due to SPS compliance as per the practices to receive the quality state by the factory and staffs. They also need to train the farmers to use food grade quality oil and greases etc.

6.2.7 Non-Compliance Cost to WTO

The non-compliance cost is another important issue in dealing with the impacts of WTO on the economies of developing and low income countries. MTAs and PTAs generally limit the policy flexibility of the governments. Despite the claim of getting access to intellectual property and technology under the WTO regime, the knowledge is experienced to have unilaterally flown. Likewise, a high level professional manpower experiencing international trade, which is rare in these countries, is needed to manage dispute settlement. There is less involvement of the developing countries and low income countries in trade policy review mechanism in the WTO arrangements. The country should, sometimes, be liable for compensation if dispute settlement body disfavors the case. Likewise, lack of financial, human resources and institutional capabilities, poor infrastructure, highly restricted market of the developed countries have remained as major non-compliance costs for developing and least developed countries. The agricultural sector of these countries has to compete in the highly competitive market of sophisticated technology-capital oriented regime with weak human capital, poor infrastructure, obsolete technology, land with fragmented ownership by small producers and landless workers, weak community organization and participation, feeble functioning of product and factor markets, and macroeconomic instability.

Likewise, policy operational and legal compliance costs, management of domestic subsidy in the agricultural sector, reduction of export subsidy, development of new laws and amendment of existing laws including the Trade-Related Aspects of Intellectual Property Rights (TRIPs) measures, meeting the transparency mechanism, development of quality control mechanism, making tariff only arrangements, development of a favorable trade administration mechanism etc. contain significant costs, that have a substantial impact on government expenditure, revenue generation, poverty alleviation, employment generation, food security, industrialization etc..

Another important aspect of the non-compliance in WTO framework is the cost of the lack of compliance. The lack of compliance involves both short-run and medium to long-run opportunity costs. The short-run cost includes the immediate loss in export earning, national income, income of farmers, trades and households as well as employment. Further, the lack of compliance will have negative impact on education, health and well being of the peasant not only because they lose their main source of income, but also because of the negative impact on Government revenues thus its provision of social services. To such long-run effects one may also add those related to difficulties in regaining credibility and reliability even when the sources of the problem are tackled.

The situation can be exemplified with the case of Rift Valley fever affecting livestock in the Somali Region of Ethiopia and the resultant ban by Saudi Arabia on imports of livestock from Ethiopia. In 1998, the Government of Saudi Arabia imposed a ban on imports of livestock from Ethiopia which was removed after 16 months. But after an outbreak of the disease within Saudi Arabia and some neighboring countries, a new ban on imports from Ethiopia, and other countries in Horn of Africa, was imposed by Saudi Arabia, Yemen and UAE. The Saudi's ban on imports of live animals from Ethiopia was still in effect as of mid 2006 although the ban on meat has been lifted and there was no evidence of disease in livestock of Ethiopia anymore (Shafaeddin, 2007).

According to a simulation exercise, it is estimated that exports from the Somalia Region of Ethiopia declined by 42 per cent during the first 16 months when the ban was in force (Pratt, et.al: 17). Further, the GDP of the Region declined by US\$ 91m (25 per cent) and the producers experienced the loss of value added of about 50 per cent due to the fall in prices of livestock (Ibid:17 and 3and 20). In addition to producers, the traders, brokers, transport and retailers experienced declines in their income (Ibid: 23). The only gainers were butchers who benefited from the decline in the price of the livestock in the domestic market. Household income of pastoral and sedentary farmers (503912 families) was also adversely affected by between 19 to 25 per cent. The pastorals in general were more severely affected, and the middle income

households in both groups were the main losers (Ibid: 21 and 52). The consumption by producing households was also affected negatively by about 7.5 per cent in nominal terms as a result of the decline in their income.

The longer-term effects of the lack of compliance is that the Saudi Government has not removed the ban on imports of live animals from Ethiopia, despite the fact that the disease had disappeared, presumably because of the lack of confidence in the product exported from Ethiopia. Even if the ban was not justified on scientific grounds any more, it had been instigated because of the initial lack of conformity of the export products to the standard of the importing country, but persisted even when the problem was tackled.

There are a number of other cases of the lack of conformity of a product by an exporting country which has cost the country a lot. For example, the experience of China after its accession to WTO indicates that SPS barriers to trade in EU, Japan and the USA affected about 90 per cent of exporters of foodstuffs and animal by-products and led to losses of \$9 billion in 2002 (Dong and Jensen,2004). The experience of China also reveals that the failure to comply with SPS measures will lead to more frequent and closer inspections of future export products of a country by the importers (Ibid: 2-4). The Scandal on dog and cat feeds, toothpastes etc. imported to the USA from China led to a trade tension between the two countries in 2007 and the Chinese admitted that their national credibility, reputation and image was damaged as far as food safety was concerned.

The experience of many developing exporting countries also shows that often their intervention in the SPS measures has taken place ex-post i.e. after they are alerted that their product faced a problem in the port of the importing country as a result of inspection by the relevant authorities (World Bank, 2005). The lack of control by the exporting country at the port of exporting and more importantly at the farm level, or other segments of the supply chain, was the root cause of the problem. The result has been trade disruption and in some cases the return of the product to the exporting country involving the transport cost and the costs of disposal of the product. (Ibid).

6.3 Major Findings

This segment of the study has presented the major findings about the implication of SPS compliance on export in WTO framework. The export cost implication is examined here in terms of Nepalese exportable tea i.e., highland orthodox tea. In the analysis, the stringent SPS standards set by developed countries, coupled with the lack of technical and economic resources of developing countries to participate in standard setting process, has resulted in a substantial increment in cost for Nepalese exportable orthodox tea according to the SPS framework. When boiling down the data analysis this study has found the following results:

- i. A significant direct and positive relationship is found between the conventional quality cost and output, which is compatible with the neo-classical cost function between cost and output.
- ii. Likewise, a significant direct and positive relationship is found between the conventional set-up/fixed cost and output.
- The relationship between conventional quality ongoing or variable cost with respect to output has also significant direct and positive relationship.
- A significant direct and positive relationship is also found between the SPS quality cost and output.
- v. Likewise, a significant direct and positive relationship is found between the SPS quality set-up/fixed cost and output.
- vi. The relationship between SPS quality ongoing cost with respect to output has also significant direct and positive relationship.
- vii. Regarding the average cost structure of the sampled tea estates, this study has obtained chronological cost increments with respect to their size.
- viii. Regarding the SPS quality cost structure of the sampled tea states, the average increment in set up costs for small to medium and large firms is found with small proportion while in the ongoing costs seems somewhat proportionate.

- ix. The analysis shows that there is significant correlation between perceived benefit and the cost that is involved in implementing ISO 22000.
- x. Analyzing the perceived difficult aspects that have been experiencing by the sampled tea estates, the analysis shows that there is significant correlation between perceived difficulties and the size of firm (in terms of output).
- xi. Regarding the perceived difficulties of important factors that are constraining the Nepalese Tea industry from attaining a higher level of export growth perceived difficult aspects, the study reveals that there is significant correlation between perceived difficulties and the size of firm (in terms of output).
- xii. In the perceived difficulties of important food safety-related issues that are constraining the Nepalese Tea industry from attaining a higher level of export, the analysis has shown the significant correlation.
- xiii. Regarding the perceived constraining policy related factors of important food safety-related issues that are constraining the Nepalese Tea industry from attaining a higher level of export the analysis has found a positive correlation.

CHAPTER VII

REVENUE IMPLICATION OF TRADE LIBERALIZATION IN WTO REGIME

7.1 Trade Liberalization and the Low Income Economy

Nepal, like many other developing and least developed countries, has undergone to tariff liberalization regime and further regularized by the WTO agreements in recent years, adopting economic liberalization in early nineties of the last century. In this light, this chapter has attempted to measure the trade revenue impact on the Nepalese economy.

Successive rounds of global trade liberalization have substantially reduced tariff barriers to trade and they are, very often, claimed to have remained the potential source of fiscal instability for developing and least developed countries because of their high dependence on trade taxes for public revenue. For example, in Africa as a whole international trade taxes generated on average 28.2 percent of total current revenues over the last decade; for sub-Saharan Africa the share goes up to 30.5 percent. This compares to 0.8 percent for high-income OECD countries, 18.42 percent for lower medium-income countries, and 22.5 percent for low income countries (African Trade Policy Center 2004).

The impact of tariff cuts on a particular country is largely an empirical issue, as it depends inter alia on the initial trade value and tariff level; the size and mode of the tariff cut; and import demand and supply elasticities. While the effects of trade liberalization may include a decline in revenue from trade taxes, such an outcome is not unavoidable. Studies indicate that the net effect of trade liberalization on revenue, including second-round effects, could be positive since:

 (i) A reduction in tariffs could lead to higher import volumes, as a result of both income and substitution effects 5;

⁵ The import response to lower tariffs can be expected to be the most pronounced for consumer goods, for which, demand elasticities tend to be high, and lower for materials and intermediate goods.
- (ii) Demand could shift to items with higher tariff rates as a result of an income effect;
- (iii) A depreciation of the exchange rate following trade liberalization could raise the value of imports and tariff revenues in local currency; and,
- (iv) Over the longer term, revenue would be expected to increase as a result of higher economic growth, normally associated with trade liberalization.

Moreover, beyond the reduction in tariffs, the liberalization of the trade regime can involve a variety of measures, some of which would be revenue neutral or even serve to raise revenue (Ebrill, 1999). In particular, a conversion of non-tariff barriers (NTB) such as quotas, bans, and import licenses into tariffs would generate additional revenue, and administrative reforms could entail efficiency gains in customs administration. However, as the occurrence of NTBs has declined markedly, there is now less leeway to replace NTBs with customs duties in order to increase revenue from trade taxes. The impact of trade liberalization on tariff revenue is also determined by the extent of exemptions and preferences, and tariff revenue would increase to the extent that exemptions are reduced or abolished. Incentives to smuggle or misrecord would be reduced if tariffs were lowered or consolidated in the interest of greater transparency, thereby improving compliance and broadening the tax base (Fisman and Wei, 2004, Greenaway and Milner, 1991).

In the framework of multilateral trade liberalization, the difference between bound tariff rates (the subject of WTO negotiations) and applied statutory (most favored nation – MFN) tariff rates is also critical: in cases where applied rates are significantly lower than bound rates, the latter can be lowered in the context of trade liberalization agreements without a significant impact on revenue. However, in the event that trade liberalization took place in a bilateral/regional rather than in a multilateral (MFN) context, revenue could be affected negatively if bilateral or regional trade agreements diverted imports from dutiable to preferential sources, although the net effect of this would require detailed analysis.

Accordingly, the net impact of trade liberalization measures depends critically on a range of assumptions. While first-round effects are relatively easy to quantify, both the timing and the strength of second-round effects, reflecting behavioral responses to the change in trade policies, are more difficult to project. Only some of these effects can be simulated sensibly across countries.

Developing countries rely on import duties to a much larger extent than industrial countries. In African low income countries, import duties represented about 34 percent of total government revenue over the period 1999–2001, and exceeded 50 percent in a number of countries. In case, trade taxes are included in the base of domestic taxes on imports, the reduction in trade taxes is usually accompanied by a reduction in VAT revenue, and it may also lead to a reduction in excise duties (Fisman and Wei, 2004).

7.1.1 WTO and Trade Liberalization: An Overview

Tariff revenue concerns have emerged as an important issue in the framework of multilateral trade negotiations under the DDA and the issue has become critical almost for the developing and least developed countries. However, evidence on possible revenue consequence of tariff liberalization is varied, there is a general agreement that revenue consequences of trade liberalization has hinged, to a considerable extent, on the share of tariff revenue in total revenue of a country. As a rule, developing countries tend to rely heavily on trade tax revenue (Bhattacharya, 2006). This is underwritten by a lack of administrative capacity to mobilize income taxes and the relatively large size of the informal and subsistence sectors. Because, the lower share of direct (income) taxes is also because of unwillingness (or inability) of the governments in most developing countries to measure up to resistance to direct taxes causing from their national elite.

In many instances, it is thus a political issue and not so much as an administrative one. Asymmetric information and obvious constraints in taxing the subsistence sectors in developing countries have added to these difficulties. Domestic tax base is very shallow in these countries and governments in these countries try to meet their fiscal needs by charging high rates on formal sectors such as on trade (ATPC, 2004 and Kubota, 2000).

During the initial stages of trade reform, when non-tariff barriers are transformed into tariff barriers (tariffication of NTBs) and export subsidies are reduced and eliminated, there cannot but be some impact on the overall revenue situation of a country. Under these circumstances, the least developed countries like Nepal have experienced pressure from declining sources of revenue. The net effect of tariff reductions on revenue income remains uncertain; much depends on the initial structure of the tax system and the administrative capabilities of the particular country (Ebrill et al., 1999; Keen and Ligthart, 2002).

The negative fiscal impact may originate from the possibility that domestic revenue might not rise sufficiently to offset the fall in international revenue earnings due to tariff reductions. In addition, reduction in export taxes may lead to a decline in export revenues either through lower export tax revenues or through lower income earned from exports and consequently lower income from tax receipts. Devaluation of the exchange rate causes currency value of imports to rise, and if import responds to price changes, import may decline and revenue from import may also decline. Trade liberalization leads to reduction of import duties, and thus is like to reduce international trade tax revenue (Ebrill et al. 1999). On the other hand, there could also be favorable and positive impact of trade liberalization as a result of elimination of trade related subsidies and tariff reductions. For example, decline in revenue from tariff reductions can be more than offset by increases in import volumes as demand for import increases as a result of the lowering of the prices of import (Bhattacharya et al. 2006). There is also a possibility that lower tariffs may lead to an increase in the overall tax base of the country by lowering the marginal benefit to avoid taxation, resulting in a rise in overall revenue of the country.

Reducing tariff dispersion around a relatively constant average rate can also have a positive revenue impact in the sense that goods subject to higher tariffs are characterized by a high price elasticity of demand (ATPC, 2004). It is argued that higher tariffs create an incentive for importers to evade taxes by seeking exemption, which in turn, affects the productivity of the tax system and reduces revenue. Tariff reduction could thus lead to an increase in the overall revenue of the country.

Overall, gains from trade liberalization in terms of its impact on fiscal balances will be possible, if and when both the static and dynamic gains from trade work towards it. From the perspective of static gains, free trade could create opportunities for additional production and consumption, which could have positive impact on the revenue mobilization in the country (Khattry and Rao, 2003). On the other hand, dynamic gains may occur as a result of increasing returns to scale and

adoption of new technologies, managerial techniques and new goods (Krugman, 1990). However, overall gains will also depend on the movement from trade taxes to domestic income and consumption taxes such as the value-added tax (VAT) which is introduced to achieve a more efficient, less inequitable tax system during trade liberalization period. In many countries, such a change in the tax structure was an important and integral element of the trade liberalization policy pursued by these countries.

Over the past three decades, trade liberalization has resulted in a sharp decline in the overall importance of revenue derived from customs duties and trade taxes of developing and the least developed vountries. Reflecting commitments under trade liberalization agreements, as well as unilateral decisions, the collected import tariff rate⁶ fell by almost half since the mid 1980s. The trend has been most pronounced in low-income countries; however, even middle- and high-income countries experienced a sharp decline in the share of trade-derived revenue to GDP (IMF, 2005).

Since 1947, seven negotiation rounds under the GATT resulted in significant tariff reductions, although not covering trade in agricultural goods. Initially, the tariff negotiations under the GATT followed the request-and-offer procedure, under which members negotiated bilateral market access concessions which were subsequently extended to all members according to the MFN principle. Under the Kennedy Round (1963–67), a linear formula approach was introduced, resulting in a 50 percent cut of bound tariffs on all manufactured goods with the exception of "sensitive" goods, such as steel, clothing, textiles and footwear.

Moreover, the negotiation agenda was extended beyond tariffs to antidumping measures. With the Tokyo Round (1973–79), negotiations on non-tariff measures7 gained importance. Under the Uruguay Round (1987–94), all original GATT articles were reviewed and the WTO was established. The negotiation agenda was significantly expanded and covered trade in agriculture, textiles and apparel, and services.8 Key outcomes included the replacement of non-tariff barriers with bound

⁶ Actual tariff rate, once exemptions, preferences, and tariff evasion have been taken into account.

⁷ Government procurement, import licensing, subsidies, anti-dumping, customs valuation, and technical assistance.

⁸ The Uruguay Round also covered a number of new rules (e.g., on trade-related aspects of intellectual property rights), the establishment of a dispute settlement system, and other issues not directly relevant to this research.

tariffs, and the elimination—after a transition period—of quotas in textiles trade. The Agreement on Agriculture comprises specific binding commitments to improve market access and to reduce production-and trade-distorting domestic support and export subsidies; it also introduces a tariff rate quota9 and special safeguards provisions10. However, despite these results, agricultural tariffs remained high11 and complex, with a considerable dispersion, and tariff escalation prevails in important product chains. Agreements on Special and Differential Treatment were reached providing longer implementation periods and lower reduction commitments for developing countries.

The later rounds of trade negotiations demonstrated the superiority of a formula-based approach that limits the role played by special interest groups and enables the effective participation of smaller countries that would not be able to conduct bilateral negotiations effectively. The 35 percent reduction in average tariffs resulting from the Kennedy Round, based on a 50 percent proportional formula, compares favorably with the average reduction of tariffs by 2.5 percent in the second through the fifth rounds of GATT negotiations under the request-and-offer approach (Francois and Martin, 2003).

Negotiations under the Uruguay Round brought about substantial tariff reductions, based on broad goals, such as a 36 percent average reduction of tariffs on industrial products. However, the round was less successful in reducing tariff dispersion as it left the distribution of the cuts across sectors to negotiations between trading partners. Formulae that would have harmonized tariffs in addition to reducing averages were proposed but not adopted – such as the Swiss formula12 that had originally been put forward by Switzerland in the Tokyo Round negotiations. The Swiss formula narrows the range of final tariff rates from a wide set of initial tariffs by applying steeper cuts to higher tariffs, while fixing a maximum final rate. It

⁹ Provision of market access at a zero or low tariff for a fixed quantity of a product, while additional quantities could be charged a higher tariff.

¹⁰ Made available for countries that converted their non-tariff barriers to tariff-only regimes; allows importers to increase tariffs above the bound rate in response to a surge in imports or a sharp decline in import prices.

¹¹ The world-wide simple average of agricultural bound (applied) tariffs is estimated at 62 (17) percent, compared to 29 (9) percent for industrial products (OECD, 2004).

¹² The formula is defined as Z = AX/(A+X), with X = initial tariff rate; Z = resulting lower tariff rate; and A = coefficient and maximum final tariff rate.

maintains the simplicity of a linear formula, requiring negotiations over only one coefficient, while reducing higher tariffs by more in both absolute and relative terms.

Negotiations on the Doha Development Agenda began in November 2001 with the aim to agree on liberalization and rules in agricultural, industrial and services trade, with special consideration of the needs of developing countries. First substantive results were reached at a WTO General Council meeting in Geneva in July 2004, which adopted framework agreements for establishing modalities in the different negotiating areas (July Framework), including, crucially, agreements on the reduction of tariffs and domestic (agricultural) subsidies using harmonizing formulae, and the discontinuation of export subsidies.

At the sixth Ministerial Conference of the WTO in Hong Kong in 2005, trade ministers reached agreement on several outstanding issues but did not converge fully on negotiating modalities. The text on market access in agriculture goes slightly beyond the July Framework in adopting the principle of four tariff bands subject to progressively higher cuts, but fails to specify the thresholds of the bands and the size of the cuts. Absolute tariff caps were proposed by some (EU, United States, and G-2013) but rejected by others (G-1014). It was agreed that "sensitive products" can be excluded from formula cuts—though there would still need to be greater effective market access—and that developing countries can also make use of special product designations and a special safeguard mechanism15. Regarding non-agricultural market access (NAMA), the Ministerial adopted a Swiss formula approach while reaffirming less than full reciprocity and special flexibilities for developing countries.

The Ministerial also made progress in some other areas, e.g., setting a 2013 deadline for eliminating agricultural export subsidies and reaching agreement on dutyand-quota-free access to industrial country markets for products from low income countries. In a statement relevant to this research, the final declaration also calls for greater clarity on the scope of the problem of tariff revenue dependency16.

¹³ The G-20, formed in 2003 for the WTO negotiations, comprises: Argentina, Bolivia, Brazil, Chile, China, Cuba, Egypt, Guatemala, India, Indonesia, Mexico, Nigeria, Pakistan, Paraguay, Philippines, South Africa, Tanzania, Thailand, Uruguay, Venezuela, and Zimbabwe.

¹⁴ In the context of WTO negotiations, the G-10 is composed of Bulgaria, Taiwan Province of China, Korea, Iceland, Israel, Japan, Liechtenstein, Mauritius, Norway, and Switzerland.

¹⁵ For an analysis of the special safeguard mechanism see Hallaert (2005).

¹⁶ Hong Kong Ministerial Declaration (WT/MIN(05)/DEC).

7.1.2 Trade Liberalization After 1990s

The process of trade liberalization and market-oriented economic reform that had started in many developing countries in early 1980s and intensified in the 1990s. The reform undertaken varied in ownership and contents in different countries. The reforming countries can be classified into three groups. The first group, consists of a number of countries in East Asia, continued their own dynamic industrial and trade policies initiated in 1960s. The second group, which includes a large number of countries, mostly in Africa, has gone through the reform programs designed and dictated by the International Finance Institutions (IFIs). The third group comprises a number of Latin American countries that undertook economic reform since early 1980s, initially under the pressure from IFIs. Nevertheless, in 1990s they intensified their reform process without having been necessarily under pressure of those institutions in all cases (Shafaeddin, 2005).

The contents and philosophy of their reform programs were, however, similar to those designed by the IFIs, which in turn have been referred to as the "Washington Consensus" since the early 1990s. Universal and uniform trade liberalization was a part of that consensus. Universal implies that all developing countries are to follow the same trade policy regime-trade liberalization-irrespective of their levels of development and industrial capacities. Uniform implies that all sectors and industries are to be subject to the same tariff rates-preferably zero rate or low rate (ibid). Apart from trade liberalization, such reform programs included mainly: capital account liberalization, devaluation at early stages of reform to compensate for trade liberalization, fiscal and financial reform through contractionary macroeconomic policies such as budget cuts, increase in interest rates and privatization.

Trade liberalization measures, in particular, are believed to be a reaction to the failure of traditional import substitution policies of the 1950s–1970s. The philosophy behind the reform programs was that the role of government in making decisions on resource allocation should be minimized and the incentive structure should change in favor of exports through import liberalization in order to follow an export promotion path instead of import substitution. It was argued that private agents, guided by the operation of market forces, would better achieve the objectives of growth and diversification of exports and output structure in favor of manufactured goods. Such objectives would in turn be attained through the expansion of investment, better channeling of resources and allocation of investment outlays to productive sectors.

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The change in the structure of incentives would not only lead to growth and diversification but also to the upgrading of the production structure, facilitated by imported technology and improved skills enhanced by trade.

7.1.3 Trade Revenue Dependency: Empirical Observations

There is no established definition of the level required for a country to be considered highly dependent on tariff revenue, simply because there is no consensus, from a fiscal point of view, around the need to move taxation away from tariffs. While the cost of raising \$1 of tax through tariffs is higher than the cost of raising \$1 though other types of taxation (for instance, output taxation) in a number of WTO members, the opposite is true in other countries. Structural differences among countries (patterns of employment, production, administrative capacity to raise taxes, etc.), do not allow making one clear-cut single recommendation in that regard (Santiago et al. 2005).

The evidence remains, however, that because of the comparative ease to collect import duties when a product crosses national borders, many developing countries have based their tax systems largely on tariffs. Where tariff revenues account for more than 50 percent of government revenues, there is little doubt that dependency would be considered high. However, what is high? What are the parameters to define a significant level of reliance? While tariff dependence is undisputedly very pronounced in some developing countries, particularly in Sub-Saharan Africa, the Caribbean and the Pacific, it is lower, but still significant in many other countries. The United States has suggested in a Communication to the NGMA3 that a 10 percent dependency level is not substantial and would thus not need any particular treatment in the negotiations apart from extended periods for the implementation of tariff reductions. The communication suggests that only a dependency level of 20 percent or above would be considered as high (South Centre 2004). The Table hereunder presents tariff revenues as a percentage of total taxes collected in WTO developing country members where that ratio is above 10 percent.

S.N.	Country	Share (%)	S.N.	Country	Share (%)
1	Algeria	12.1%	2	Bangladesh	30.0%
3	Burundi	16.4%	4	Cameroon	31.6%
5	Congo D.R.	33.7%	6	Congo R.	23.2%
7	Cote d'Ivoire	27.6%	8	Dominican R.	44.1%
9	Ethiopia	26.3%	10	Guinea	42.9%
11	India	24.1%	12	Iran	14.4%
13	Jordan	20.4%	14	Lebanon	39.0%
15	Madagascar	53.5%	16	Mauritius	29.3%
17	Morocco	18.8%	18	Nepal	21.65%
19	Oman	10.3%	20	Pakistan	15.4%
21	Papua New Guinea	24.2%	22	Paraguay	17.5%
23	Peru	10.5%	24	Philippines	19.6%
25	Sierra Leone	49.8%	26	Sri Lanka	27.4%
27	Swaziland	54.7%	28	Syrian A.R.	11.7%
29	Thailand	12.3%	30	Tunisia	12.5%
31	Uganda	50.3%	32	Venezuela	12.1%

 Table 7.1: Import Duties as a share of Total Tax Revenue in some Developing

 and Least Developed Countries

Source: Calculated from Government Finance Statistics, 2010, IMF.

The disadvantage of using a percentage level to approach high dependency is that countries below the chosen level (which would most likely be negotiated) would be unable to benefit from flexibilities under this heading. Such an approach might reveal to be unfair and arbitrary, excluding countries that will face great challenges despite a relatively small dependency in percentage points. For instance, in 2001, taxes on international trade transactions accounted for only 4.45 percent of total government revenue in Bolivia. That amount of resources corresponds, however, to more than the central government spent on housing or agriculture, forestry, fishing and hunting in the same year. In other words, a small dependency on international comparative terms could hide resources which are domestically very important (ibid).

7.1.4 Fiscal Costs of Trade Liberalization

Some researchers are of the view that trade liberalization threatens to undermine developing countries' macroeconomic stability. The import surges which have been experienced as a consequence of trade liberalization have impacted on the trade balance of developing countries at the same time as their own industries have come under pressure from external competition. To name but two examples, the Philippines and Mexico both suffered worsening current account deficits during the 1990s as a result of industrial trade liberalization (SAPRIN, 2004).

The problem in the least developed countries is exacerbated by the fact that most growth takes place in the import of finished products and consumer goods rather than intermediate inputs or capital goods, thus hampering a country's ability to earn export earnings by developing its own dynamic export sector. On the other hand, the country has no a wide leverage to enjoy higher tariffs for finished products. Following liberalization in the 1980s, Uganda experienced a massive surge in consumer imports, which in their turn claimed 40-60 percent of the country's total foreign exchange. As a result, the capacity utilization rate in the industrial sector languished at 22 percent (Buffie, 2001).

In addition, there is a growing recognition of the fiscal threat posed to developing countries through Non Agricultural Market Access (NAMA) liberalization. Steep tariff cuts are likely to result in a significant overall drop in state revenue, given that developing countries rely to a greater extent on customs duties than developed countries (Ebrill, L. et al. 1999). This entails damaging consequences for already fragile government programs, as fiscal constraints may well require budget cuts across departments such as health, education and other public services. As a result, the Doha Round would again militate against the attainment of the Millennium Development Goals and the reduction of poverty worldwide.

Import Market	%	Import Market	%
Bahamas	55.9	Maldives	28.3
Bangladesh	22.6	Mali	12.0
Barbados	11.2	Mauritania	30.1
Belize	49.0	Mauritius	25.0
Benin	56.0	Morocco	15.9
Botswana	12.4	Namibia	37.1
Burkina Faso	14.3	Nepal	22.5
Burundi	20.2	Niger	36.4
Cameroon	28.3	Pakistan	12.2
Central African Republic	39.8	Panama	10.7
Chad	15.3	Papua New Guinea	27.3
China	9.5	Paraguay	10.3
DR Congo	31.9	Philippines	17.2
Côte d'Ivoire	41.8	Rwanda	31.1
Dominica	19.6	Samoa	50.2
Dominican Republic	42.8	Senegal	36.5
Ecuador	11.3	Sierra Leone	48.6
Egypt	12.6	Solomon Islands	57.1
Ethiopia	26.0	Sri Lanka	11.3
Fiji	21.5	St Kitts & Nevis	37.0
Gabon	17.4	St Lucia	26.5
Gambia	42.8	St Vincent & Grenadines	40.3
Ghana	26.8	Sudan	29.0
Grenada	18.2	Suriname	22.9
Guatemala	15.0	Swaziland	51.9
Guinea	76.6	Syria	9.9
Guinea-Bissau	37.1	Tajikistan	15.9
Haiti	21.4	Thailand	10.4
Honduras	42.4	Togo	35.4
India	18.5	Tonga	48.4
Jordan	16.8	Tunisia	11.5
Kenya	13.8	Uganda	49.8
Lebanon	28.1	Vanuatu	36.2
Lesotho	47.7	Vietnam	18.1
Madagascar	51.9	Yemen	10.3
Malawi	16.3	Zambia	15.8
Malaysia	12.7	Zimbabwe	20.5

Table 7.2: Tariff Revenues as Percentage of Tax Revenues of Selected Countries

Source: Calculated from Government Finance Statistics 2010, IMF.

The above should be compared with the corresponding figures for the USA (1%), Canada (1.3%) and Japan (1.3%). Calculations of potential revenue losses arising from different trade liberalization scenarios confirm that under ambitious

variants of the non-linear formula currently being proposed by developed country members of the WTO, many developing countries would risk losing over 50 percent of the tariff revenues they currently collect from non-agricultural trade (Fernandez de Cordoba, et al. 2004). Trade liberalization for the developing and least developed countries perspective thus poses some long run and short run implications.

7.1.5 The Long-Run Implications

In the context of the neo-liberal model, which predicates long term gains from trade and investment liberalization through the growth of GDP, there is no question that, even if there are some negative fiscal impacts in the short term, liberalization will compensate and, lead eventually, to larger fiscal revenue derived from growth of economic activity that serves as base for taxation (Caliari, 2007).

A number of free trade negotiations tend to be driven by the assumption that the financial consequences of liberalization of trade and investment will lead to enhance income through bigger exports and attraction of FDI. This type of analysis leads, for instance, to recommend borrowing in order to finance public finance adjustment that may become necessary when trade is liberalized. In order to implement this adjustment, which is deemed temporary, the International Monetary Fund (IMF) has launched Trade Integration Mechanism (TIM). Originally, this mechanism did not contemplate the loss of fiscal income, at least not explicitly, as one of the situations where it would be applicable. In a recent reformulation of the mechanism, made in the framework of the discussion on "Aid for Trade", this situation was explicitly added (ibid). The TIM would, thus, be a mechanism for countries to be able to borrow from an existing facility, or augment an already outstanding loan, with the purpose of financing fiscal revenue lost due to trade liberalization.

However, except for some facilities such as the Poverty Reduction and Growth Facility, which is not relevant to the case of fiscal reforms, are not concessional. This means that a rate similar or very close, to the market rate must be paid for borrowed funds. Therefore, the proposal is, basically, to increase debt in order to repair what is considered to be a temporary adjustment of the balance of payments (ibid). This only makes sense, if it is certain that liberalization leads to increased growth, hence enabling repayment. But the support to this assertion in reality is, until today, still uncertain. Several studies have shown that there is no systematic relationship between the average tariff and non-tariff barriers of a country and its economic growth. (Malhotra, K. 2004) Similarly, the evidence does not support the assertion that increased FDI leads to increased growth. (Milberg 1999; UNCTAD 2003). And the very link between investment liberalization and increased FDI – or increased investment altogether—is not exempt from challenges.

7.1.6 Short-Run Implications

Negative fiscal impacts have received a renewed attention on severe fiscal deficits and developing countries have complained that the pressure to liberalize puts them in the dilemma of either to breach trade commitments or fuel unsustainable fiscal deficits (eventually fueling larger public debt). Paradigmatic of this, is the case, that Argentina brought before the WTO in the late 1990s, to be allowed to impose a tax that it considered necessary under the conditions of its agreement with the IMF (Caliari 2007).

It is important to bear in mind that, for low income countries, trade-related taxes are an important source of income that normally diminishes when they liberalize (WTO 2003; Wise and Gallagher 2006). While those defending the benefits of trade liberalization argue that the losses are small, researchers have found that tariff losses for developing countries could outweigh the benefits by a factor of four. Moreover, these losses are not reported in the discussions of trade gains because the modeling exercises assume that fiscal balances of governments are fixed, that is, that tariff income losses will be compensated by other taxes (Wise and Gallagher 2006). These same researchers quote UNCTAD which has shown that just tariff losses related to NAAM –the industrial goods agreement being negotiated in the WTO Doha Round - could reach 63.4 billion dollars.

Against this backdrop, trade liberalizers also argue that government revenue losses should not be an obstacle to liberalize as they can be recovered by resorting to other taxes. But the capacity of low-income countries to recover income losses is limited. Implementing other taxes, such as value added taxes, demand more administrative capacity that many countries do not have, and has negative

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consequences for income distribution (Economic Commission for Africa 2004). A study that looked at a panel of 84 countries between 1970 and 1998 concluded that low- and middle-income countries had experienced lower fiscal income as a result of a fall in trade related tariffs and income, with structural characteristics justifying this reduction. (Khattry and Rao 2002).

More recently, IMF researchers have accepted the reality of the practical problems of recovering the income lost from trade-related taxes. This study, reviewing a panel of information of 125 countries concludes that middle-income countries had been able to recover between 35 and 55 cents per dollar of income from lost trade income, whereas lowest income countries had recovered basically none (Baunsgaard and Keen, 2004).

Looking further into distributional impacts, a study conducted by Stiglitz and Emran (2005) stated that the general consensus on the virtues of replacing trade taxes income with taxes on internal consumption does not take into account the structure of developing countries. The larger the sector of the informal economy, the larger the welfare costs of such a policy as this will increase inter-sector distortions between the formal and informal sectors (ibid).

Investment liberalization also brings negative fiscal consequences. A commonly understood manner this happens is through the phenomenon of tax competition. The cost of strategies based on less taxation as a way to attract FDI may well outweigh the benefits expected from such investment flows. The costs are associated with loss of income for the recipient government and the difficulties of administering in an effective manner such schemes, especially in developing countries (Morisset et al, 2001). Nor should the impact of practices such as transfer pricing be underestimated. Transfer pricing is associated with the growing internationalization of cross-border transfers of goods, services, know-how, technology and intellectual property between "parent" and affiliated companies. While the purpose of Framework Agreements on Transfer Pricing is to promote reasonable fiscal income for all countries involved, this is far from being the most common case. Thus, the transfer pricing has direct effects on the fiscal income of recipient and source countries (UNCTAD 1999b). Paramount among the measures that could reduce the revenue damage caused by transfer pricing are some performance requirements, typically

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banned by in investment liberalization processes and rules (Tang 2003). Certainly, two key measures to reduce the possibility of this practice are local sourcing and foreign exchange balancing requirements, both banned by the TRIMS agreement of the WTO.

It may be in the area of services, however, where the greatest problems to prevent transfer pricing are observed. The complexity of services transactions, the relative novelty and innovation they present and the difficulty to value and price the different components may be an insurmountable difficulty for public agencies. This is even the case in the most advanced countries. Therefore, it is even more of a problem in developing countries, given their difficulties to regulate such activities. In a survey, UNCTAD revealed that 41 percent of developing countries did not, at all, address services in their regulations, administrative guidelines and requirements on transfer pricing.

More in general, a number of studies have pointed out the inevitable result of free movement of capital tends to be a greater difficulty in taxing capital and a consequent increase in the weight of wages and consumption taxes in the total fiscal revenue. (IDB 2004) These trends are not unique to developing countries and the same trends have been found in OECD countries (Ibid.) but in the former is where they show themselves with the more intensity because the difficulties and flaws of the control infrastructure on mobile capital are, obviously, greater.

It is worth noting that the World Bank and the IMF also encourage lower tax levels with their packages of recommendations to improve the investment climate and, that way, attract FDI and promote exports. The hypothesis seems to be that a lower tax level on export gains is a precondition to increase exports, without which the necessary investment for production and exports might not take place. At the same time, export-oriented FDI would go up. From a perspective of growth and capital accumulation it is worth asking, of course, to what extent is it beneficial to increase exports whose revenue cannot be appropriated domestically?

An example of the evaluation of investment climate by the World Bank is its Annual "Doing Business" report, published since 2004, which includes a ranking of economies based on "the ease of doing business." Governments get desperate to climb up those rankings because they guess the higher up they are in the ranking, the more foreign investment is going to seek the country. It has been observed that the rankings do have an impact in making countries introduce reforms. Regarding the fiscal theme, taxation is one of the criteria taken into account in preparing the "Doing Business" report, and one of the three elements that are considered within this item is that the lower taxation on companies is, the higher in the ranking the country will be. Like the other indicators, this applies to all countries in a one-size-fits-all fashion, no matter what is the revenue profile (or efficiency of public revenue use) in each case, which makes the indicator completely indefensible.

It is important to explain the role of agencies such as the Bank and IMF because it shows that the liberalization of investment does not only come from treaties, but also from conditions imposed and the pressure that emerges from rankings created by external factors that generate a perception that more investment can be lured by applying certain policies.

7.1.7 The Expenses Implications

In assessing the fiscal impacts of liberalization, it is not enough looking at the income aspect, but it is also necessary to look at expenditures, and the increased public expenses generated by trade liberalization. The demands of a growing regulatory and institutional burden as a result of trade agreements has been mentioned as a source of expenses that adds to the shattered budgets of low-income countries engaged in liberalization. A widely cited review of the impact of new rules on developing countries puts the costs of compliance in only three areas: customs valuation, TRIPS and sanitary and phytosanitary measures, around 150 million dollars per country. (Finger and Schuler 2000).

This estimate not only does not include all rules. It also does not include all costs a government needs to incur in order to modernize systems of production and infrastructure so they can respond to the demands of a more intense competition. The taking of large "competitiveness loans" that accompanies the signing of trade agreements in countries such as Costa Rica, Colombia and Perú, shows the impact of these infrastructure on public coffers.

The cost of provision of basic services by the State in the face of the dislocation of employment conditions created by trade liberalization, the inequalities of coverage brought by services liberalization or the adoption of patent protection, is

relatively less studied, but can be considerable, as researchers from UNDP have brought to attention. (Heuty 2004) For instance, the state must absorb the burden of dislocation of employment conditions created by trade liberalization. It also must absorb the gap services liberalization opens in the access to essential services for a sector of the population, inequalities of coverage, as well as the provision to entire sectors that are priced out of coverage due to rate increases. At the same time, because of the same liberalization process, the state does no longer have the taxing and crosssubsidizing capacity that it had when it was in charge of the general provision.

7.2 Revenue Impact of Trade Liberalization

Despite significant trade liberalization in the recent years, many developing and emerging market economies, including the South Asian countries, continue to rely heavily on trade taxes as a source of government revenue. Trade taxes in these countries still figures for an average of about one-quarter of all Sub-Saharan government revenues, and in the developing countries of Asia and the Pacific, they account for around 15 percent (Baunsgaard and Keen, 2005). A significant concern for many countries as they contemplate further liberalization - whether in the context of proliferating regional agreements, bilateral agreements, or in relation to multilateral tariff liberalization under the WTO framework - is thus the potential impact on tax revenues. These concerns are emerging ever more clearly as a potentially significant obstacle to further trade liberalization for these countries. For example, Nepal has already undergone a revenue loss due to fulfillment of WTO showed that the cuts in tariff on imports from India up to the level of Rs 276 million and the revenue loss from third country imports is estimated to be in the range of Rs. 193 to Rs 152 million. On the other hand, the revenue loss due to the abolition in the agriculture development levy, special charges and local development fee will be substantial. Calculations show that in the first year the total revenue loss would be in the order of Rs. 433.5 million with further increment in the following years (Khanal, 2006).

In the early stages of liberalization, the revenue consequences of reform may be relatively minor (Baunsgaard and Keen, 2005). Indeed the first steps of trade policy reform — often involving the reduction of prohibitively high tariffs, tariffication of quotas, elimination of exemptions, and raising of low tariff rates in moving towards a more uniform tariff — may plausibly lead to an increase in trade tax revenues. In other words, revenue tends to be least affected if the initial position of the trade regime is highly restrictive and if liberalization is accompanied by reforms in customs and tax administration, also with the aim to broaden the tax base. The revenue impact is reduced if measures involve the tariffication of quantitative restrictions; the auctioning of licenses; a reduction in tariff dispersion; and the elimination of exemptions (Agbeyegbe et al., 2004 and Ebrill et al., 1999). There must come a point, however, at which further movement towards freer trade reduces trade tax revenues, particularly for the least developed countries that are week in trade competitiveness, which invites import dependency and has a serious balance of payment implications.

However, the impact of trade liberalization and its revenue consequences in Nepalese economy gives an expected result, while taking it into some of the theoretical references of tariff liberalization has an adverse impact on revenue in the short run. Unlike in many developing and least developed countries, decline in tariff revenue to GDP ratio has had no much adverse effect on domestic revenue. The custom revenue to import coefficient was found to be positive during the one and half period (1990 to 2005) of trade liberalization when intensive trade liberalization was carried out (Khanal, 2006). Similarly, the openness variable was also found to be positive with high level of significance as tariff rate (import duty as % of total input) declined, trade to GDP ratio has increased, import taxes-import ratio declined, and effective tax rate (total trade taxes-trade ratio) declined (Figure 5.1 - 5.5).

The following section has explained the revenue implications of trade liberalization in different macrocosmic parameters of Nepalese economy applying statistical and econometric considerations.

7.2.1 Elasticity of Trade Revenue: Productivity of Trade Openness Variable

One of the important issues that currently came into place in the developing and least developed world, which, in fact, called a wide debate, is whether trade liberalization really brings about an increase in developing countries' trade. Scholars have contradictory stands on this issue. On the one hand, some studies show that countries which embarked on liberalization programs have promisingly improved their performance on custom revenue; while on the other hand, however, other studies have found little evidence of a positive relationship between liberalization and the growth in trade tax revenue. For making this issue more robust to analyze, this segment has tried to assess a simple calculation of the productivity of trade openness variable (trade revenue index) through the measurement of elasticity of trade tax revenue taking equation 3.2.16 keeping other intervening variable constant ignoring econometric models.

While running this model in time series data for custom revenue and trade revenue index, the following results can be obtained that is presented in table 7.3 The model not surprisingly shows that like in the most of the studies reviewed in this study the average elasticity coefficient in the post-liberalization period is found to be lesser ($E_{ttr} = 2.07$, elasticity, which implies that a one percent change in trade revenue index brings about 2.07 percent change in trade tax revenue) than that of the preliberalization period ($E_{ttr} = 2.31$). The table indicates also the sharp reduction in the average trade revenue index to 7.52 in the post-liberalization period, which was 11.72 in the pre-liberalization period.

Table 7.3: Elasticity coefficients of Trade Tax Revenue in the Pre- and Post

liberalization Periods

Fiscal Year	Total Trade Volume	Trade Tax	TRI	Ettr
1974-75	20948.63	2544.96	12.15	
1975-76	24405.89	2762.25	11.32	-1.16
1976-77	25348.56	3085.52	12.17	1.52
1977-78	25682.09	3351.28	13.05	1.19
1978-79	27774.01	4162.71	14.99	1.56
1979-80	28583.17	3753.06	13.13	0.78
1980-81	34523.89	4665.62	13.51	7.52
1981-82	33583.86	4315.23	12.85	1.55
1982-83	34679.22	3543.91	10.22	0.86
1983-84	35980.53	3615.78	10.05	-1.20
1984-85	43201.76	4386.58	10.15	18.63
1985-86	44736.44	4434.65	9.91	-0.45
1986-87	44427.33	4813.71	10.84	0.92
1987-88	51325.82	6320.66	12.31	2.12
1988-89	52433.17	5868.70	11.19	0.78
1989-90	54338.66	6213.18	11.43	2.67
1990-91	64870.33	6450.76	9.94	-0.27
Average Elastic	city Coefficient	11.72	2.31	
1991-92	81296.99	5982.22	7.36	0.25
1992-93	90703.48	6336.30	6.99	-1.11
1993-94	106409.74	7890.98	7.42	3.66
1994-95	114415.41	9874.48	8.63	1.47
1995-96	123012.22	9554.77	7.77	0.31
1996-97	141295.76	10104.52	7.15	-0.68
1997-98	136273.74	9944.01	7.30	-0.79
1998-99	132223.23	10214.62	7.73	0.47
1999-00	162485.00	11097.24	6.83	-0.67
2000-01	171341.30	12552.10	7.33	1.76
2001-02	148540.62	12183.58	8.20	-0.26
2002-03	162728.94	13292.65	8.17	-21.21
2003-04	170725.13	13962.99	8.18	39.99
2004-05	176423.14	13306.44	7.54	0.59
2005-06	185431.38	12158.48	6.56	0.64
2006-07	187649.70	12339.44	6.58	5.13
2007-08	196783.90	14739.33	7.49	1.36
2008-09	212276.73	16150.03	7.61	5.85
2009-10	233454.51	18857.73	8.08	2.58
Average Elastic	ity Coefficient		7.52	2.07

Figures of total trade revenue & trade tax in million (at constant price base year 2000-01=100)

Source: Author's calculation from Appendix XIV

The trade tax elasticity of the post-liberalization is also supported by the principle that the conversion of non-tariff barriers such as quotas, bans, and import licenses into tariffs would generate additional revenue, and administrative reforms could entail efficiency gains in customs administration.





The analysis derived from the table 7.3 can be represented by the figure 7.1, where InTTR represents the natural log of trade tax revenue.

7.2.2 Relationship between Trade Liberalization Measures and Revenues

Against the theoretical backdrop of revenue implications of trade liberalization and of WTO framework in the recent years, this analysis¹⁷ has attempted to analyze impact of trade liberalization on various macroeconomic parameters. For this, this study has assessed the determinants of different revenue components trade liberalization. There has been established the functional relationship of total revenue on population size (pop), real per capita GDP (pcRGDP), and the index of openness (tt). This study, like other theoretical explanations, uses two indexes of openness: import taxes as percent

¹⁷ This section of the study has followed the model specified by Khattry and Rao (2002), Baunsgaard and Keen (2005), and Bhattacharya et al (2006).

of total import (tt_1) and total trade as percent of GDP (tt_2) . The study has assumed that the tax revenue function is nonlinear in the scale of the economy because population size and per capita income are entered in the form of logarithms in the function. The following equation is used to estimate the determinants of tax revenue in Nepal during the two different periods of time.

As shown in different literature, the size of the population and tax revenue are positively correlated because tax revenue is expected to rise with the rise in population size. Khattry and Rao (2002) suggest that a positive relationship between population size and tax revenues is to be found if there are economies of scale in tax collection arising from fixed administration costs. It is predicted that per capita real GDP would be positively related with the ratio of tax revenues to GDP as both the volume of taxes and coverage of taxes increase if per capita real GDP of the country increases. Furthermore, both the indexes of openness and the tax revenue/GDP ratio should be positively correlated.

Likewise, another widely used examination to assess the impact of trade liberalization is trade tax revenues' relation with trade openness indexes including the GDP of the economy. For this, the determinants of trade tax revenue (TT) are estimated by regressing the share of trade taxes in GDP on both the indexes of openness (tt₁ and tt₂) and logarithms of per capita real GDP (ln pcRGDP). It is assumed that the relationship between the effective rate of trade taxation and trade tax revenue is nonlinear because high rates of trade taxation may lead to declining overall trade revenue for the country.

While dealing with the above equation, it is assumed that both the indexes of openness, i.e., import taxes as percent of total imports and total trade as percent of GDP are positively correlated with the ratio of trade taxes to GDP. However, it is also assumed that a high level of openness puts a constraint on the trade taxes/GDP ratio so that a negative relationship is expected between trade taxes to GDP ratio and tt². The level of income is predicted to be positively correlated with the share of trade taxes to GDP.

Similarly, the analysis of trade liberalization impact on non-trade tax is another parameter to assess its effect on non-trade measures. The effect of openness on non-trade tax revenue or domestic tax revenue has been examined by through the regression of non-trade tax and the natural log of real per capita GDP (pcRGDP), and both the indexes of openness (tt₁ and tt₂). The variable of VAT is also included as independent variable to see the effect of VAT on domestic tax revenue. For this, real GDP per capita is expected to be positively correlated with non-trade taxes or domestic taxes because it could potentially affect the demand for public expenditures, and perhaps proxy for administrative capacity of the country (Baunsgaard and Keen, 2005). VAT represents a portion of revenue lost due to trade liberalization or reform measures so that a positive correlation is expected between VAT and non-trade taxes revenues.

7.2.3 Results of Unit Root Test

Before analyzing the relationships among the variables mentioned above to measure the impact of trade liberalization on national economy, this study has first examined the unit root of the variables to determine that whether these variables can be considered as stationary or non-stationary processes. The results of DF, ADF and PP tests on both the level form and their first difference with and without trend term are reported in Table 7.4 and 7.5. The variables that are reported in table are used to estimate the determinants of tax revenue, trade tax revenue and non-trade tax revenue both in pre and post trade liberalization periods.

i. Unit Root Test of Variables Without Trend

The unit root tests for the tax revenue variable as percentage of GDP (TR) presented in table 7.4 suggests that it is non-stationary in without trend at level as DF, ADF and PP tests on TR could not reject the null hypothesis of non-stationarity. But DF and PP are appeared to be stationary in the first difference (ΔTR) at 1 and ADF is found to be stationary at 5 percent level of significance. The unit root tests of the natural log of the size of population (lnPOP) seems to be stationary at level as DF and PP are found to be significant at 1 and 10 percent level of significance while ADF is found to be non-stationary. They all are found to be stationary in the first difference. The unit root test for the natural log of per capita real GDP (lnpcRGDP) show that they are nonstationary in level, which also could not reject the null hypothesis of non-stationary on without trend term. But all DF, ADF, and PP found to be stationary in first difference at 1 percent level of significance. Likewise, the two indexes of openness, namely the custom duties as percentage of total import (tt_1) and the total trade as percentage of GDP (tt_2) also appear to be non-stationary on without trend term at level and therefore, all DF, ADF and PP tests could not reject the null hypothesis of nonstationarity on without trend term. But their respective first difference Δtt_1 , and Δtt_2 reveal stationary properties at one percent level of significance.

The unit root tests for the trade tax revenues as percentage of GDP (TT) gives a bit unexpected result as it seems stationary on DF and PP at 10 percent level of significance and also suggests the stationary properties both on ADF test at 5 percent level of significance. This variable can sometime regarded to reject the null hypothesis of non-stationary but the DF and PP test value seems weak to reject it as it is hardly cross the 10 percent significant level. All DF, ADF, and PP tests of Δ TT are found to be stationary at one percent level of significance in this case. Similarly, the unit root tests for the non-tax revenue as percentage of GDP (NTT) suggest that it is non-stationary in without trend at level. But, their respective first difference Δ NTT as DF and PP reveal stationary properties at 1 and ADF at 10 percent level of significance.

S. N.	Variables	DF	ADF	PP
1	TR	1.16	0.63	0.93
2	ΔTR	-3.90*	-3.46**	-3.86*
3	lnPOP	-4.71*	-1.92	-2.63***
4	ΔlnPOP	1.09	2.43	1.42
5	ln pcRGDP	-0.18	0.30	0.35
6	∆ln pcRGDP	-9.23*	-6.60*	-10.31*
7	tt ₁	-1.65	-1.54	-1.73
8	Δtt_1	-6.10*	-4.31*	-6.10*
9	tt ₂	-1.25	-1.10	-1.24
10	Δtt_2	-5.84*	-5.10*	-5.84*
11	TT	-2.69***	-3.29**	-2.71***
12	ΔΤΤ	-4.90*	-4.49*	-4.82*
13	NTT	2.20	1.63	2.05
14	ΔΝΤΤ	-3.94*	-2.72***	-4.02*

Table 7.4: Results of the DF, ADF and PP tests Without Trend

Source: Author's calculation based on Appendix XV

	Significance of Uni	t Root Test without	Trend	
	DF a	and PP	A	DF
Critical Value at	Level	1st Diff.	Level	1st Diff.
* 1% level	-3.63	-3.64	-3.63	-3.64
** 5% level	-2.95	-2.95	-2.95	-2.95
*** 10% level	-2.61	-2.61	-2.61	-2.61

ii. Unit Root Test of Variables With Trend

The unit root tests for the tax revenue variable as percentage of GDP (TR) presented in table 7.5 suggest that it is non-stationary in with trend at level as DF, ADF and PP tests on TR could not reject the null hypothesis of non-stationarity. But all DF, ADF, and PP are appeared to be stationary in the first difference (ΔTR) at 5 percent level of significance. The unit root tests of the natural log of the size of population (lnPOP) seems to be stationary at level as ADF and PP are found to be significant at 1 and 5 percent level of significance while ADF is found to be non-stationary. They all are found to be stationary in the first difference. The unit root test for the natural log of per capita real GDP (lnpcRGDP) show that they are stationary in level as DF and PP are found to be significant at 5 percent level of significance, while ADF is stationary. But all DF, ADF, and PP found to be stationary in first difference at 1 percent level of significance. Likewise, the one of the indexes of openness, namely the custom duties as percentage of total import (tt₁) appeared to be stationary as DF and PP are found to be significant in level at 10 and ADF at 5 percent level of significance. But all DF, ADF, and PP found to be stationary in first difference at 1 percent level of significance. The unit root for another index of openness, the total trade as percentage of GDP (tt₂) also appear to be non-stationary on without trend term at level and therefore, all DF, ADF and PP tests could not reject the null hypothesis of nonstationarity on without trend term. But their respective first difference Δtt_2 reveal stationary properties at 1 percent level of significance.

The unit root tests for the trade tax revenues as percentage of GDP (TT) seems stationary on ADF at 10 percent level of significance and non- stationary properties on DF and PP test. All DF, ADF, and PP tests of Δ TT are found to be stationary at one percent level of significance in this case. Similarly, the unit root tests for the non-tax revenue as percentage of GDP (NTT) suggest that it is non-stationary in with trend at level. But, their respective first difference Δ NTT as DF ADF and PP reveal stationary properties at 1 percent level of significance.

S. N.	Variables	DF	ADF	PP
1	TR	-0.23	-1.23	-0.80
2	ΔTR	-4.07**	-3.80**	-3.97**
3	lnPOP	6.84*	-0.44	3.24**
4	ΔlnPOP	-0.25	1.03	0.10
5	ln pcRGDP	-4.22**	-3.02	-4.23**
6	∆ln pcRGDP	-9.19*	-6.65*	-10.54*
7	tt ₁	-3.29***	-3.60**	-3.27***
8	Δtt_1	-6.04*	-4.28*	-6.05*
9	tt ₂	-1.57	-1.54	-1.65
10	Δtt_2	-5.77*	-5.10*	-5.77*
11	TT	-2.97	-3.87**	-3.03
12	ΔΤΤ	-4.81*	-4.37*	-4.71*
13	NTT	0.91	0.31	0.68
14	ΔNTT	-4.32*	-3.44**	-4.32*

Table 7.5: Results of the DF, ADF and PP Tests with Trend and Intercept

Source: Author's calculation based on Appendix XV

	Significance of Unit R	loot Test with Trend	and Intercept	
		DF and PP		ADF
Critical Value at	Level	1st Diff.	Level	1st Diff.
* 1% level	-4.24	-4.25	-4.25	-4.26
** 5% level	-3.54	-3.55	-3.55	-3.55
*** 10% level	-3.20	-3.20	-3.20	-3.21

7.2.4 Effects on Tax Revenue

The estimation results of the of tax revenue model are presented in Table 7.6. Two regressions have been estimated using two measures of openness: regression (1) uses tt_1 , i.e., import taxes as percentage of total import as index of openness, whereas regression (2) uses tt_2 , i.e., total trade as percentage of GDP as another index of openness. In regression 1, all variables are found to be significant at 1 percent critical value. This model follows Phillips-Hansen Fully Modified OLS method in order to make valid inferences of the estimation process using more than two time series variables in the model.¹⁸

¹⁸ Razzaque *et al.*(2003) indicated that the simple OLS technique and testing for stationarity of residuals may be enough to verify the long-run relationship with two variables, however it is more important to determine the individual significance level of variables if there are more than two variables.

i. Tax Revenue in the Pre-Liberalization Period

As hypothesized, in the pre-liberalization, the tax revenue as percentage of GDP has been changed with the change in per capita real GDP and size of the population as shown in table 7.6. It is shown from the regression 1 that one of the index of openness tt₁ is positively correlated with the tax revenue as percentage of GDP, i.e., restrictiveness has led to a decline in the TR: a drop of one percentage point in the effective rate of trade taxation results in a drop of 0.17 percentage points in the TR. Likewise, the TR increases with the increase in per capita GDP and size of the population. In regression 2 also it is examined that another index of openness tt₂ is also positively correlated with the ratio of tax revenue to GDP, i.e., restrictiveness has led to a decline in the TR: a drop of one percentage point in the effective rate of trade taxation results in a drop of 0.01 percentage point in the TR. The coefficient of the population size was statistically significant, and its' sign indicates that TR is found to be increased as population size is increased.

Since TR is considered as an ~ I(1) variable, a valid co integrating relationship in a regression of TR on ln pcRGDP, ln pop and tt₁ can be established if the residuals from the estimated relationship appears to be stationary. The residuals from the estimated relationship were tested for stationarity to check co-integration among the variables. The ADF test statistic of RTR1F are computed at - 3.77 and -3.14 in regressions which are not found to be significant with their corresponding critical value.

Table 7.6: PHFMOLS Estimates of the Tax Revenue Model in the Pre-Liberalization Period

Regression 1				
Dependent Variable: TR				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	50.74	13.95	3.64	0.01
LNPOP	6.00	0.95	6.30	0.01
LNPCRGDP	6.70	1.72	-3.90	0.01
TT ₁	0.17	0.05	3.51	0.01
R-squared	0.77	Adjusted R-	squared	0.72
ADF Test Statistic for Residual RT	TR1F -3.77	Prob (F-st	atistic)	0.01

Regression 2				
Dependent Variable: TR				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	53.09	15.01	3.54	0.01
LNPOP	6.22	1.02	6.08	0.01
LNPCRGDP	6.89	1.84	-3.75	0.01
TT ₂	0.01	0.00	3.24	0.01
R-squared	0.76	Adjusted R-s	squared	0.70
ADF Test Statistic for Residual RT	R2F -3.14	Prob(F-statis	tic)	0.01

Notes: Dependent variable (TR) is the tax revenue as percentage of GDP. Independent variables are: In pop: natural logarithm of population size; In pcRGDP: natural logarithm of real per capita GDP (2000-01=100); tt₁ (open): index of openness 1 (import taxes as percentage of import)); tt₂ (open): index of openness 2 (trade as percentage of of GDP).

Source: Author's calculation based on Appendix XV

The short-run error-correction equations corresponding to the long-run models showing effects of trade liberalization on tax revenue are given in table 7.7. The results followed the 'general-to-specific' approach where the first lags of the first differenced variables along with the lagged dependent variable are also initially inserted into the models. The results show that in regression 1 the impact of the first openness variable i.e., tt₁, lnpcrGDP and the first lag of residuals on tax revenue have been observed with their significant critical values at 1 percen. However, in regression 2 of the same table shows that there are no impacts of all independent variables, except the residuals of the model i.e., RTR2F, on tax revenue in the short run due to their insignificant t-statistics.

Table 7.7: Estimated Short-run Models corresponding to the Long	g-run
Equations of the Tax Revenue Model in the Pre-Liberalization Pe	riod

Dependent Variable: Δ(TR)					
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.	
С	0.02	0.13	0.17	0.87	
Δ(TR(-1))	0.66	0.11	5.86	0.01	
Δ(LNPOP)	4.90	4.30	1.14	0.28	
Δ(LNPCRGDP)	-7.16	0.90	-7.99	0.01	
$\Delta(TT_1)$	0.21	0.03	6.09	0.01	
RTR1F(-1)	-2.00	0.23	-8.63	0.01	
R-squared	0.94	Adjusted R-squa	ared 0.90	_	
Heteroscedasticity	2.86	Prob(F-statistic)	0.01		
Serial Correlation	1.11	Functional Form	n 0.01		
Normality	1.33				

р ·	-1
Regression	

Regression 2							
Dependent Variable: Δ(TR)							
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	0.22	0.28	0.78	0.46			
Δ(TR(-1))	0.73	0.27	2.75	0.02			
Δ(LNPOP)	-3.01	8.97	-0.34	0.74			
Δ(LNPCRGDP)	-3.48	1.58	-2.20	0.06			
$\Delta(TT_2)$	-0.05	0.10	-0.56	0.59			
RTR2F(-1)	-1.56	0.56	-2.80	0.02			
R-squared	0.70	Adjusted R-squared	0.54				
Heteroscedasticity	0.84	Prob(F-statistic)	0.03				
Serial Correlation	0.88	Functional Form	1.65				
Normality	1.09						

Note: The serial correlation test is based on Godfrey's (1978) LM test for serial correlation; Functional Form on Ramsey's (1969) RESET test; Heteroscedasticity on White's (1980) test; and Normality of residuals on Jarque-Bera (1987) test. The computed test statistics for serial correlation, functional form and heteroscedasticity follow a chi-square distribution with one degree of freedom, while normality test statistic follows a chi-square distribution with 2 degrees of freedom.

Source: Author's calculation based on Appendix XV

The short-run model can explain 90 percent and 54 percent variation respectively in the dependent variable as indicated by the adjusted R^2 . The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem, normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figures 7.2 to 7.5



Figure 7.2: Sample Autocorrelation Function: RTR1F

In the figure 7.2, the short run autocorrelation function of the residuals of the first regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 2 lag (-0.50) while it is highest on 4 lag (0.41). Likewise, in the figure 7.3 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1980 and highest in 1977.





In the figure 7.4, the short run autocorrelation function of the residuals of the second regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 6 lag (-0.22) while it is highest on 1 lag (0.22).



Likewise, in the figure 7.5 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1976 and highest in 1981.



Figure 7.5: Long-run Relationship: RTR2F

ii. Tax Revenue in the Post-Liberalization Period

The effects of trade liberalization in the post-liberalization, however, appear to be surprising. In the post-liberalization period, the impact of all the independent variable i.e. lnpop, lnpcrgdp, and on the tax revenue in the first regression presented in the table 7.8 has not been found significant due to their insignificant t-values. But, the results of the regression 2 of the same table shows that all independent variables such as lnpop, lnpcrGDP, and tt₂ have positive impacts on TR which are found to be significant at 1 and 5 percent critical values respectively.

Table 7.8: PHFMOLS Estimates of the Tax Revenue Model in the Post liberalization Period

Regression I				
Dependent Variable: TR				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	52.14	46.09	1.13	0.27
LNPOP	25.26	7.74	3.27	0.01
LNPCRGDP	-12.91	7.12	-1.81	0.09
TT ₁	0.60	0.38	1.56	0.14
R-squared	0.78	Adjusted R-sq	uared	0.73
DF Test Statistic for Residual RTR1S	-2.45	Prob (F-statist	ic)	0.01

Regression 2				
Dependent Variable: TR				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	79.26	44.55	1.78	0.09
LNPOP	28.14	7.22	3.90	0.01
LNPCRGDP	-16.77	6.88	-2.44	0.03
TT ₂	0.19	0.08	2.45	0.03
R-squared	0.81	Adjusted R-squ	ared	0.78
ADF Test Statistic for Residual R	TR2S -1.89	Prob (F-statistic)	0.01

Source: Author's calculation based on Appendix XV

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The ADF test statistic of RTR1S and RTR2S are computed at 2.45 and -1.89 in the first and second regressions which are not found to be significant with their corresponding critical values. This indicates that there exists valid co-integration in the both regressions.

In the short-run error-correction equation presented in Table 7.9 corresponding to the long-run models of 7.8 have also shown mixed results indicating the impact of the independent variables i.e. Inpop and InpcrGDP have not found to be in place while the main openness variables such as tt₁ and tt₂ have positive impacts with their significant critical values within 5 percent. Likewise, the impacts of the lag of both residuals RTR1S and RTR2S on TR have also found as their respective t-statistics are found to be significant in both regressions within 5 percent critical values.

Regression 1						
Dependent Variable: Δ(TR)						
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.	
С	1.58	0.95		1.67	0.12	
Δ(TR(-1))	0.27	0.25		1.09	0.30	
Δ(LNPOP)	-50.62	37.75	-	1.34	0.20	
Δ(LNPCRGDP)	-9.36	5.53	-	1.69	0.11	
$\Delta(TT_1)$	0.51	0.22		2.39	0.03	
RTR1S(-1)	-0.41	0.19	-2	2.17	0.05	
R-squared	0.46	Adjusted R	-squared		0.25	
Heteroscedasticity	0.84	Prob(F-stat	istic)		0.12	
Serial Correlation	1.11	Functional	Functional Form		1.23	
Normality	0.69					

Table 7.9: Estimated Short-run Models corresponding to the Long-r	un
Equations of the Tax Revenue Model in the Post-liberalization Perio	bd

Regression 2						
Dependent Variable: Δ(TR)						
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.	
С	-0.48	1.15		-0.42	0.68	
Δ(TR(-1))	0.62	0.27		2.28	0.04	
Δ(LNPOP)	30.61	46.28		0.66	0.52	
Δ(LNPCRGDP)	-6.89	5.65		-1.22	0.24	
$\Delta(TT_2)$	0.15	0.06		2.43	0.03	
RTR2S(-1)	-0.59	0.24		-2.43	0.03	
R-squared	0.4	7 Adjus	ted R-squared		0.27	
Heteroscedasticity	0.7	3 Prob(I	F-statistic)		0.10	
Serial Correlation	0.3	9 Funct	ional Form		0.41	
Normality	0.5	2				

Source: Author's calculation based on Appendix XV

The short-run model can explain only 25 percent 27 percent variation respectively in the dependent variable as indicated by the adjusted R². The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem, normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figures 7.6 to 7.9.



Figure 7.6: Sample Autocorrelation Function: RTR1S

The figure 7.6 examines the short run autocorrelation function of the residuals of the first regression for the post-liberalization period. The figure reveals that the autocorrelation of residuals are found to have declines throughout the lags being the highest on 1 lag (-0.60) while it is lowest on 6 lags (0.41). Likewise, in the figure 7.7 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 2001 and highest in 2010.





In the figure 7.8, the short run autocorrelation function of the residuals of the second regression for the post-liberalization period has been examined. The figure reveals that the autocorrelation of residuals are also found to have declined throughout the lags being the highest on 1 lag (-0.51) while it is lowest in 6 lag (0.31).



Figure 7.8: Sample Autocorrelation Function: RTR2S

Likewise, in the figure 7.9 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 2001 and highest in 2010.





7.2.5 Effects on Trade Tax Revenue

i. **Trade Tax Revenue in the Pre-Liberalization Period**

The estimation results of the trade-tax revenue models in the pre-liberalization period are reported in table 7.10. The regressions have been estimated considering two different indexes of trade openness. In the first regression of Table 7.10, it is found that the first openness index i.e., tt_1 and its square tt_1^2 given in the equation are found to have impacts on TT having their significant critical values at 1 percent. This indicates that trade tax revenue as percentage of GDP seems to be changed with the change in these variables. However, the regression has not shown the impact of InpcrGDP on the trade tax revenue due to its insignificant t-value. But in regression 2, all independent variables i.e. InpcrGDP, tt_2 and its square tt_2^2 have not shown the impact on the trade tax revenue due to their insignificant t-values.

Table 7.10: PHFMOLS Estimates of the Trade Tax Revenue Model in the Pre-**Liberalization Period**

Regression 1				
Dependent Variable: TT				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-6.17	4.40	-1.40	0.18
LNPCRGDP	0.31	0.47	0.66	0.52
TT ₁	0.77	0.17	4.40	0.01
TT_1^2	-0.02	0.01	-3.98	0.01
R-squared	0.76	Adjusted R-se	quared	0.71
ADF Test Statistic for Residual F	RTT1F -2.89	Prob(F-statist	tic)	0.01

Regression 2				
Dependent Variable: TT				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-12.45	13.40	-0.93	0.37
LNPCRGDP	1.14	1.09	1.05	0.31
TT ₂	0.38	0.47	0.81	0.43
TT_2^2	-0.01	0.01	-0.72	0.48
R-squared	0.30	Adjusted R-squ	ared	0.14
ADF Test Statistic for Residual R	ATT2F -2.55	Prob(F-statistic)		0.19

Notes: Dependent variable is the percentage of trade tax revenues to GDP. Independent variables are: lnpcRGDP: natural logarithm of real per capita GDP (2000-01 = 100); tt_1 (open): index of openness1 (import taxes (% of import)); tt₂ (open): index of openness2 (trade (% of GDP)).

Source: Author's calculation based on Appendix XV

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The ADF test statistic of RTT1F and RTT2F are computed at 2.89 and -2.55 in the first and second regressions which are not found to be significant with their corresponding critical values. This indicates that there exists valid co-integration in the both regressions.

The short-run error-correction equations for the first index of openness (tt₁) corresponding to the trade tax revenue model are given in table 7.11 where the impact of some independent variables i.e. the first difference of tt₁, tt₁² and the lag of RTT1F are found to have positive with their significant critical values. But in the second regression of the same table, the regression results do not show the impact of all independent variables on the trade tax revenue due to their insignificant t-values. However, the regression 2 has shown the impact of the lag of RTT2F on the trade tax revenue.

Table 7.11: Estimated Short-run Models corresponding to the Long-runEquations of the Trade Tax Revenue Model in the Pre-Liberalization PeriodRegression 1

Regression 1						
Dependent Variable: A						
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	-0.02	0.05	-0.42	0.68		
Δ(TT(-1))	0.22	0.20	1.11	0.29		
Δ(LNPCRGDP)	0.71	1.24	0.57	0.58		
$\Delta(TT_1)$	0.71	0.22	3.26	0.01		
$\Delta(\mathrm{TT_1}^2)$	-0.02	0.01	-2.91	0.02		
RTT1F(-1)	-1.20	0.37	-3.24	0.01		
R-squared	0	.74 Adjusted R-s	squared	0.60		
Heteroscedasticity	17.40 Prob (F-stat		istic)	0.02		
Serial Correlation	1	.26 Functional F	orm	0.01		
Normality	1	.34				

Regression 2						
Dependent Variable: Δ(
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.	
С	-0.05	0.06		-0.76	0.47	
Δ(TT(-1))	0.29	0.23		1.27	0.24	
Δ(LNPCRGDP)	2.42	1.33		1.82	0.10	
$\Delta(TT_2)$	0.75	0.46		1.63	0.14	
$\Delta(\mathrm{TT}_2^2)$	-0.02	0.01		-1.46	0.18	
RTT2F(-1)	-0.49	0.25		-1.94	0.08	
R-squared	0.62	Adjuste	d R-squared		0.40	
Heteroscedasticity	3.26	Prob (I	F-statistic)		0.08	
Serial Correlation	0.01	Functio	nal Form		0.01	
Normality	0.98					

Source: Author's calculation based on Appendix XV

The short-run model can explain only 60 percent and 40 percent variation respectively in the dependent variable as indicated by the adjusted R^2 . The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem, normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figure 7.10 to 7.13.



Figure 7.10: Sample Autocorrelation Function: RTT1F

In the figure 7.10, the short run autocorrelation function of the residuals of the first regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 3 lag (-0.45) while it is highest on 6 lag (0.25). Likewise, in the figure 7.11 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1978 and highest in 1981.



Figure 7.11: Long-run Relationship: RTT1F

The figure 7.12 presents the short run autocorrelation function of the residuals of the second regression for the post-liberalization period. The figure reveals that the autocorrelation of residuals are found to have declined and ultimately increased. The lag resides the lowest on 5 lag (-0.59) while it is highest on 1 lag (0.59).



Figure 7.12: Sample Autocorrelation Function: RTT2F

Likewise, in the figure 7.13 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1984 and highest in 1981.



Figure 7.13: Long-run Relationship: RTT2F

ii. Trade Tax Revenue in the Post-Liberalization Period

Similarly, the estimation results of the trade-tax revenue model in the postliberalization period are reported in table 7.12. The regression has been estimated considering two different indexes of trade openness.

In table 7.12, it is found that the regression 1 has not shown the impact all independent variables i.e. lnpcrGDP, tt_1 and tt_1^2 on the trade tax revenue due to their corresponding insignificant t-values. The same result is observed in regression 2 except for the independent variable tt_2 , which is found to be significant at 10 percent critical value.

Regression 1						
Dependent Variable: TT						
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.	
С	-9.27	8.75		-1.06	0.31	
LNPCRGDP	0.47	0.44		1.05	0.31	
TT ₁	1.63	1.84		0.89	0.39	
TT_1^2	-0.09	0.11		-0.77	0.45	
R-squared		0.25 A	Adjusted R-squared		0.11	
ADF Test Statistic for R	esidual RTT1S	-3.67 P	rob (F-statistic)		0.19	

 Table 7.12: PHFMOLS Estimates of the Trade Tax Revenue Model in the Post

 liberalization Period

Regression 2					
Dependent Variable: TT					
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.
С	-8.59	6.04		-1.42	0.17
LNPCRGDP	-0.23	0.36		-0.64	0.53
TT ₂	0.69	0.37		1.86	0.08
$\mathrm{TT_2}^2$	-0.01	0.01		-1.70	0.11
R-squared	(0.51 Adjusted	R-squared	0.41	
ADF Test Statistic for Resid	ual RTT2S	3.29 Prob (F-	statistic)	0.01	

Source: Author's calculation based on Appendix XV

The ADF test statistic of RTT1S and RTT2S are computed at -3.67 and -3.29 in the first and second regressions which are not found to be significant with their corresponding critical values. This indicates that there exists valid co-integration in the both regressions.

In the short-run error-correction equations corresponding to the long-run models also has produced the surprising results indicating the impact of all the independent variables with their first difference lags on the tax revenue in equations 1 on the table 7.13 has not been found due to their corresponding insignificant t-values except for the first lag of RTT1S, which is found to be significant in 1 percent critical value. In regression 2 also the same result is observed except for the lag of the first difference of tt₂ and its square tt₂² which are found to be significant at 10 percent critical values and the lag of RTT1S that is found to be significant at 1 percent of critical value.

Regression 1					
Dependent Variable: Δ	(TT)				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.	
С	0.03	0.06	0.55	0.59	
Δ(TT(-1))	0.23	0.22	1.07	0.30	
Δ(LNPCRGDP)	-0.28	1.61	-0.17	0.86	
$\Delta(TT_1)$	0.48	1.11	0.43	0.67	
$\Delta(\mathrm{TT_1}^2)$	-0.02	0.07	-0.30	0.77	
RTT1S(-1)	-0.68	0.22	-3.12	0.01	
R-squared	0	.52 Adjusted	R-squared	0.34	
Heteroscedasticity	0	.53 Prob (F-s	statistic)	0.06	
Serial Correlation	0	.40 Function	al Form	3.87	
Normality	0	.18			

Table 7.13: Estimated Short-run Models corresponding to the Long-runEquations of the Trade Tax Revenue Model in the Post-liberalization Period

Regression 2						
Dependent Variable: Δ	Dependent Variable: Δ(TT)					
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	0.03	0.05	0.58	0.57		
Δ(TT(-1))	0.44	0.19	2.39	0.03		
Δ(LNPCRGDP)	-1.89	1.39	-1.35	0.20		
$\Delta(TT_2)$	0.51	0.25	2.03	0.06		
$\Delta(\mathrm{TT}_2^2)$	-0.01	0.00	-1.85	0.09		
RTT2S(-1)	-0.90	0.23	-3.94	0.01		
R-squared	0	.67 Adjuste	d R-squared	0.54		
Heteroscedasticity	0	.56 Prob (I	F-statistic)	0.01		
Serial Correlation	0	.42 Functio	onal Form	0.95		
Normality	0	.76				

Source: Author's calculation based on Appendix XV

The short-run model can explain 34 percent and 54 percent variation respectively in the dependent variable as indicated by the adjusted R^2 . The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem, normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figure 7.14 to 7.17.



Figure 7.14: Sample Autocorrelation Function: RTT1S

In the figure 7.14, the short run autocorrelation function of the residuals of the first regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 5 lag (-0.29) while it is highest on 1 lag

(0.42). Likewise, in the figure 7.15 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1992 and highest in 1995.



Figure 7.15: Long-run Relationship: RTT1S

In the figure 7.16, the short run autocorrelation function of the residuals of the second regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 3 and 4 lags (-0.41) while it is highest on 1 lag (0.30).



Figure 7.16: Sample Autocorrelation Function: RTT2S

Likewise, in the figure 7.17 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 2006 and highest in 1995.



Figure 7.17: Long-run Relationship: RTT2S

7.2.6 Effects on Non-trade Tax Revenue

i. Non-Trade Tax Revenue in the Pre-Liberalization Period

The estimation results for the effect of trade liberalization on non-trade tax revenues in the pre-liberalization period are reported in table 7.14. The results suggest that the first openness variable (tt₁) and natural log of per capita real GDP (lnpcrGDP) are not found to be supportive to increase the non-trade tax or domestic revenue for the country due to their corresponding insignificant critical values. Instead, the independent variable VAT as percentage of GDP has found to have an impact on nontrade tax revenue, which is found to be significant at 1 percent critical value. That means non-trade tax revenue increases with the increment of VAT and the taxes that were replaced by VAT prior to 1997. This result is expected in the sense that some alternatives tax revenue in the total trade tax revenue from the domestic sources have emerged following the implementation of trade liberalization in the country.

Likewise, in the second regression also, the impact of all independent variables except VATTOGDP, have not been found as indicated by their corresponding insignificant t-statistics. But, as expected, the independent variable VAT as percentage of GDP has found to have an impact on no-trade tax revenue, which is found to be significant at 1 percent critical value.

Table 7.14: PHFMOLS Estimates of the Non-Trade Tax Revenue Model in the **Pre-Liberalization Period**

Regression 1						
Dependent Variable: NTT						
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	0.20	6.71	0.03	0.98		
LNPCRGDP	0.23	0.73	0.32	0.76		
TT ₁	-0.05	0.03	-1.58	0.14		
VATTOGDP	1.23	0.14	8.56	0.01		
R-squared	0.85	Adjusted	R-squared	0.82		
ADF Test Statistic for Residual RNT	T1F -3.98	Prob (F	-statistic)	0.01		

Regression 2							
Dependent Variable: NTT							
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	9.97	7.21	1.38	0.19			
LNPCRGDP	-0.96	0.80	-1.20	0.25			
TT ₂	0.07	0.04	1.70	0.11			
VATTOGDP	0.91	0.23	4.00	0.01			
R-squared	0.86	Adjusted I	R-squared	0.82			
ADF Test Statistic for Residual RN	TT2F -3.31	Prob (F	-statistic)	0.01			

Note: Dependent variable is the ratio of non-trade tax revenues to GDP. Independent variables are: VATTOGDP as percentage of GDP, pcRGDP: natural logarithm of real per capita GDP (2000-01= 100); tt₁ (open): the first index of openness (import taxes as percentage of import)); and tt₂ (open): index of openness (trade as percentage of GDP).

Source: Author's calculation based on Appendix XV

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The ADF test statistic of RNTT1F and RNTT2F are computed at -3.98 and -3.31 in the first and second regressions which are not found to be significant with their corresponding critical values. This indicates that there exists valid co-integration in the both regressions.

In the short-run error-correction equation corresponding to the long-run models also has shown the results indicating the impact of all the independent variables with their first difference lags on the tax revenue in equations 1 on the table 7.15 have not been found due to their cop responding insignificant t-values except for the short run change in VATTOGDP and first lag of RNTT1S, which is found to be significant in 1 and 5 percent critical values respectively. The same result is observed in regression 2 also i.e., the impact of all independent variables with their first lags on the tax revenue have not been found due to their corresponding insignificant t-values except for the short run change in VATTOGDP and first lag of RNTT2S, which are found to be significant in 1 and 5 percent critical values respectively.

Regression 1							
Dependent Variable: Δ	Dependent Variable: Δ(NTT)						
Independent Variable	Coefficient	Std. E	Error	t-Statistic		Prob.	
С	0.02		0.07		0.24	0.82	
Δ(NTT(-1))	0.19		0.15		1.22	0.25	
Δ(LNPCRGDP)	-0.98		1.22		-0.80	0.44	
$\Delta(TT_1)$	-0.01		0.04		-0.37	0.72	
Δ(VATTOGDP)	1.28		0.34		3.75	0.01	
RNTT1F(-1)	-0.84		0.34		-2.42	0.04	
R-squared		0.84	Adjusted R	-squared	0.75		
Heteroscedasticity		2.44	Prob (F-stat	istic)	0.01		
Serial Correlation		1.90	Functional	Form	0.19		
Normality		2.49					

Table 7.15: Estimated Short-run Models corresponding to the Long-run
Equations of the Non Trade Tax Revenue Model in the Pre-Liberalization Period
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Regression 2						
Dependent Variable: Δ(NTT)						
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	0.03	0.07	0.48	0.64		
Δ(NTT(-1))	0.11	0.15	0.70	0.50		
Δ(LNPCRGDP)	-1.29	0.91	-1.42	0.19		
$\Delta(TT_2)$	0.00	0.04	-0.08	0.94		
Δ(VATTOGDP)	1.18	0.39	3.05	0.01		
RNTT2F(-1)	-0.83	0.33	-2.55	0.03		
R-squared	0.85	Adjuste	d R-squared 0.76	_		
Heteroscedasticity	0.92	Prob (F	F-statistic) 0.01			
Serial Correlation	4.48	Functio	onal Form 0.12	_		
Normality	0.38			_		

Source: Author's calculation based on Appendix XV

The short-run model can explain only 75 percent and 76 percent variation respectively in the dependent variables of both regressions as indicated by the adjusted R^2 . The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem,

normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figure 7.18 to 7.21.



Figure 7.18: Sample Autocorrelation Function: RNTT1F

In the figure 7.18, the short run autocorrelation function of the residuals of the first regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 2 lag (-0.50) while it is highest on 4 lag (0.41). Likewise, in the figure 7.19 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1980 and highest in 1977.





In the figure 7.20, the short run autocorrelation function of the residuals of the second regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 2 lag (-0.21) while it is highest in 1 lag (0.12).



Figure 7.20: Sample Autocorrelation Function: RNTT2F

Likewise, in the figure 7.21 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1976 and highest in 1981.



Figure 7.21: Long-run Relationship: RNTT2F

iii. Non-Trade Tax Revenue in the Post-Liberalization Period

The estimation results for the effect of trade liberalization on non-trade tax revenues in the post-liberalization period are reported in table 7.16. The results suggest that the first openness variable (tt₁) and natural log of per capita real GDP (lnpcrGDP) are not found to be supportive to increase the non-trade tax revenue for the country due to their coppresponding insignificant critical values. Instead, the independent variable VAT as percentage of GDP has found to have an impact on non-trade tax revenue, which is found to be significant at 1 percent critical value. That means non-trade tax revenue increases with respect to VAT and the taxes that were replaced by VAT prior to 1997. This result is expected in the sense that some alternatives tax revenue in the total trade tax revenue from the domestic sources have emerged following the implementation of trade liberalization in the country.

Likewise, in the second regression also, the impact of all independent variables except VATTOGDP, have not been found as indicated by their insignificant t-statistics. But, as expected, the independent variable VAT as percentage of GDP has found to have an impact on no-trade tax revenue, which is found to be significant at 1 percent critical value.

 Table 7.16: PHFMOLS Estimates of the Non-Trade Tax Revenue Model in the

 Post-liberalization Period

Regression I				
Dependent Variable: NTT				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-41.53	13.44	-3.09	0.01
LNPCRGDP	3.98	1.39	2.88	0.01
TT ₁	0.26	0.24	1.05	0.31
VATTOGDP	2.21	0.37	6.00	0.01
R-squared	0.89	Adjusted	l R-squared	0.87
ADF Test Statistic for Residual RN	TT1S -2.61	Prob (F-	statistic)	0.01

Regression 2								
Dependent Variable: NTT								
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.				
С	-36.72	13.21	-2.78	0.01				
LNPCRGDP	3.74	1.41	2.65	0.02				
TT ₂	0.00	0.05	-0.03	0.98				
VATTOGDP	2.11	0.37	5.73	0.01				
R-squared	0.89	Adjusted R-s	squared	0.87				
ADF Test Statistic for Residual RNT	T2S -2.27	Prob (F-statist	tic)	0.01				

Source: Author's calculation based on Appendix XV

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The ADF test statistic of RNTT1F and RNTT2F are computed at -2.61 and -2.27 respectively in the first and the second regressions which are not found to be significant with their corresponding critical value. This indicates that there exists a valid co-integration in the both regressions.

In the short-run error-correction equations corresponding to the long-run models also have shown the results indicating the impact of all the independent variables with their first difference lags on the tax revenue in equations 1 on the table 7.16 have not been found due to their insignificant t-values except for the short run change in VATTOGDP and first lag of RNTT1S, which is found to be significant in 10 and 5 percent critical values respectively. In regression 2 also the same result is observed i.e., the impact of all independent variables with their first lags on the tax revenue have not been found due to their insignificant t-values except for the short run change in VATTOGDP and first lag of RNTT2S, which are found to be significant in 10 and 5 percent critical values respectively.

Table 7.17: Estimated Short-run Models corresponding to the Long-run

Regression I								
Dependent Variable: Δ								
Independent Variable	Coefficient	Std. Error	t-Statistic		Prob.			
С	0.21	0.15		1.37	0.19			
Δ(NTT (-1))	0.17	0.23		0.73	0.48			
Δ (LNPCRGDP)	-2.22	3.61		-0.62	0.55			
$\Delta(\mathbf{TT}_1)$	0.25	0.16		1.61	0.13			
Δ (VATTOGDP)	0.86	0.43		1.99	0.07			
RNTT1S(-1)	-0.46	0.20		-2.31	0.04			
R-squared	0.45	Adjus	sted R-squared	0.24				
Heteroscedasticity	2.91	Prob	(F-statistic)	0.13				
Serial Correlation	1.77	Fune	ctional Form	0.02				
Normality	1.74							

Equations of the Non Trade Tax Revenue Model in the Post-liberalization Period

Regression 2

Dependent Variable: Δ				
Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	0.16	0.15	1.12	0.28
Δ(NTT(-1))	0.28	0.22	1.29	0.22
Δ(LNPCRGDP)	-2.15	3.47	-0.62	0.55
$\Delta(\mathrm{TT}_2)$	0.05	0.04	1.27	0.23
Δ(VATTOGDP)	0.75	0.42	1.78	0.10
RNTT2S(-1)	-0.42	0.18	-2.31	0.04
R-squared	0.48	Adjusted R-squa	ured 0.28	
Heteroscedasticity	1.63	Prob (F-statistic)) 0.10	
Serial Correlation	0.27	Functional Form	0.89	
Normality	0.20			

Source: Author's calculation based on Appendix XV

The short-run model can explain only 24 percent and 28 percent variation respectively in the dependent variable as indicated by the adjusted R^2 . The computed diagnostic test statistics suggest that the null hypotheses is rejected with no problem of serial correlation, no wrong functional form problem, normality of residuals and homoscedastic distribution errors. The corresponding short-run relationship of RTR1F and RTR3F is shown in Figure 7.22 to 7.25.





In the figure 7.22, the short run autocorrelation function of the residuals of the first regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 5 lag (-0.59) while it is highest on 1 lag

(0.58). Likewise, in the figure 7.23 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 1992 and highest in 1995.





In the figure 7.24, the short run autocorrelation function of the residuals of the second regression for the pre-liberalization period has been examined. The figure reveals that the lowest autocorrelation resides on 3 lag (-0.61) while it is highest on 1 lag (0.42).



Figure 7.24: Sample Autocorrelation Function: RNTT2S

Likewise, in the figure 7.25 the long run autocorrelation function of the residuals for the same period has been examined. The figure reveals that the autocorrelation of residuals are found to have oscillated throughout the period where it seems lowest in 2006 and highest in 1995.



Figure 7.25: Long-run Relationship: RNTT2S

7.2.7 Parameter Stability Test

The Chow Test as a parameter stability of regression model while analyzing impact of tariff liberalization is employed to observe the structural change in the relationship between the regressand Y and the regressors. By structural change, the values of the parameters of the model do not remain the same through the entire time period (Gujarati, 2003). Here, the structural change is primarily taken to the policy changes; however, other variables like external forces, action taken by the government, or to a variety of other causes have different degrees of impacts.

7.2.7.1 Estimation Results

As preceding segments has analyzed the relationships among the dependent and independent variables on different aspects of the impacts caused by the trade liberalization during both periods of 1974-75 to 1990-91 i.e. pre-liberalization and of 1991-92 to 2010-11 i. e., the post-liberalization periods. As these analysis found to have a mixed relationships among the variables analyzed above, this segment has run the Chow test to examine the parameter stability of regression models. As the Chow test studies the structural change in the relationships between the following dependent

and independent variables, an assessment has thus been done here to examine whether there is a structural change in the following due to the change in macroeconomic policy of the government that took place in 1990-91by introducing economic liberalization.

Table 7.18: Regression Results of various Dependent Variables Regressed with tt_1 by First (1974-75 to 1990-91), Second (1991-92 to 2010-11), and Whole (1974-

Dependent	Period	Constant	ß	\mathbf{R}^2	RSS	F-statistic	n	Chow F _{2,32}	F _{17,15}
TR	First	5.64*	0.07	0.06	7.54	0.91	17	7.14*	4.54*
		(5.43)	(0.95)						
	Second	15.05*	-0.74	0.10	38.83	1.81	19		
		(3.35)	-(1.34)						
	Whole	11.57*	-0.35*	0.35	67.08	18.43*	36		
		(13.02)	-(4.29)						
TT	First	1.32*	0.08*	0.45	0.68	12.44*	17	14.26*	1.36
		(4.23)	(3.53)						
	Second	1.34***	0.17***	0.17	1.06	3.50***	19		
		(1.80)	(1.87)						
	Whole	2.76*	0.12	0.03	3.30	0.96	36		
		(14.02)	-(0.98)						
NTT	First	4.31*	-0.01	0.01	4.86	0.02	17	5.66*	5.97*
		(5.17)	-(0.14)						
	Second	13.71*	-0.91***	0.16	32.93	3.22***	19		
		(3.31)	-(1.79)				-		
	Whole	8.81*	-0.34*	0.39	51.17	21.78*	36		
	··· nore	(11.35)	-(4.67)	0.022	01117	211/0	20		
InTOTALTRADE	First	10.35*	0.01	0.01	1.71	0.09	17	30.85*	0.59
	1 1150	(20.95)	(0.30)	0101		0.07	11	20102	0.07
	Second	13 57*	-0 20**	0.22	1 13	4 72**	19		
	beeona	(17.69)	-(2.17)	0.22	1.15	1.72	17		
	Whole	13 43*	-0.21*	0.61	8 31	52.44*	36		
	··· noie	(42.93)	-(7.24)	0.01	0.01	52.11	50		
InIMPORT	First	9.98*	0.02	0.01	2 39	0.14	17	24 56*	0 49
	1 1150	(17.07)	(0.38)	0.01	2.37	0.11	17	21.00	0.15
	Second	13 62*	-0 25**	0.26	1 34	5 83**	19		
	beeona	(16.33)	-(2.41)	0.20	1.5 1	5.05	17		
	Whole	13 13*	-0.21*	0.58	9 44	46 34*	36		
	··· noie	(39.39)	-(6.81)	0.50	2.11	10.51	50		
InEXPORT	First	9.05*	0.01	0.01	1.08	0.03	17	35 48*	1.07
	1 1150	(23.03)	(0.18)	0.01	1.00	0.05	17	35.10	1.07
	Second	11 19*	-0.08	0.04	1 31	0.65	19		
	beeona	(13,53)	-(0.81)	0.01	1.51	0.05	17		
	Whole	12 02*	-0.05*	0.62	7 71	54 92*	36		
	whole	(39.89)	-(7.41)	0.02	/./1	54.72	50		
lnRGDP	First	11 86*	0.02	0.03	0.72	0.47	17	20.67*	1 25
	1 1130	(36.95)	(0.68)	0.05	0.72	0.47	17	20.07	1.25
	Second	1/1 51*	_0 10**	0.22	1.02	<u>1</u> 71**	10		
	Second	(10.06)	_(2.19)	0.22	1.02	7./4	19		
	Whole	12 82*	-(2.10)	0.54	3 08	30 31*	36		
	WHOle	(63.02)	(6.27)	0.54	5.90	37.31	50		
1		(03.92)	-(0.27)						

75 to 2010-11) Period

Figures in parenthesis represent t values significant at *1, **5, and ***10 percent. *Source: Author's Calculation from Appendix XIV and XV*

The analysis presented in table 7.18 has explained that the error variances between the pre- and post-liberalization periods of TR and NTT with respect to tt_1 are found to be equal or significant. Therefore, the model has not allowed to run the Chow Test.

The hypothesis (iii) or parameter stabilities of the remaining dependent variables are found to be significant at 1 percent level of significance. In other words, there are structural changes between the pre- and post-liberalization periods of all dependent variables except TR and NTT. This indicates that the impact of the first openness variable tt_1 on trade tax as percentage of GDP has been found positive. However, the impact on natural log of total trade, import, export, and per capita real GDP have been found negetive.

Table7.19: Regression Results of various Dependent Variables Regressed with tt₂ by First (1974-75 to 1990-91), Second (1991-92 to 2010-11), and Whole (1974-75 to 2010-11) Period

Dependent	Period	Constant	b	\mathbb{R}^2	RSS	F-statistic	n	Chow F _{2,32}	F _{17,15}
TR	First	2.19**	0.21*	0.63	2.95	25.65*	17	0.17	12.19*
		(2.49)	(5.06)						
	Second	4.38	0.13	0.05	40.77	0.91	19		
		(0.90)	(0.95)						
	Whole	3.33*	0.16*	0.57	44.18	45.61*	36		
		(4.75)	(6.75)						
TT	First	1.33**	0.05**	0.24	0.95	4.73**	17	3.04***	0.69
		(2.66)	(2.18)						
	Second	0.44	0.06*	0.41	0.75	11.96*	19		
		(0.66)	(3.46)						
	Whole	1.88*	0.05*	0.40	2.02	22.91*	36		
		(12.55)	(4.79)						
NTT	First	0.86	0.16*	0.59	1.99	21.76*	17	0.28	17.14*
		(1.18)	(4.66)						
	Second	3.94	0.06	0.01	38.61	0.25	19		
		(0.83)	(0.50)						
	Whole	1.45**	0.13*	0.51	41.32	35.09*	36		
		(2.13)	(5.92)						

Figures in parenthesis represent t values significant at *1, **5, and ***10 percent. *Source: Author's Calculation from Appendix XIV and XV*

The analysis presented in table 7.19 has also explained that the error variances between the pre- and post-liberalization periods of TR and NTT with respect to tt_2 are found to be equal or significant. Therefore, the model has not allowed to run the Chow Test.

The hypothesis (iii) or parameter stability of the remaining dependent variable TT has been found to be significant at 10 percent level of significance. In other words, there is structural change between the pre- and post-liberalization periods. This indicates that the impact of the second openness variable tt_2 on trade tax as percentage of GDP has been found positive.

7.3 Against the Trade Liberalization

Advocates against trade liberalization are also of the view that WTO's NAMA negotiations, which refer to scale down the tariff rate, will not lead the economy to a pro-development outcome. According to them, developed countries are demanding excessive opening to imports which, if agreed, could destroy local businesses and jobs in developing countries without bringing compensating economic gains. Poor-country governments will face balance of payments problems, loss of tax revenue, and downward pressure on workers conditions and rights, and their future industrial development prospects will be undermined (Third World Network, 2005). Trade tax reduction has, therefore, the following impact for developing and least developed countries.

- (i) High and variable tariffs have always been a key tool in industrial policy and successful development for the developing and least developed countries. History demonstrates that almost all successful countries have built up their industries through some form of selective sheltering of domestic producers. Protection of infant industries enables domestic companies to get established and to acquire the scale, knowledge, and technology to compete with already established international competitors.
- (ii) Tariffs have become even more important, as other tools of industrial policy have become constrained by the WTO and other agreements. Orthodox free-trade economists often argue that while tariffs have been used in the past, they are no longer an appropriate instrument in

today's globalised world. But for the majority of developing countries, the opposite is true. Since the 1980s, industrial tariffs have become more important for developing countries, as the availability and scope of other measures previously used to promote domestic industries have diminished.

- (iii) Premature tariff liberalization can have disastrous effects on development. Real-life experiences from developing countries that have liberalized under structural adjustment programs (SAPs) and regional trade agreements show that results are mixed at best. Developing countries have faced a wide variety of problems, such as increased economic instability, trade deficits, loss of employment and de-industrialization, worsening employment conditions (in export processing zones, often accompanied by violations of fundamental workers' rights), and widening inequalities of income.
- (iv) The potential gains for developing countries in the NAMA agreement, in terms of market access to developed country markets, may not materialize. In addition to the clear risks to developing countries of adopting the current NAMA proposal, their potential gains from NAMA in terms of market access to industrialized countries are questionable. Although, taking into account preferential rates, developing countries face on average a tariff of only 3.9 per cent on industrial goods exported to developed countries, they face tariff peaks and tariff escalation on their key export products. These issues are included in the Doha talks.
- (v) Given their current direction, NAMA negotiations will have a negative impact on the development prospects of developing countries. Although there is still widespread disagreement among WTO members about the tariff reduction formula, the extent of tariff binding coverage, the treatment of unbound tariffs, flexibilities for developing countries, and how to address preference erosion, developing countries are right to be alarmed about the direction in which negotiations are heading.

In macroeconomic standpoint, reduction in trade tax brings about fiscal instability to the developing and least developed countries. As many developing

countries chose to dismantle their trade barriers and open their economies to international competition, transition to liberalized trade with reduced trade tax incur substantial short-run costs for developing governments, especially in terms of a decline in tax revenues. To the extent that public spending is targeted at useful programs (e.g., schools, infrastructure, health), the transition to free trade initially may result in a significant loss for a poor nation (Younas and Subhayu Bandyopadhyay 2009).

In the long run, if liberalization is successful, these problems would be expected to be addressed both by provision of better private markets and rising revenues from different sources (income and sales taxes or possibly trade taxes owing to the volume effect) as a result of rising national income levels. However, even in the case of potentially successful liberalization, the donors may be concerned about the short-run budgetary implications of trade liberalization for the poorest of nations (ibid).

In principle, even in the short run, revenue losses from trade liberalization may be offset by turning to less-distortionary alternative sources of revenue. This approach requires good governance and an efficient domestic tax system; however, the evidence for this alternative is somewhat disheartening. For example, Baunsgaard and Keen (2005) argue that middle- and low-income countries fail to achieve substantial tax reforms to replace the lost trade revenue by revenue from other sources. They find that middle-income countries recovered 45 to 60 cents from other sources for every one-dollar loss in trade tax revenue, whereas low-income countries could recover no more than 30 cents for each lost dollar. Khattry and Rao (2002) find that in lowincome countries revenue constraints remain even after a decade of trade reforms, and they emphasize the need for a fiscally realistic development strategy in the postliberalization period. In a broader analysis of the limitations of trade policy reform in developing countries, Rodrik (1992) argues that tariff reduction at the cost of fiscal considerations can have disastrous consequences. The study cites the examples of Turkey and Morocco, where trade taxes were reimposed because of fiscal problems.

7.4 Major Findings

The impact of trade liberalization and its revenue consequences in Nepalese economy has given an unexpected result to some extent, while taking it into some of the theoretical references of tariff liberalization as:

- i. Both indexes of trade openness variables i.e. tt_1 and tt_2 , indicate that Nepal has become more open in the post-liberalization period than that of the pre-liberalization period as the of average percentage trade tax as percentage of import is found to have 15.55 in the pre-liberalization period and 10.08 the post-liberalization period. Likewise, the average percentage trade as percentage of GDP is found to have 21.48 in the pre-liberalization period and 36.10 the post-liberalization periods.
- ii. The impact of trade openness variables i.e. tt_1 and tt_2 is found to have a positive on tax revenue in the pre-liberalization both in short and long run period except the impact of tt_2 in short run of the pre-liberalization periods.
- iii. But the impact of tt_1 in the long run of the post-liberalization period has not been found, while it has a valid impact in short run. On the contrary, the impact of tt_2 on TR has been found both in short and long run of the post-liberalization.
- iv. Likewise the study found the impact of tt_1 and its square tt_1^2 to trade tax revenue in both the long and short run of the pre-liberalization period. But the impact of another index of trade openness tt_2 and its square tt_2^2 cannot be found in both the long and short run in the pre-liberalization period.
- v. But the impact of trade openness variables i.e. tt_1 and tt_2 to the trade tax revenue has not been found in both the short and long run of the post-liberalization periods, while the impact of tt_2 in the same period has been found mixed. The impact of tt_2 on trade tax revenue has not been found in the short run while it has an impact in the short run in the post-liberalization period.
- vi. The impact of tt_1 and tt_2 to non-trade tax revenue has not been found both in the pre- and post-liberalization periods in both short and long run period, while the impact of VAT as percentage of GDP on the non-

trade tax revenues in both long and short run of both the pre- and postliberalization periods has been found.

- vii. The impact of other independent variables such as population, per capita real GDP and VAT to the tax revenue, trade tax revenue, and non-trade tax revenue in most of the cases are not observed, both in the pre- and post-liberalization periods except population and per capita real GDP have positive impact on tax revenue in the pre-liberalization period.
- viii. While calculating elasticity coefficients of trade tax revenues with respect to trade revenue index is found to be lesser (2.07) in the post-liberalization period than that of the pre-liberalization period (2.31).
- ix. Regarding the stability parameter check, the Chow test shows that there a significant impact of structural change i.e. policy variable change in the 1990-91 to all the tax revenue, trade tax revenue and non-trade tax revenue, total trade, import, export, and GDP.

CHAPTER VIII

SUMMARY, CONCLUSION, AND POLICY IMPLICATIONS

8.1 Summary

This segment has summed up the major ideas, which are explained and analyzed in all the chapters in this study.

8.1.1 Introduction

Over the last six decades or so, most of the economies in the world have experienced a remarkable progress in lowering tariffs. This regime has drawn a greater attention over time along with the inception of trade reforms as many developing and least developed countries liberalized their economies in recent decades and the interests are further accelerated with the implementation WTO in these countries. Following this paradigm of opening up the economies, developing and the least developed countries have also taken initiatives towards extensive and rapid trade liberalization. Trade liberalization has come into a comprehensive regime along with the establishment of the WTO which called a wide academic debate, is whether trade liberalization or the WTO regime brings about positive impacts on developing countries' trade.

Trade liberalization and the introduction of WTO have invited two serious implications for developing countries and low income countries like Nepal. First, however, as tariffs have declined, the importance of non-tariff barriers like SPS as TBT has introduced. Developing and the least developed countries can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages only when the products are able to meet the stringent quality standard – the SPS measures – in developed countries' markets. As this quality compliance of exportable commodities involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength. On the other hand, these countries have, prima facie, to face revenue loss due to reduced tariffs regime. This becomes very important policy issue as many developing and low income countries government revenue are hugely supported by import duties.

Amidst, the debates on the trade liberalization and its impacts on the least developed countries' economies, this study has analyzed the cost of quality compliances to Nepalese export on the one hand, and revenue impact – especially the trade tax revenue impact of trade liberalization in the import front. This research has taken tea industry as a case study to analyze the SPS compliance costs in WTO regime as the export potential appears highest for these products. Likewise, considering that many developing and least developed countries like Nepal rely heavily on trade tax revenue, and a reduction or elimination of these taxes may be a source of their fiscal instability, this study has analyzed trade tax revenue impact on the Nepalese economy.

8.1.2. Methods of Analysis

This study has measured the costs of quality compliance analyzing a special reference to Nepalese Orthodox Tea as case study among exportable commodities within the SPS framework. Likewise, it has also tried to measure the trade revenue impact on the Nepalese economy. To analyze the cost of SPS compliance of highland orthodox tea, the OLS regression is applied to estimate the individual cluster of cost components of the ISO 22000 rule. Before assessing the simple regression estimations, this study has attempted to test the reliability of data since they are drawn from the primary source through Cronbach's Alpha reliability test. In addition to some simple regression estimations and other statistical analysis, this study has attempted to assess some perceptual analysis based on the reactions and information drawn from the respondent of sampled tea estates.

To measure the revenue impact due to trade liberalization, this study has followed the multivariant regression to measure the trade tax revenue within the tariff liberalization framework. For this, a comparable set of data for the period 1974-75 to 2008-09 has been used. To check the stationarity properties of the variables, DF, ADF and PP tests for unit roots have been employed. After employing the unit root test, econometric analysis was carried out following Phillips-Hensen Fully Modified OLS model to test for valid long and short run relationships between the variables with error correction muddling. This study also applied the Chow Test to examine the parameter stability of the regression models.

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8.1.3 WTO and Developing Countries

The underlying idea and the conceptual origin of the rule-based multilateral trading regime go back to World War II, with the establishment of ITO. The ITO was to be a United Nations specialized agency, but the ITO treaty was not approved. Instead GATT was established and went into effect in 1948. Over the years, the GATT ensured liberalization of world trade through the elimination or reduction of tariffs and other barriers to merchandise trade. It was responsible for the manifold expansion of international trade. During more than four decades of post war period, the GATT has sponsored eight rounds of trade-policy negotiations. The latest round of negotiations, which was completed in 1994, resulted in the creation of the WTO. The WTO includes the text of GATT, but it also goes further and embodies a set of agreements that build on and extend GATT principles to new areas. The central role played in the world economy by GATT/WTO is widely accepted. WTO, established in the last and largest GATT round of negotiations, promotes and enforces the provisions of trade laws and regulations. Whereas GATT had dealt mainly with trade in goods, the WTO and its agreements cover trade in goods and services, traded inventions, creations, and designs (intellectual property), dispute settlement mechanism as well as trade policy review mechanism.

The WTO, which is regarded as the third economic pillar of the world economy, has imparted a debate for the developing and the LDC on the opportunities and challenges it has brought about. Some are of the opinion that economic openness in the WTO regime provides better access to trade potentials for the developing and low income countries and hence promotes their growth outcome as countries perform better with outward orientation than with import substitution policy. They see openness to trade helps countries utilize their resources better in several ways. On the other side, there are also a number of advocates who take a more skeptical view of the evidence on the relationship between openness and trade growth. According to tem, developing and low income countries, in WTO framework, have to face revenue loss due to reduced tariffs regime, which brings about an important implication as the government these countries' revenue have hugely been supported by custom duties. Likewise, as tariffs have declined, the importance of non-tariff barriers has increased. Such measures impose a huge cost in order to meet these compliance conformities on these countries.

8.1.4 Trade Regime and Performance of Nepalese Economy

Nepal's entrance into the economic liberalization and recently into the WTO regime has been induced by the quest of macroeconomic stability and growth. For this, Nepal started reforms in the policies since 1985-86 following outward oriented liberal development strategies. As an integral part of the economic liberalization, Nepal also became the member of the WTO, which has been taken an opportunity for the stabilization and growth the economy. But opposite of the expectation, the share of export in total trade after the WTO membership has been decreased with widening trade deficit. Moreover, even in the pre-liberalization period when Nepalese economy was characterized by inward-looking and state-led development strategies with policy measures of the protection to domestic industries, import substitution, state-led industrialization, and government monopolies in major industries, trade performance was not favorable for Nepal due to import heavyweight compared to its export.

Nepal's trade after the liberalization of the economy has been impacted by two major implications viz. quality compliance conformities for export items and revenue impact on import part. This study has analyzed the SPS compliance cost for highland orthodox tea as its export potential appears highest for tea in terms of employment generation, revenue collection, and socioeconomic sustenance. The tea processing industry is seen as a potential growth industry and an important channel for reducing poverty due to strong linkages to rural communities. It also serves as an illustration of the issues facing commercial and estate farming. Large areas of Nepal are suitable for tea plantations, and global demand for niche teas, such as orthodox tea, continues to grow. Export quantities are small. As the Nepal industry is relatively young, the quality of tea trees is regarded as high, compared to those in India leading many to consider tea to be a potentially important export.

Although, tea products to developed country markets have emerged as a potentially major source of export growth for many developing countries in the recent rears, exploiting this potential poses many challenges. The capacity of Nepalese tea producers and exporters to enter the developed countries' markets is constrained by the stringent food safety standards imposed by these markets. Not only are these standards stringent, but they are increasingly so. They now go well beyond traditional quality standards, as producers and exporters of orthodox tea must pay closer attention to the responsible use of agrochemicals, energy, water and wastes, as well as social and environmental impacts. These standards are significantly higher than those prevailing in conventional production and trading practices. They are subject to frequent changes and are, ultimately, often difficult and costly to meet.

On the revenue aspect of trade liberalization, the assessment of the revenue inmacts requires generally various indicators. Considering the nature and availability of the data, this study has explained the implication of Nepalese trade liberalization policy to the revenue performances comparing the changes of various indicators between the pre and the post-liberalization periods. For this, some popular indicators to measure the direction and impact of trade liberalization has been presented. These measures include the comparative averages of percentages between pre and the postliberalization periods like trade revenue index, trade revenue as percentage of GDP, trade as percentage of GDP, trade tax revenue as percentage of imports and trade tax as percentage of total trade.

8.1.5 Impact of WTO Regime on the Economy

A generalized view over economic liberalization in WTO framework imparts both opportunities and challenges for an economy. The country in such economic regime can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages, but at the same time, the products should able to meet the stringent quality standard – for example, the SPS measures – in developed countries' markets. On the other hand, these countries also have to face revenue impact from import due to reduced tariffs regime, as agreed in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries government revenue are hugely supported by import duties. Therefore, a country has to bear the dual costs of compliance and achieve rapid economic growth – both in export and import – to be benefitted from the WTO and economic liberalization.

With the world-wide reduction in tariffs under the auspices of the GATT/WTO standards, non-tariff measures (NTMs) have gained importance in world

trade. This trend also reflects the growing concerns over product quality and consumer health and safety. As this quality compliance of exportable commodities, within the SPS framework, involves significant costs, the burden of cost of compliance is entirely on the exporters despite the fact that their capacity for the compliance is limited. The main characteristics of the SPS agreement and the related measures applied by main importing countries are such that they require a complex, difficult and high cost SPS system. Such a system involves regulatory measures, policy re-orientation, and development of the necessary infrastructure, re-organization of the supply chain, enhanced capacity building and a forward looking strategy, particularly for exports. The preparation for the compliance is also difficult for the poor countries as it is knowledge intensive, requires a learning period, training and a close cooperation between the public and private sector in various stages of the supply chain. Yet the socio-economic cost of the lack of compliance is enormous.

Likewise, while dealing with the impact of trade liberalization on custom revenues front, many studies suggest that developing and the least developed countries have to face revenue loss from import trade liberalization regime, because of the agreements in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries governments' revenue is hugely supported by custom duties. The impact of tariff cuts on a particular country is largely an empirical issue, as it depends inter alia on the initial trade value and tariff level; the size and mode of the tariff cut; and import demand and supply elasticity. Moreover, beyond the reduction in tariffs, the liberalization of the trade regime can involve a variety of measures, some of which would be revenue neutral or even serve to raise revenue (Ebrill, 1999). In particular, a conversion of NTB such as quotas, bans, and import licenses into tariffs would generate additional revenue, and administrative reforms could entail efficiency gains in customs administration. In the context of the neo-liberal model, which predicates long term gains from trade and investment liberalization through the growth of GDP, there is no question that, even if there are some negative fiscal impacts in the short term, liberalization would compensate and, lead eventually, to larger fiscal revenue derived from growth of economic activity that serves as base for taxation.

8.1.6 Analysis of Data and Results

To analyze the comparative cost function of Nepalese highland orthodox tea with respect to the output, the OLS regression is applied to estimate the individual cluster of cost components of the ISO 22000 rule to explain the relationship between natural log of conventional quality cost (lnCQ_c) and natural log of output (lnOUTPUT). From this, the cost of SPS compliance is found to be significant having the coefficient of the natural log of lnOUTPUT is found to have 0.42. For the conventional set up or fixed quality cost analysis with respect to output this study is also found substantial. The coefficient of the natural log of lnOUTPUT is found to have 0.29. Likewise, the relationship between conventional ongoing or variable cost with respect to output is also notable. The coefficient of the natural log of lnOUTPUT is found to have 0.37. Regarding SPS compliance cost analysis with respect to output, this study has presented the significant relationship between the natural log of SPS quality cost (lnSPSCQ_c) and natural log of output (lnOUTPUT). The coefficient of the natural log of lnOUTPUT is found to have 0.31. Similarly, for SPS compliance fixed or set-up cost analysis with respect to output is also found to be significant. The coefficient of the natural log of InOUTPUT is found to have 0.19. Finally, SPS compliance ongoing or variable cost analysis with respect to output is also found very high. The coefficient of the natural log of InOUTPUT is found substantial with 0.64.

While comparing the average cost structure of the sampled tea estates, this study has obtained chronological cost increments with respect to their size. The study has examined a composite analysis of the percentage share of conventional and SPS quality costs of sampled tea estates. The small size tea estates have on average 63.07 percentage of conventional quality cost (50.09 percent set-up/fixed and 12.98 percent ongoing quality related costs) and 36.93 percent SPS quality cost (29.79 percent set-up/fixed and 7.14 percent ongoing quality related costs). The study thus shows overall 79.88 percentage set-up/fixed costs and 20.12 percentage of conventional quality cost (52.78 percent set-up/fixed and 15.22 percent ongoing quality related costs) and 32.00 percent SPS quality cost (25.65 percent set-up/fixed and 6.35 percent ongoing quality related costs). The examination shows overall 78.43 percentage set-up costs and 21.57 percentage ongoing/variable costs. Similarly, the large size tea

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estates have 69.94 percentage of conventional quality cost (42.92 percent set-up/fixed and 27.01 percent ongoing quality related costs) and 03.06 percent SPS quality cost (19.33 percent set-up/fixed and 10.74 percent ongoing quality related costs). The table shows overall 62.25 percentage set-up costs and 37.75 percentage ongoing/variable costs.

This study has also employed non parametric test to examine benefits and constraints of SPS quality compliance measures to the producers of sampled tea estates through Spearman's Rho correlation. This study has measured a significant correlation between perceived benefit and the cost, perceived difficulties and the size of firm (in terms of output).

On the other hand, this analysis has attempted to analyze impact of trade liberalization on various macroeconomic parameters. For this, this study has assessed first the determinants of different revenue components with the help of regression. This has been done by regressing the share of tax revenue in GDP on natural log of population size (pop), natural log of real per capita GDP (pcRGDP), and the index of openness (tt). This study, like other theoretical explanations, uses two indexes of openness: import taxes as percent of total import (tt₁) and total trade as percent of GDP (tt₂). The study has revealed that both indexes of trade openness variables indicate that Nepal has become more open in the post-liberalization period than that of the pre-liberalization period. The impact of trade openness variables i.e. tt₁ and tt₂ is found to have a positive impact on tax revenue in the pre-liberalization both in short and long run period. But the impact of trade openness variables i.e. tt₁ and tt₂ to the tax revenue has not been found in the post-liberalization periods both in short and long run period.

Likewise the study has examined that the impact of tt_1 and its square tt_1^2 to trade tax revenue in both the long and short run of the pre-liberalization period. But the impact of another index of trade openness tt_2 and its square tt_2^2 cannot be found in both pre and the post-liberalization period. But the impact of trade openness variables i.e. tt_1 and tt_2 to the trade tax revenue has not been found in the post-liberalization periods in both short and long run period as their corresponding t-value are found to be insignificant. The impact of tt_1 and tt_2 to non- trade tax revenue has not been found

in the pre-liberalization periods in both short and long run period as their corresponding t-value are found to be insignificant. Similarly, the impact of tt_1 and tt_2 to non- trade tax revenue has not been found in the pre-liberalization periods in both short and long run period as their corresponding t-value are found to be insignificant.

The impact of other independent variables such as population, per capita real GDP and VAT to the tax revenue, trade tax revenue, and non-trade tax revenue in most of the cases are observed insignificant both in pre and the post-liberalization periods except population and per capita real GDP have positive impact on tax revenue in the pre-liberalization period. However, while calculating elasticity coefficients of trade tax revenues with respect to trade revenue index is found to be more elastic in the post-liberalization period than that of the pre-liberalization period. Likewise, the coefficients of tax revenues and non-trade tax revenues with respect to trade revenue index are also found to be more elastic in the post-liberalization period than that of the pre-liberalization period.

Regarding the stability parameter check, the Chow test shows that there a significant impact of structural change i.e. policy variable change in the 1990-91 to all the tax revenue, trade tax revenue and non-trade tax revenue, total trade, import, export, and GDP. It is, therefore, the inferences can be drawn as per the Chow test that trade revenue as percentage of Import, Natural log of Real GDP, Total Trade as percentage of GDP, Natural Log of Real GDP, Natural Log of Population, Natural Log of Total Trade, Natural Log of Import and Natural Log of Export and independent variables tt_1 and give mixed results as there are structural changes among some variables, while structural change could not be found between some variable in first and second periods.

8.2 Conclusion

Developing and the least developed countries within the trade liberalization regime and multilateral trading framework of WTO have been implicated within an optionless alternative while dealing with their economic and business environment for growth and development : achieve economic growth facing tough challenges. This policy option has thus provided both the opportunities and challenges. First, the country can be benefitted from the favored access to the global markets with their products of comparative and competitive advantages only when the products are able to meet the stringent quality standard –the SPS measures – in developed countries' markets. As this quality compliance of exportable commodities involve significant costs, producers and exporters of these countries face severe difficulties due to their weak competitive strength. On the other hand, these countries also have to face revenue impact from import due to reduced tariffs regime, as agreed in non agricultural market access framework of WTO. This implication is very important because many developing and low income countries government revenue are hugely supported by import duties. Therefore, a country has to bear the dual costs of compliance and achieve rapid economic growth – both in export and import – to be benefitted from the WTO and economic liberalization.

While dealing with the implication of SPS measures to the exportable products of developing and LDCs, its implementation requires a complex, difficult and high cost system involving regulatory measures, policy re-orientation and enhanced capacity building. Such standards are not harmonized and sometimes change rapidly in emergency situations. They cause not only difficulties in preparation for the compliance, but they also impose extra costs on exporters and create uncertainty for them as well as for investors. Therefore it is highly costly and difficult for poor countries. Although the costs of compliance are related to both imports and exports, the burden of the cost is on the export side; with few exceptions, requirements for imports are the same as that of exports. As far as exports are concerned; the burden of the cost of compliance is imposed on the exporting countries; the cost of compliance is relatively high in relation to the income level of the least developed and other low income countries and resources available to them; while the cost of compliance is high, the short and long run cost of the lack of compliance is enormous, in terms of the loss of foreign exchange, income, employment and household consumption. From the analysis the following conclusions can be drawn in terms of the impact of SPS measures on Nepalese highland orthodox tea as:

i. A significant direct and positive relationship is found between the conventional quality cost and output, which is compatible with the neo-classical cost function between cost and output.

- ii. A significant direct and positive relationship is found between the conventional set-up/fixed cost and output.
- The relationship between conventional quality ongoing or variable cost with respect to output has also significant direct and positive relationship.
- A significant direct and positive relationship is also found between the SPS quality cost and output.
- v. The significant direct and positive relationship is found between the SPS quality set-up/fixed cost and output.
- vi. The relationship between SPS quality ongoing cost with respect to output has also significant direct and positive relationship.

Nevertheless, in order to expand exports, they have little choice than developing their capacity for the compliance irrespective of their membership of WTO. The question is how this can be done to reduce the cost of compliance and enhance its benefit.

On the other hand, when analyzing the revenue impact of trade liberalization, time series data and regression results presented in this study has revealed that average tariff rate (import duty as a percentage of total import) began to fall as trade reforms gained momentum, particularly from early 1990s. In fact, the aforesaid share came down from 14.40 percent during fiscal year 1974-75 - 1990-91 to 9.63 percent during 1991-92-2010-11. This testifies to the increasingly greater openness of the Nepalese economy, both through opening up of the domestic market to global markets and accessing of overseas markets through exports. The tax revenue as percentage of GDP in Nepal is positively correlated with openness for the trade liberalization period. But, the share of tax revenue to GDP is negatively correlated with the per capita real GDP and the population size of the country. As hypothesized, in the preliberalization, the tax revenue/GDP ratio increases with the increase in per capita real GDP and size of the population. It is examined that one of the index of openness tt_1 is positively correlated with the ratio of tax revenue to GDP, i.e., restrictiveness has led to a decline in the ratio of tax revenue to GDP. Likewise, the tax revenue/GDP ratio increases with the increase in per capita GDP and size of the population. It is examined that another index of openness tt₂ is also positively correlated with the ratio of tax revenue to GDP, i.e., restrictiveness has led to a decline in the ratio of tax revenue to GDP. But surprisingly, in the post-liberalization period, the impact of all

the independent variable i.e. population, real GDP trade openness index on trade tax revenue cannot be found significant. From the analysis, the following conclusions regarding the impacts of trade liberalization on the government's revenue can be drawn as:

- i. Both indexes of trade openness variables i.e. tt₁ and tt₂, indicate that Nepal has become more open in the post-liberalization period than that of the preliberalization period as the of average percentage trade tax as percentage of import is found to have 15.55 in the pre-liberalization period and 10.08 the post-liberalization period. Likewise, the average percentage trade as percentage of GDP is found to have 21.48 in the pre-liberalization period and 36.10 the post-liberalization period.
- ii. The impact of trade openness variables i.e. tt_1 and tt_2 is found to have a positive on tax revenue in the pre-liberalization both in short and long run period except the impact of tt₂ in short run of the pre-liberalization periods. But the impact of tt_1 in the long run of the post-liberalization period has not been found, while it has a valid impact in short run. On the contrary, the impact of tt2 on TR has been found both in short and long run of the postliberalization. Likewise the study found the impact of tt_1 and its square tt_1^2 to trade tax revenue in both the long and short run of the pre-liberalization period. But the impact of another index of trade openness tt_2 and its square tt_2^2 cannot be found in both the long and short run in the pre-liberalization period. But the impact of trade openness variables i.e. tt_1 and tt_2 to the trade tax revenue has not been found in both the short and long run of the postliberalization periods, while the impact of tt₂ in the same period has been found mixed. The impact of tt₂ on trade tax revenue has not been found in the short run while it has an impact in the short run in the post-liberalization period. The impact of tt₁ and tt₂ to non-trade tax revenue has not been found both in the pre- and post-liberalization periods in both short and long run period, while the impact of VAT as percentage of GDP on the non-trade tax revenues in both long and short run of both the pre- and post-liberalization periods has been found.
- iii. While calculating elasticity coefficients of trade tax revenues with respect to trade revenue index is found to be lesser in the post-liberalization period than that of the pre-liberalization period.
iv. The impact of other independent variables such as population, per capita real GDP and VAT to the tax revenue, trade tax revenue, and non-trade tax revenue, in most of the cases are not observed to have an impact both in pre and the post-liberalization periods. But population and per capita real GDP have positive impact on tax revenue in the pre-liberalization period.

8.3 Policy Implications

When liberalization is emerged as a functioning framework in the economy, it has very often attributed far reaching implications especially for the economies of developing and least developed countries in two crucially important external economic domains (in international trade), i. e., in exports and in imports. The following are some policy implications.

8.3.1 SPS Related Implications and Scope for Policy Intervention

The government and public sector institutions have the responsibility of promoting good agricultural practices. Technical and financial support could be sought to establish to demonstrate these management systems. Different publication regarding this subject could be developed to raise awareness of safety issues. The SPS Agreement encourages governments to participate actively in international standard setting bodies. This starts by the ratification of international treaties. Participation also implies that country delegations attend the meetings of these bodies. Participation however, is not only about meeting attendance but also about having the tools to participate fully in the negotiations. This requires first and foremost that before each negotiation and according to the agenda, sectoral studies are to be developed within the country to allow the formulation of a national position on specific issues. To implement all the components of a quality control system, there is a pressing need of training. This can be in the form of training courses abroad or inhouse courses. The key idea is that knowledge required to implement the system evolves quickly and demands continuous training. Another key aspect is the access to updated information. For private sector, it is necessary to invest in ensuring relevant information flows about market requirements. Producers should be regularly updated on the changes to the dynamic SPS standard which has direct impacts of their production practices.

In most cases, there is a strong need to upgrade infrastructure. The costs of upgrading and equipping the new infrastructure are high. For this, the formation of a co-ordinating body at national level is needed to co-ordinate and facilitates the private sector constraints and activities. It would also be responsible for ensuring the harmonization of food safety legislation and for setting up a rapid alert system to warn national authorities of potential food hazards. The following points, which are derived from the focus group discussion are inferred here as some policy implications.

- i. The ISO 22000 protocol requires a high investment and know-how. The first task was to adapt the ISO 22000 checklist to be relevant for the context and produce a manual for field procedures adapted to the production system.
- ii. The SPS standard is adapted relatively in lesser difficulty to large producers who have the human and financial resources to implement and monitor the system. An assistance package of SPS implementation to small producers is needed.
- iii. It is also possible to obtain a group certification for produce marketing organizations, which can be a co-operative or other group of growers that takes over responsibilities of SPS implementation for the associated and contracted growers through an internal control system. This possibility has led to the adoption of the protocol by small holders in highland tea industry.
- iv. One of the constraints to the adoption of the protocol identified during this study is the lack of knowledge about the protocol. It is, therefore, important to provide knowledge and information to producers and the public officials about the protocol.
- v. Another important constraint is the absence of local certification companies for SPS standard. Exporters and producers of orthodox tea have had to resort to foreign companies for certification. These are often expensive. One way to address this problem would be to stimulate the creation of local certification companies which can provide certification services to the farmers at moderate prices. Creating local technical assistance companies would also help the farmers reach compliance.
- vi. Developing country stakeholders need to participate actively in the SPS compliance to ensure that their particular conditions are taken into account in the development of the standard.

8.3.2 Revenue Related Implications and Scope for Policy Intervention

Fiscal management in Nepal has, to a large extent, been constrained by poor performance in terms of tax revenue mobilization. Nepal, with one of the lowest tax-GDP ratios (7.89 percent of GDP during 1974-75 to 2009-2010) in South Asia, needs to change the tax structure and strengthen tax management system. This is essential to raise revenue earnings at a time when trade liberalization is expected to be further deepened. With regard to tax structure, it is time to concentrate more on domestic taxes rather than trade taxes, and on direct taxes instead of indirect taxes, to stimulate higher revenue collection. Alternative sources of revenue ought to be explored to ease dependency on the customs duties particularly in view of the fact that customs duties have been adversely affected by trade related reforms. At the same time, reform in the tax administration ought to be done to improve the competence of Nepal's taxation system which consequently can develop revenue generation capacity of the country. The following points therefore are inferred as some policy implications.

- i. A continuing and effective effort by the revenue authority is required for identifying potential alternative avenues to compensate for the revenue losses arising from trade liberalization.
- ii. Although time series data reveal a significant improvement in revenue earnings during the trade liberalization period in Nepal, the estimated regression results tend to suggest that trade liberalization do not have perceptible impact for overall tax revenue mobilization in the country. This could happen because of very low productivity in revenue collection.
- iii. Although the role of trade taxes in the total tax revenue has been decreasing since the beginning of trade liberalization, trade taxes still dominate the overall tax earnings of the country.
- iv. Since there is a possibility of falling trade taxes arising from further trade liberalization, the proportion of both the domestic taxes and direct taxes in total tax revenue calls for to increase the revenue base of the country.
- v. VAT has provided the major source of revenue compared to the taxes it replaced contributing one-third of the total tax revenue collection of the country. In this regard it needs to be broadened and made productive and buoyant.

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APPENDIX I

QUESTIONNAIRE TO CONDUCT A SURVEY TO MEASURE THE COST OF SPS QUALITY COMPLIANCE OF NEPALESE HIGHLAND ORTHODOX TEA

Purpose

This survey is design to collect information on the measurement of quality compliance cost of Nepalese highland orthodox tea products in the international market. This study is conducted as the fulfillment of the requirement for the Ph. D. program of Tribhuvan University in Economics. This study is supported by the University Grants Commission Nepal.

Confidentiality of Information Supplied

The information supplied will be used for the above purpose. No information from individual respondents will be made available to other parties.

Help and Advice

Mail	Email	Phone/Fax
Cost of SPS Quality Compliance survey		
(Attn: Surendra Kumar Uprety)		Phone: 01 1/100662
The Office of the Dean & Central	unnetrounen dra @amail.aam	1 Holie: 01-4499002, 4472002
Department of Economics	Department of Economics upretysurendra@gmail.com	4472902
Tribhuvan University		Mod: 98510-91166
Kirtipur		

Notes: The questionnaire should be filled out by a Quality Manager. It takes about 1 or 2 day(s) minutes to finish. It is OK if you do not have or choose not to supply some of the information. However, we appreciate if you would strictly follow the structure of the questionnaire and complete as many questions as possible.

- 1. What is the size of the plant in terms of output?
- Small
 Medium
 Large

 What is the legal organization of the business?
 Single proprietorship
 Partnership

 Government Corporation
 Corporation
 Corporative
- 3. Do you have ISO 22000:2005 certification? No Yes
- 4. What was the year of first application for quality standard (ISO 22000:2005 or others) certification?
- 5. What was the year of your first quality standard (ISO 22000:2005 or others) system acceptance or certification?
- 6. How many quality standard (ISO 22000:2005 or others) plans do you have? (*Question to be ask if the plant has multiple product lines*)
- 7. What benefits are you experiencing since you have implemented quality standard ISO 22000:2005 certification? Please ENCIRCLE the appropriate rating in terms of the relevance of the list of benefit categories in terms of actually realizing these benefits.

I=VERY HIG	H RELEV	ANCE 3 =	VERY L	OW RELI	EVANCE
Increased ability to retain existing customers	1	2	3	4	5
Reduced product microbial counts	1	2	3	4	5
Increased product sales	1	2	3	4	5
Increased ability to access new export markets	1	2	3	4	5
Increased ability to attract new customers	1	2	3	4	5
Reduced product wastage	1	2	3	4	5
Increased product shelf-life	1	2	3	4	5
Increased motivation of production staff	1	2	3	4	5
Increased motivation of supervisory staff	1	2	3	4	5
Increased product prices	1	2	3	4	5
Reduced production costs	1	2	3	4	5

- Did you experience or have you negotiated any INCREASE in PRICE since you implemented ISO 22000:2005 or other quality standard system Yes No
- 9. If yes to Question 21, what is the INCREASE in PRICE negotiated and received since you implemented ISO 22000:2005 or other quality standard system?
 1-10% 11-20% 21-30% 31-40%
- Did you experience any INCREASE in VOLUME OF PRODUCTION since your plant has implemented ISO 22000:2005 or other quality standard system? Yes No
- If yes to Question 25, what is the INCREASE in PRODUCTION since your plant implemented ISO 22000:2005 or other quality standard system?
 1-5% 6-10% 11-15% Others 20%
- 12. Did you experience any INCREASE in VOLUME OF SALES since your plant has implemented ISO 22000:2005 or other quality standard?
 Yes No
- 13. If yes to Question 29, what is the INCREASE in VOLUME OF SALES since your plant implemented ISO 22000:2005 or other quality standard system?

 1-15%
 16-30%
 31-45%
 Others
- 14. Does your plant have a record for costs associated with ISO 22000:2005 or other quality standard implementation?
 Yes No
- 15. If yes, approximately how much is the change in production costs due to ISO 22000:2005 (%). The next questions ask about ISO 22000:2005 or other quality standard implementation costs (one-time costs) and operating costs (recurring costs). Please specify the overall cost of set-up or ongoing ISO 22000:2005 or other quality standard cost in the following table.

			SET-UP	ONGOING
ISC	0 22000:2005 REQUIREMENTS	INPUTS	COST IN	COST IN
			THOUSAND	THOUSAND
1. Tı	aceability System			
a.	Establishment of a traceability			
	system that allows product to be			
	traced back to the registered farm			
	or identification product lots &	Stationery/forms		
	their relation to batches raw	Sign posting (label &		
	materials, processing & delivery	stickers)		
	records	Mapping Computers		
b.	Identify every incoming material	(hardware and		
	from the immediate suppers & the	software)		
	initial distribution route of the end	Building		
	product			
с.	Handling unsafe product & in the			
	event of product withdrawal.			
2. De	ocument & Record Keeping & Sel	f-Inspection		
a.	Keep up-to-date records for a	Develop record-		
	minimum of Three years	keeping sheets		
b.	Keep records that reference each	Hire personnel to		
	area covered by a crop with all	complete them		
	the agronomic activities	Build offices		

с.	Records of all fertilizer	Consultant services	
	applications	FSMS team	
d.	Records of irrigation/fertigation		
	water use.		
е	Record all crop protection product		
U.	applications		
f	Complete self-inspection and		
1.	document it (annually)		
a	Pacords of maintaining to provide		
g.	avidance of conformity to		
	requirements & evidence of the		
	operation of ESMS		
h	Documented procedure (Standard		
	Operating procedure) for Dec. &		
	records		
2 5:	A Managament		
<u></u>	Drenore soil more for the forming		
a.	and regular maintenance	Consultant services	
4 D			
4. KI	sk Assessments (revised annually))	
a.	rood safety, operator health and		
1	environment risk assessment		
b.	Potential risks for organic		
	fertilizer (disease transmission)		
c.	Risk assessment for irrigation		
	water		
d.	Hygiene risk analysis for harvest		
	and pre-farm gate transport	Technical services for	
	process	risk assessment –	
e.	Risk assessment of hygiene	outsourcing	
	aspects of the produce handling		
	operation.		
f.	Identify all possible waste		
	products produced		
g.	Risk assessment for working		
	conditions		
h.	Residual analysis		
1.	Quality Control assessment		
5. Te	chnical Services	T	
a.	Advice on quantity and type of		
	fertiliser: Use a trained technician		
	to determine quantity and type of		
	fertilizer to use		
b.	Use trained technician for choice		
	of pesticides		
c.	Use systematic methods to		
	calculate water requirement of the		
	crop		
d.	Use technician with recognized	Hire specialized staff	
	certificates or formal training to		
	advise/carry out post-harvest		
	treatments		
e.	Development of procedures for		
	water management, hygienic		
	product handling (physical,		
	chemical and microbiological		
	contaminants)		
f.	Waste and pollution action plan		

6. La	boratory Analysis		
(Lab	pratory should be accredited to ISO	17025 or equivalent	
stand	ard)		
a.	Annual pesticide residue testing		
b.	Check maximum levels for heavy		
	metals established by the Codex		
	Alimentarius		
c.	Check microbiological		
	contaminants criteria (CAC/GL		
	21–1997)	. .	
d.	Contents of $N \cdot P \cdot K$ of organic	Laboratory analysis	
	fertilizer		
e.	Analyse irrigation water at least		
	once a year to be done by a		
f	Carry out appual analysis of water		
1.	for post hervest weshing		
a	Soil analysis		
g. 7 So	il and Substrate Management		
1.30	Use cross line techniques on		
a.	slopes drains sowing grass or	Consultancy services	
	green fertilizers trees and hushes	Seeds and other	
	on borders of sites etc	materials	
8 Fe	rtilizer Use		
9. FC	Fertilizer application machinery		
h.	Carry out verification of		
0.	calibration by a specialized	Services of a	
	company every year	specialized company	
C	Fertilizer storage		
с.	Covered area free from waste		
	and does not constitute a breeding		
	place for rodents, dry.	Build storage	
	well ventilated and free from	Maintenance costs	
	rainwater or heavy condensation		
	at least 25 meters away from		
	direct water sources,		
9. Cı	op Protection		
a.	Implement IPM techniques	IPM training	
1		Acquire machinery and	
D.	Modern application equipment	sprayers	
	Annual maintanance sheets of	Services of a	
C.	Allitual maintenance check of	specialized	
	state of appreciation machinery	maintenance company	
d.	Pesticide storage and handling		
e.	Crop protection products storage		
	(Sound and robust, Secure,		
	Lockable, a source of clean water		
	no more than 10 metres distant		
	and eye washing facility		
	appropriate to the temperature	Build chemical store	
	conditions: built of materials or	Buy equipment	
	located so as to protect against		
	temperature extremes, Fire-		
	resistant, well lit, shelving made		
	or non-absorbent material,		
f	Dedicated vehicle for a set id.	nonout including	
1.	purchase	nsport incluaing venicle	
G	Chemical mixing area	Build area	
g.	Chemical mixing area	Бина игеа	

h.	Separate storage for empty containers	Build storage	
i.	Disposal of empty crop protection product containers in a safe manner	Build chemical disposal site	
j.	Application machinery with pressure-rinsing equipment for containers	Special machinery	
k.	Dispose of obsolete crop	Support national	
	protection products securely	programme to dispose	
10.	Irrigation/Fertigation	of obsolete products	
a.	Implement a water management		
	plan to optimize water use and reduce waste	Consultancy services	
11.	Harvesting & Pruning		
a.	Hygiene		
b.	Removed packed produce from field overnight	Build storage for produce Temporary holding shades Main holding shade withering	
с.	Packaging/harvesting containers or	n farm	
d.	Label in accordance with CODEX STAN 1–1985, Rev. 2–1999 plus: Produce variety and/or commercial type, Name and address of exporter, packer and/or dispatcher. Identification code, Country of origin	Costs of labeling	
12.	Produce Handling		
a.	Implement an hygiene procedure		
b.	Pruning and maintenance of garder	1	
c.	Where water is recirculated for final produce washing, it is filtered and disinfected, and routinely monitored	Water filtering system	
d.	On-farm facility for produce handling and/or storage	Packing house	
e.	Floors designed to allow and ensure drainage with slopes, drainage channels, light bulbs protected/shielded so as to prevent contamination of food in case of breakage	Build storage	
f.	Separate storage for waste material	Build storage	
13.	Waste & Pollution Management, F	Recycling and Re-Use	
a. h	waste and Pollution Action plan		
Ο.	wastage reduction, pollution and waste recycling	Consultancy services	
c.	Farms have designated areas to	Build waste disposal	
	store litter and waste	facilities	
d.	Treat waste water	Water treatment facilities	

14.	Worker Health, Safety and Welfar	'e	
a.	Training		
b.	Training workers operating dangerous or complex equipment, Train personnel handling pesticides, Train at least one person	Training courses	
	in first aid, Basic hygiene training for food handling by qualified people or consultant		
c.	Facilities, equipment and accident p preparedness	rocedures or emergency	
d.	Toilets and hand-washing equipment for harvest workers and production (receiving, rolling, fermentation, draying, sorting, testing & packaging)	Build toilets Build hand-washing facilities Build shower facilities Changing room Garments for workers	
e.	Medical equipment (packing house and cold store)	First aid kits	
f.	Fire equipment (packing house)	Fire extinguishers	
g.	Signs warning of potential dangers placed on access door panels with emergency preparedness' procedures	Signs	
h.	Separate storing for all protective clothing	Build storage	
i.	Acquire protective clothing (e.g. rubber boots, waterproof clothing, protective overalls, rubber gloves, face masks etc.)	Buy personal protective equipment	
j.	Welfare		
k.	Health checks on staff working with pesticides	Medical care	
1.	The living quarters on farm are habitable sound roof, windows and doors, and they have potable water, toilets and drains.	Build quarters for workers	
15.	Environmental Issues		
a.	Carry out a base line audit of the fauna and flora on farm	Environmental consultancy services	
b.	Develop a wildlife conservation	Environmental	
	statement.	consultancy services	
c.	Training farmers on environmental impacts of agricultural activities	Training course	
d.	Implement wildlife and	Costs of corrective	
	conservation measures	actions	
16.	Certification	<i>Certification</i> <i>assessment</i>	
a.	Certification costs	··· · · · ·	
17.	ISO 2200 Procedures PRP,	Hire specialized staff	
	UPRP, HACCP Plan, & other	and train in ISO	
1	relevant document required by the ISO 22000:2005	22000:2005 procedures	
а.	Adapt ISO 22000 checklist to local/	crop conditions	
b.	Training course for growers	*	

18.	External Communication		
a.	Suppliers & contactors	Resource material (computer, mobile and other accessories	
b.	Customer handling, complaint & feedback and establish resource	Resource requirement	
с.	Regulatory and Statutory authorities	National standards follow-up	
19.	Internal Communication		
	a. Impact on food safety management	Technical requirement	
	b. Production premises, location of equipment, surrounding environment	Resource requirement	
	c. Packaging, storage & distribution systems.	Resource requirement	

- 16. Which of the investments and costs in Question 36 WILL YOU STILL INCUR EVEN WITHOUT ISO 22000:2005 or other quality standard system?
- 17. What year did you make the capital investments for ISO 22000:2005 or other quality standard or other quality standard and what is the expected useful life?

Physical plant changes: ______year invested expected useful life ______ Equipments: year invested ______ expected useful life ______

- 18. Did you hire additional manpower to design the ISO 22000:2005 or other quality standard plan and implement the ISO 22000:2005 or other quality standard system?
 Yes No
- 19. Is yes, how many additional manpower did you hire?
- 20. Did you increase salary or other benefits per employee due to ISO 22000:2005 or other quality standard?

21. Did you re-organize the business due to ISO 22000:2005 or other quality standard implementation?

- 22. If yes to Question 67, please describe the changes.
- 23. What are the difficult aspects of ISO 22000:2005 or other quality standard that you experienced? Please ENCRICLE your perceived intensity of the difficulties that you have encountered (1 being of very high difficulty and 5 being of very low difficulty).

Internal budgetary constraint	1	2	3	4	5
Difficulties in obtaining external funding	1	2	3	4	5
Overwhelmed by things and changes to be done to	1	2	3	4	5
adopt ISO 22000:2005 or other quality standard system					
Reduced staff time available for other tasks	1	2	3	4	5
Training/motivation of production/supervisory staff	1	2	3	4	5
Difficulties of getting advise	1	2	3	4	5
Reliable raw material supplier	1	2	3	4	5
Current food safety controls are considered sufficient	1	2	3	4	5
Other investments are considered more important	1	2	3	4	5
Recouping costs of implementing ISO 22000:2005 or	1	2	3	4	5
other quality standard system					
Reduced flexibility to introduce new products	1	2	3	4	5
Reduced flexibility of production process	1	2	3	4	5
Reduced flexibility of production staff	1	2	3	4	5
Greater priority given to other issues and other	1	2	3	4	5
investments					
Uncertainty about potential benefits from ISO	1	2	3	4	5
22000:2005 or other quality standard system					
Perception that the current food safety control are	1	2	3	4	5
sufficient					

1=VERY HIGH DIFFICULTY 5=VERY LOW DIFFICULTY

24. In your opinion, what are the important factors that are constraining the Nepalese Tea industry from attaining a higher level of export growth? Please ENCIRCLE the relative importance of the following factors (1 being of very high importance and 5 being of very low importance), based on your perception.

			I LOW	In OK	mice
Supply conditions					
Cost and quality of tea inputs	1	2	3	4	5
Cost of processing	1	2	3	4	5
Transport	1	2	3	4	5
Credit/Capital	1	2	3	4	5
Cost of doing business	1	2	3	4	5
Demand conditions					
Overall product quality	1	2	3	4	5
Consistency of product quality	1	2	3	4	5
Compliance with food safety requirements	1	2	3	4	5
Compliance with environmental requirements	1	2	3	4	5
Value added	1	2	3	4	5
Industry structure					
Difficulties to entry and exit	1	2	3	4	5
Government					
Tariffs/quotas	1	2	3	4	5
Bureaucracy	1				
Government regulations	1				
Lack of government support	1				

1=VERY HIGH I	MPORTANCI	E 5=VERY L	.OW IMI	PORTANCE

25. In your opinion, what are the important food safety-related issues that are constraining the Nepalese tea industry from attaining a higher level of export growth? Please ENCIRCLE the relative importance of the following factors (1 being of very high importance and 5 being of very low importance)

Food industry's trust in the food safety regulatory body	1	2	3	4	5
Government's food safety regulatory systems	1	2	3	4	5
Cost of compliance	1	2	3	4	5
Traceability system	1	2	3	4	5
Monitoring and surveillance systems	1	2	3	4	5
Industry's current adoption of food safety systems	1	2	3	4	5
Culture of food safety among firms in the industry	1	2	3	4	5
Culture of product quality among firms in the industry	1	2	3	4	5

1=VERY HIGH RELEVANCE 5=VERY LOW RELEVANCE

26. In your opinion, what are the important food safety-related issues that are constraining the Nepalese Tea industry from attaining a higher level of export growth? Please ENCIRCLE the relative importance of the following factors (1 being of very high importance and 5 being of very low importance), based on your perception.

1-VENT HIGH INFORTANCE 5-VENT LOW INFORTANCE					
Administrative regulations; bureaucracy in the public sector	1	2	3	4	5
Trade policy	1	2	3	4	5
Export promotion policy	1	2	3	4	5
Macroeconomic policy	1	2	3	4	5
Food safety policy and regulation	1	2	3	4	5
Tax system's impact on investment and risk-taking	1	2	3	4	5
Investment in infrastructure	1	2	3	4	5
Labor policy	1	2	3	4	5

1=VERY HIGH IMPORTANCE 5=VERY LOW IMPORTANCE

- 27. In your opinion, what are the export strategies that the government should pursue to promote tea exports?
- 28. In your opinion, what programs and support from the government are needed by the processors and exporters in order to improve the profitability and viability of the Nepalese tea export industry?
- 29. Do you have any other comments you would like to make?

THANK YOU FOR YOUR TIME AND ASSISTANCE

APPENDIX II AGREEMENT ESTABLISHING THE WORLD TRADE ORGANIZATION

The Parties to this Agreement,

Recognizing that their relations in the field of trade and economic endeavor should be conducted with a view to raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development,

Recognizing further that there is need for positive efforts designed to ensure that developing countries, and especially the least developed among them, secure a share in the growth in international trade commensurate with the needs of their economic development,

Being desirous of contributing to these objectives by entering into reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international trade relations,

Resolved, therefore, to develop an integrated, more viable and durable multilateral trading system encompassing the General Agreement on Tariffs and Trade, the results of past trade liberalization efforts, and all of the results of the Uruguay Round of Multilateral Trade Negotiations,

Determined to preserve the basic principles and to further the objectives underlying this multilateral trading system,

Agree as follows:

Article I Establishment of the Organization

The World Trade Organization (hereinafter referred to as "the WTO") is hereby established.

Article II Scope of the WTO

- 1. The WTO shall provide the common institutional framework for the conduct of trade relations among its Members in matters related to the agreements and associated legal instruments included in the Annexes to this Agreement.
- 2. The agreements and associated legal instruments included in Annexes 1, 2 and 3 (hereinafter referred to as "Multilateral Trade Agreements") are integral parts of this Agreement, binding on all Members.
- 3. The agreements and associated legal instruments included in Annex 4 (hereinafter referred to as "Plurilateral Trade Agreements") are also part of this Agreement for those Members that have accepted them, and are binding on those Members. The Plurilateral Trade Agreements do not create either obligations or rights for Members that have not accepted them.
- 4. The General Agreement on Tariffs and Trade 1994 as specified in Annex 1A (hereinafter referred to as "GATT 1994") is legally distinct from the General

Agreement on Tariffs and Trade, dated 30 October 1947, annexed to the Final Act Adopted at the Conclusion of the Second Session of the Preparatory Committee of the United Nations Conference on Trade and Employment, as subsequently rectified, amended or modified (hereinafter referred to as "GATT 1947").

Article III Functions of the WTO

- 1. The WTO shall facilitate the implementation, administration and operation, and further the objectives, of this Agreement and of the Multilateral Trade Agreements, and shall also provide the framework for the implementation, administration and operation of the Plurilateral Trade Agreements.
- 2. The WTO shall provide the forum for negotiations among its Members concerning their multilateral trade relations in matters dealt with under the agreements in the Annexes to this Agreement. The WTO may also provide a forum for further negotiations among its Members concerning their multilateral trade relations, and a framework for the implementation of the results of such negotiations, as may be decided by the Ministerial Conference.
- 3. The WTO shall administer the Understanding on Rules and Procedures Governing the Settlement of Disputes (hereinafter referred to as the "Dispute Settlement Understanding" or "DSU") in Annex 2 to this Agreement.
- 4. The WTO shall administer the Trade Policy Review Mechanism (hereinafter referred to as the "TPRM") provided for in Annex 3 to this Agreement.
- 5. With a view to achieving greater coherence in global economic policy-making, the WTO shall cooperate, as appropriate, with the International Monetary Fund and with the International Bank for Reconstruction and Development and its affiliated agencies.

Article IV Structure of the WTO

- 1. There shall be a Ministerial Conference composed of representatives of all the Members, which shall meet at least once every two years. The Ministerial Conference shall carry out the functions of the WTO and take actions necessary to this effect. The Ministerial Conference shall have the authority to take decisions on all matters under any of the Multilateral Trade Agreements, if so requested by a Member, in accordance with the specific requirements for decision-making in this Agreement and in the relevant Multilateral Trade Agreement.
- 2. There shall be a General Council composed of representatives of all the Members, which shall meet as appropriate. In the intervals between meetings of the Ministerial Conference, its functions shall be conducted by the General Council. The General Council shall also carry out the functions assigned to it by this Agreement. The General Council shall establish its rules of procedure and approve the rules of procedure for the Committees provided for in paragraph 7.
- 3. The General Council shall convene as appropriate to discharge the responsibilities of the Dispute Settlement Body provided for in the Dispute Settlement Understanding. The Dispute Settlement Body may have its own chairman and shall establish such rules of procedure as it deems necessary for the fulfillment of those responsibilities.
- 4. The General Council shall convene as appropriate to discharge the responsibilities of the Trade Policy Review Body provided for in the TPRM. The Trade Policy Review Body may have its own chairman and shall establish such rules of procedure as it deems necessary for the fulfilment of those responsibilities.
- 5. There shall be a Council for Trade in Goods, a Council for Trade in Services and a Council for Trade-Related Aspects of Intellectual Property Rights (hereinafter referred to as the "Council for TRIPS"), which shall operate under the general

guidance of the General Council. The Council for Trade in Goods shall oversee the functioning of the Multilateral Trade Agreements in Annex 1A. The Council for Trade in Services shall oversee the functioning of the General Agreement on Trade in Services (hereinafter referred to as "GATS"). The Council for TRIPS shall oversee the functioning of the Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter referred to as the "Agreement on TRIPS"). These Councils shall carry out the functions assigned to them by their respective agreements and by the General Council. They shall establish their respective rules of procedure subject to the approval of the General Council. Membership in these Councils shall be open to representatives of all Members. These Councils shall meet as necessary to carry out their functions.

- 6. The Council for Trade in Goods, the Council for Trade in Services and the Council for TRIPS shall establish subsidiary bodies as required. These subsidiary bodies shall establish their respective rules of procedure subject to the approval of their respective Councils.
- 7. The Ministerial Conference shall establish a Committee on Trade and Development, a Committee on Balance-of-Payments Restrictions and a Committee on Budget, Finance and Administration, which shall carry out the functions assigned to them by this Agreement and by the Multilateral Trade Agreements, and any additional functions assigned to them by the General Council, and may establish such additional Committees with such functions as it may deem appropriate. As part of its functions, the Committee on Trade and Development shall periodically review the special provisions in the Multilateral Trade Agreements in favour of the least-developed country Members and report to the General Council for appropriate action. Membership in these Committees shall be open to representatives of all Members.
- 8. The bodies provided for under the Plurilateral Trade Agreements shall carry out the functions assigned to them under those Agreements and shall operate within the institutional framework of the WTO. These bodies shall keep the General Council informed of their activities on a regular basis.

Article V Relations with Other Organizations

- 1. The General Council shall make appropriate arrangements for effective cooperation with other intergovernmental organizations that have responsibilities related to those of the WTO.
- 2. The General Council may make appropriate arrangements for consultation and cooperation with non-governmental organizations concerned with matters related to those of the WTO.

Article VI The Secretariat

- 1. There shall be a Secretariat of the WTO (hereinafter referred to as "the Secretariat") headed by a Director-General.
- 2. The Ministerial Conference shall appoint the Director-General and adopt regulations setting out the powers, duties, conditions of service and term of office of the Director-General.
- 3. The Director-General shall appoint the members of the staff of the Secretariat and determine their duties and conditions of service in accordance with regulations adopted by the Ministerial Conference.
- 4. The responsibilities of the Director-General and of the staff of the Secretariat shall be exclusively international in character. In the discharge of their duties, the Director-General and the staff of the Secretariat shall not seek or accept instructions from any government or any other authority external to the WTO. They shall refrain from any

action which might adversely reflect on their position as international officials. The Members of the WTO shall respect the international character of the responsibilities of the Director-General and of the staff of the Secretariat and shall not seek to influence them in the discharge of their duties.

Article VII Budget and Contributions

- 1. The Director-General shall present to the Committee on Budget, Finance and Administration the annual budget estimate and financial statement of the WTO. The Committee on Budget, Finance and Administration shall review the annual budget estimate and the financial statement presented by the Director-General and make recommendations thereon to the General Council. The annual budget estimate shall be subject to approval by the General Council.
- 2. The Committee on Budget, Finance and Administration shall propose to the General Council financial regulations which shall include provisions setting out:
 - (a) the scale of contributions apportioning the expenses of the WTO among its Members; and
 - (b) the measures to be taken in respect of Members in arrears.

The financial regulations shall be based, as far as practicable, on the regulations and practices of GATT 1947.

- 3. The General Council shall adopt the financial regulations and the annual budget estimate by a two-thirds majority comprising more than half of the Members of the WTO.
- 4. Each Member shall promptly contribute to the WTO its share in the expenses of the WTO in accordance with the financial regulations adopted by the General Council.

Article VIII Status of the WTO

- 1. The WTO shall have legal personality, and shall be accorded by each of its Members such legal capacity as may be necessary for the exercise of its functions.
- 2. The WTO shall be accorded by each of its Members such privileges and immunities as are necessary for the exercise of its functions.
- 3. The officials of the WTO and the representatives of the Members shall similarly be accorded by each of its Members such privileges and immunities as are necessary for the independent exercise of their functions in connection with the WTO.
- 4. The privileges and immunities to be accorded by a Member to the WTO, its officials, and the representatives of its Members shall be similar to the privileges and immunities stipulated in the Convention on the Privileges and Immunities of the Specialized Agencies, approved by the General Assembly of the United Nations on 21 November 1947.
- 5. The WTO may conclude a headquarters agreement.

Article IX Decision-Making

1. The WTO shall continue the practice of decision-making by consensus followed under GATT 1947¹. Except as otherwise provided, where a decision cannot be arrived at by consensus, the matter at issue shall be decided by voting. At meetings of

¹ The body concerned shall be deemed to have decided by consensus on a matter submitted for its consideration, if no Member, present at the meeting when the decision is taken, formally objects to the proposed decision.

the Ministerial Conference and the General Council, each Member of the WTO shall have one vote. Where the European Communities exercise their right to vote, they shall have a number of votes equal to the number of their member States² which are Members of the WTO. Decisions of the Ministerial Conference and the General Council shall be taken by a majority of the votes cast, unless otherwise provided in this Agreement or in the relevant Multilateral Trade Agreement³.

- 2. The Ministerial Conference and the General Council shall have the exclusive authority to adopt interpretations of this Agreement and of the Multilateral Trade Agreements. In the case of an interpretation of a Multilateral Trade Agreement in Annex 1, they shall exercise their authority on the basis of a recommendation by the Council overseeing the functioning of that Agreement. The decision to adopt an interpretation shall be taken by a three-fourths majority of the Members. This paragraph shall not be used in a manner that would undermine the amendment provisions in Article X.
- 3. In exceptional circumstances, the Ministerial Conference may decide to waive an obligation imposed on a Member by this Agreement or any of the Multilateral Trade Agreements, provided that
 - (a) A request for a waiver concerning this Agreement shall be submitted to the Ministerial Conference for consideration pursuant to the practice of decision-making by consensus. The Ministerial Conference shall establish a time-period, which shall not exceed 90 days, to consider the request. If consensus is not reached during the time-period, any decision to grant a waiver shall be taken by three fourths⁴ of the Members.
 - (b) A request for a waiver concerning the Multilateral Trade Agreements in Annexes 1A or 1B or 1C and their annexes shall be submitted initially to the Council for Trade in Goods, the Council for Trade in Services or the Council for TRIPS, respectively, for consideration during a time-period which shall not exceed 90 days. At the end of the time-period, the relevant Council shall submit a report to the Ministerial Conference.
- 4. A decision by the Ministerial Conference granting a waiver shall state the exceptional circumstances justifying the decision, the terms and conditions governing the application of the waiver, and the date on which the waiver shall terminate. Any waiver granted for a period of more than one year shall be reviewed by the Ministerial Conference not later than one year after it is granted, and thereafter annually until the waiver terminates. In each review, the Ministerial Conference shall examine whether the exceptional circumstances justifying the waiver still exist and whether the terms and conditions attached to the waiver have been met. The Ministerial Conference, on the basis of the annual review, may extend, modify or terminate the waiver.
- 5. Decisions under a Plurilateral Trade Agreement, including any decisions on interpretations and waivers, shall be governed by the provisions of that Agreement.

² The number of votes of the European Communities and their member States shall in no case exceed the number of the member States of the European Communities.

³ Decisions by the General Council when convened as the Dispute Settlement Body shall be taken only in accordance with the provisions of paragraph 4 of Article 2 of the Dispute Settlement Understanding.

⁴ A decision to grant a waiver in respect of any obligation subject to a transition period or a period for staged implementation that the requesting Member has not performed by the end of the relevant period shall be taken only by consensus.

Article X Amendments

- 1. Any Member of the WTO may initiate a proposal to amend the provisions of this Agreement or the Multilateral Trade Agreements in Annex 1 by submitting such proposal to the Ministerial Conference. The Councils listed in paragraph 5 of Article IV may also submit to the Ministerial Conference proposals to amend the provisions of the corresponding Multilateral Trade Agreements in Annex 1 the functioning of which they oversee. Unless the Ministerial Conference decides on a longer period, for a period of 90 days after the proposal has been tabled formally at the Ministerial Conference any decision by the Ministerial Conference to submit the proposed amendment to the Members for acceptance shall be taken by consensus. Unless the provisions of paragraphs 2, 5 or 6 apply, that decision shall specify whether the provisions of paragraphs 3 or 4 shall apply. If consensus is reached, the Ministerial Conference shall forthwith submit the proposed amendment to the Members for acceptance. If consensus is not reached at a meeting of the Ministerial Conference within the established period, the Ministerial Conference shall decide by a two-thirds majority of the Members whether to submit the proposed amendment to the Members for acceptance. Except as provided in paragraphs 2, 5 and 6, the provisions of paragraph 3 shall apply to the proposed amendment, unless the Ministerial Conference decides by a three-fourths majority of the Members that the provisions of paragraph 4 shall apply.
- 2. Amendments to the provisions of this Article and to the provisions of the following Articles shall take effect only upon acceptance by all Members:

Article IX of this Agreement; Articles I and II of GATT 1994; Article II:1 of GATS; Article 4 of the Agreement on TRIPS.

- 3. Amendments to provisions of this Agreement, or of the Multilateral Trade Agreements in Annexes 1A and 1C, other than those listed in paragraphs 2 and 6, of a nature that would alter the rights and obligations of the Members, shall take effect for the Members that have accepted them upon acceptance by two thirds of the Members and thereafter for each other Member upon acceptance by it. The Ministerial Conference may decide by a three-fourths majority of the Members that any amendment made effective under this paragraph is of such a nature that any Member which has not accepted it within a period specified by the Ministerial Conference in each case shall be free to withdraw from the WTO or to remain a Member with the consent of the Ministerial Conference.
- 4. Amendments to provisions of this Agreement or of the Multilateral Trade Agreements in Annexes 1A and 1C, other than those listed in paragraphs 2 and 6, of a nature that would not alter the rights and obligations of the Members, shall take effect for all Members upon acceptance by two thirds of the Members.
- 5. Except as provided in paragraph 2 above, amendments to Parts I, II and III of GATS and the respective annexes shall take effect for the Members that have accepted them upon acceptance by two thirds of the Members and thereafter for each Member upon acceptance by it. The Ministerial Conference may decide by a three-fourths majority of the Members that any amendment made effective under the preceding provision is of such a nature that any Member which has not accepted it within a period specified by the Ministerial Conference in each case shall be free to withdraw from the WTO or to remain a Member with the consent of the Ministerial Conference. Amendments to Parts IV, V and VI of GATS and the respective annexes shall take effect for all Members upon acceptance by two thirds of the Members.
- 6. Notwithstanding the other provisions of this Article, amendments to the Agreement on TRIPS meeting the requirements of paragraph 2 of Article 71 thereof may be adopted by the Ministerial Conference without further formal acceptance process.
- 7. Any Member accepting an amendment to this Agreement or to a Multilateral Trade Agreement in Annex 1 shall deposit an instrument of acceptance with the Director-General of the WTO within the period of acceptance specified by the Ministerial Conference.
- 8. Any Member of the WTO may initiate a proposal to amend the provisions of the Multilateral Trade Agreements in Annexes 2 and 3 by submitting such proposal to the Ministerial Conference. The decision to approve amendments to the Multilateral Trade Agreement in Annex 2 shall be made by consensus and these amendments shall take effect for all Members upon approval by the Ministerial Conference. Decisions to approve amendments to the Multilateral Trade Agreement in Annex 3 shall take effect for all Members upon approval by the Ministerial Conference.
- 9. The Ministerial Conference, upon the request of the Members parties to a trade agreement, may decide exclusively by consensus to add that agreement to Annex 4. The Ministerial Conference, upon the request of the Members parties to a Plurilateral Trade Agreement, may decide to delete that Agreement from Annex 4.
- 10. Amendments to a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement.

Article XI Original Membership

- 1. The contracting parties to GATT 1947 as of the date of entry into force of this Agreement, and the European Communities, which accept this Agreement and the Multilateral Trade Agreements and for which Schedules of Concessions and Commitments are annexed to GATT 1994 and for which Schedules of Specific Commitments are annexed to GATS shall become original Members of the WTO.
- 2. The least-developed countries recognized as such by the United Nations will only be required to undertake commitments and concessions to the extent consistent with their individual development, financial and trade needs or their administrative and institutional capabilities.

Article XII Accession

- 1. Any State or separate customs territory possessing full autonomy in the conduct of its external commercial relations and of the other matters provided for in this Agreement and the Multilateral Trade Agreements may accede to this Agreement, on terms to be agreed between it and the WTO. Such accession shall apply to this Agreement and the Multilateral Trade Agreements annexed thereto.
- 2. Decisions on accession shall be taken by the Ministerial Conference. The Ministerial Conference shall approve the agreement on the terms of accession by a two-thirds majority of the Members of the WTO.
- 3. Accession to a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement.

Article XIII

Non-Application of Multilateral Trade Agreements between Particular Members

1. This Agreement and the Multilateral Trade Agreements in Annexes 1 and 2 shall not apply as between any Member and any other Member if either of the Members, at the time either becomes a Member, does not consent to such application.

- 2. Paragraph 1 may be invoked between original Members of the WTO which were contracting parties to GATT 1947 only where Article XXXV of that Agreement had been invoked earlier and was effective as between those contracting parties at the time of entry into force for them of this Agreement.
- 3. Paragraph 1 shall apply between a Member and another Member which has acceded under Article XII only if the Member not consenting to the application has so notified the Ministerial Conference before the approval of the agreement on the terms of accession by the Ministerial Conference.
- 4. The Ministerial Conference may review the operation of this Article in particular cases at the request of any Member and make appropriate recommendations.
- 5. Non-application of a Plurilateral Trade Agreement between parties to that Agreement shall be governed by the provisions of that Agreement.

Article XIV Acceptance, Entry into Force and Deposit

- 1. This Agreement shall be open for acceptance, by signature or otherwise, by contracting parties to GATT 1947, and the European Communities, which are eligible to become original Members of the WTO in accordance with Article XI of this Agreement. Such acceptance shall apply to this Agreement and the Multilateral Trade Agreements annexed hereto. This Agreement and the Multilateral Trade Agreements annexed hereto shall enter into force on the date determined by Ministers in accordance with paragraph 3 of the Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations and shall remain open for acceptance for a period of two years following that date unless the Ministers decide otherwise. An acceptance following the entry into force of this Agreement shall enter into force on the 30th day following the date of such acceptance.
- 2. A Member which accepts this Agreement after its entry into force shall implement those concessions and obligations in the Multilateral Trade Agreements that are to be implemented over a period of time starting with the entry into force of this Agreement as if it had accepted this Agreement on the date of its entry into force.
- 3. Until the entry into force of this Agreement, the text of this Agreement and the Multilateral Trade Agreements shall be deposited with the Director-General to the CONTRACTING PARTIES to GATT 1947. The Director-General shall promptly furnish a certified true copy of this Agreement and the Multilateral Trade Agreements, and a notification of each acceptance thereof, to each government and the European Communities having accepted this Agreement. This Agreement and the Multilateral Trade Agreements, and any amendments thereto, shall, upon the entry into force of this Agreement, be deposited with the Director-General of the WTO.
- 4. The acceptance and entry into force of a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement. Such Agreements shall be deposited with the Director-General to the CONTRACTING PARTIES to GATT 1947. Upon the entry into force of this Agreement, such Agreements shall be deposited with the Director-General of the WTO.

Article XV Withdrawal

- 1. Any Member may withdraw from this Agreement. Such withdrawal shall apply both to this Agreement and the Multilateral Trade Agreements and shall take effect upon the expiration of six months from the date on which written notice of withdrawal is received by the Director-General of the WTO.
- 2. Withdrawal from a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement.

Article XVI Miscellaneous Provisions

- 1. Except as otherwise provided under this Agreement or the Multilateral Trade Agreements, the WTO shall be guided by the decisions, procedures and customary practices followed by the CONTRACTING PARTIES to GATT 1947 and the bodies established in the framework of GATT 1947.
- 2. To the extent practicable, the Secretariat of GATT 1947 shall become the Secretariat of the WTO, and the Director-General to the CONTRACTING PARTIES to GATT 1947, until such time as the Ministerial Conference has appointed a Director-General in accordance with paragraph 2 of Article VI of this Agreement, shall serve as Director-General of the WTO.
- 3. In the event of a conflict between a provision of this Agreement and a provision of any of the Multilateral Trade Agreements, the provision of this Agreement shall prevail to the extent of the conflict.
- 4. Each Member shall ensure the conformity of its laws, regulations and administrative procedures with its obligations as provided in the annexed Agreements.
- 5. No reservations may be made in respect of any provision of this Agreement. Reservations in respect of any of the provisions of the Multilateral Trade Agreements may only be made to the extent provided for in those Agreements. Reservations in respect of a provision of a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement.
- 6. This Agreement shall be registered in accordance with the provisions of Article 102 of the Charter of the United Nations.

DONE at Marrakesh this fifteenth day of April one thousand nine hundred and ninety-four, in a single copy, in the English, French and Spanish languages, each text being authentic.

Explanatory Notes:

The terms "country" or "countries" as used in this Agreement and the Multilateral Trade Agreements are to be understood to include any separate customs territory Member of the WTO.

In the case of a separate customs territory Member of the WTO, where an expression in this Agreement and the Multilateral Trade Agreements is qualified by the term "national", such expression shall be read as pertaining to that customs territory, unless otherwise specified.

ANNEX 1

ANNEX 1A: Multilateral Agreements on Trade in Goods

General Agreement on Tariffs and Trade 1994 Agreement on Agriculture Agreement on the Application of Sanitary and Phytosanitary Measures Agreement on Textiles and Clothing Agreement on Technical Barriers to Trade Agreement on Trade-Related Investment Measures Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994 Agreement on Implementation of Article VII of the General Agreement on Tariffs and Trade 1994 Agreement on Preshipment Inspection Agreement on Rules of Origin Agreement on Import Licensing Procedures Agreement on Subsidies and Countervailing Measures Agreement on Safeguards

ANNEX 1B: General Agreement on Trade in Services and Annexes

ANNEX 1C: Agreement on Trade-Related Aspects of Intellectual Property Rights

ANNEX 2

Understanding on Rules and Procedures Governing the Settlement of Disputes

ANNEX 3

Trade Policy Review Mechanism

ANNEX 4

Plurilateral Trade Agreements

Agreement on Trade in Civil Aircraft Agreement on Government Procurement International Dairy Agreement International Bovine Meat Agreement

APPENDIX III URUGUAY ROUND AGREEMENT Agreement on Agriculture

Members,

Having decided to establish a basis for initiating a process of reform of trade in agriculture in line with the objectives of the negotiations as set out in the Punta del Este Declaration;

Recalling that their long-term objective as agreed at the Mid-Term Review of the Uruguay Round "is to establish a fair and market-oriented agricultural trading system and that a reform process should be initiated through the negotiation of commitments on support and protection and through the establishment of strengthened and more operationally effective GATT rules and disciplines";

Recalling further that "the above-mentioned long-term objective is to provide for substantial progressive reductions in agricultural support and protection sustained over an agreed period of time, resulting in correcting and preventing restrictions and distortions in world agricultural markets";

Committed to achieving specific binding commitments in each of the following areas: market access; domestic support; export competition; and to reaching an agreement on sanitary and phytosanitary issues;

Having agreed that in implementing their commitments on market access, developed country Members would take fully into account the particular needs and conditions of developing country Members by providing for a greater improvement of opportunities and terms of access for agricultural products of particular interest to these Members, including the fullest liberalization of trade in tropical agricultural products as agreed at the Mid-Term Review, and for products of particular importance to the diversification of production from the growing of illicit narcotic crops;

Noting that commitments under the reform programme should be made in an equitable way among all Members, having regard to non-trade concerns, including food security and the need to protect the environment; having regard to the agreement that special and differential treatment for developing countries is an integral element of the negotiations, and taking into account the possible negative effects of the implementation of the reform programme on least-developed and net food-importing developing countries;

Hereby agree as follows:

Part I: Article 1 - Definition of Terms

In this Agreement, unless the context otherwise requires:

- (a) "Aggregate Measurement of Support" and "AMS" mean the annual level of support, expressed in monetary terms, provided for an agricultural product in favour of the producers of the basic agricultural product or non-product-specific support provided in favour of agricultural producers in general, other than support provided under programmes that qualify as exempt from reduction under Annex 2 to this Agreement, which is:
 - (i) with respect to support provided during the base period, specified in the relevant tables of supporting material incorporated by reference in Part IV of a Member's Schedule; and

- (ii) with respect to support provided during any year of the implementation period and thereafter, calculated in accordance with the provisions of Annex 3 of this Agreement and taking into account the constituent data and methodology used in the tables of supporting material incorporated by reference in Part IV of the Member's Schedule;
- (b) "basic agricultural product" in relation to domestic support commitments is defined as the product as close as practicable to the point of first sale as specified in a Member's Schedule and in the related supporting material;
- (c) "budgetary outlays" or "outlays" includes revenue foregone;
- (d) "Equivalent Measurement of Support" means the annual level of support, expressed in monetary terms, provided to producers of a basic agricultural product through the application of one or more measures, the calculation of which in accordance with the AMS methodology is impracticable, other than support provided under programmes that qualify as exempt from reduction under Annex 2 to this Agreement, and which is:
 - (i) with respect to support provided during the base period, specified in the relevant tables of supporting material incorporated by reference in Part IV of a Member's Schedule; and
 - (ii) with respect to support provided during any year of the implementation period and thereafter, calculated in accordance with the provisions of Annex 4 of this Agreement and taking into account the constituent data and methodology used in the tables of supporting material incorporated by reference in Part IV of the Member's Schedule;
- (e) "export subsidies" refers to subsidies contingent upon export performance, including the export subsidies listed in Article 9 of this Agreement;
- (f) "implementation period" means the six-year period commencing in the year 1995, except that, for the purposes of Article 13, it means the nine-year period commencing in 1995;
- (g) "market access concessions" includes all market access commitments undertaken pursuant to this Agreement;
- (h) "Total Aggregate Measurement of Support" and "Total AMS" mean the sum of all domestic support provided in favour of agricultural producers, calculated as the sum of all aggregate measurements of support for basic agricultural products, all nonproduct-specific aggregate measurements of support and all equivalent measurements of support for agricultural products, and which is:
 - (i) with respect to support provided during the base period (i.e. the "Base Total AMS") and the maximum support permitted to be provided during any year of the implementation period or thereafter (i.e. the "Annual and Final Bound Commitment Levels"), as specified in Part IV of a Member's Schedule; and
 - (ii) with respect to the level of support actually provided during any year of the implementation period and thereafter (i.e. the "Current Total AMS"), calculated in accordance with the provisions of this Agreement, including Article 6, and with the constituent data and methodology used in the tables of supporting material incorporated by reference in Part IV of the Member's Schedule;
- (i) "year" in paragraph (f) above and in relation to the specific commitments of a Member refers to the calendar, financial or marketing year specified in the Schedule relating to that Member.

Part I: Article 2 - Product Coverage

This Agreement applies to the products listed in Annex 1 to this Agreement, hereinafter referred to as agricultural products.

Part II: Article 3 - Incorporation of Concessions and Commitments

- 1. The domestic support and export subsidy commitments in Part IV of each Member's Schedule constitute commitments limiting subsidization and are hereby made an integral part of GATT 1994.
- 2. Subject to the provisions of Article 6, a Member shall not provide support in favour of domestic producers in excess of the commitment levels specified in Section I of Part IV of its Schedule.
- 3. Subject to the provisions of paragraphs 2(b) and 4 of Article 9, a Member shall not provide export subsidies listed in paragraph 1 of Article 9 in respect of the agricultural products or groups of products specified in Section II of Part IV of its Schedule in excess of the budgetary outlay and quantity commitment levels specified therein and shall not provide such subsidies in respect of any agricultural product not specified in that Section of its Schedule.

Part III: Article 4 - Market Access

- 1. Market access concessions contained in Schedules relate to bindings and reductions of tariffs, and to other market access commitments as specified therein.
- 2. Members shall not maintain, resort to, or revert to any measures of the kind which have been required to be converted into ordinary customs duties ($\underline{1}$), except as otherwise provided for in Article 5 and Annex 5.

Part III: Article 5 - Special Safeguard Provisions

- 1. Notwithstanding the provisions of paragraph 1(b) of Article II of GATT 1994, any Member may take recourse to the provisions of paragraphs 4 and 5 below in connection with the importation of an agricultural product, in respect of which measures referred to in paragraph 2 of Article 4 of this Agreement have been converted into an ordinary customs duty and which is designated in its Schedule with the symbol "SSG" as being the subject of a concession in respect of which the provisions of this Article may be invoked, if:
 - (a) the volume of imports of that product entering the customs territory of the Member granting the concession during any year exceeds a trigger level which relates to the existing market access opportunity as set out in paragraph 4; or, but not concurrently:
 - (b) the price at which imports of that product may enter the customs territory of the Member granting the concession, as determined on the basis of the c.i.f. import price of the shipment concerned expressed in terms of its domestic currency, falls below a trigger price equal to the average 1986 to 1988 reference price(<u>2</u>) for the product concerned.
- 2. Imports under current and minimum access commitments established as part of a concession referred to in paragraph 1 above shall be counted for the purpose of determining the volume of imports required for invoking the provisions of subparagraph 1(a) and paragraph 4, but imports under such commitments shall not be affected by any additional duty imposed under either subparagraph 1(a) and paragraph 1(b) and paragraph 5 below.
- 3. Any supplies of the product in question which were *en route* on the basis of a contract settled before the additional duty is imposed under subparagraph 1(a) and paragraph 4 shall be exempted from any such additional duty, provided that they may be counted in the volume of imports of the product in question during the following year for the purposes of triggering the provisions of subparagraph 1(a) in that year.
- 4. Any additional duty imposed under subparagraph 1(a) shall only be maintained until the end of the year in which it has been imposed, and may only be levied at a level which shall not exceed one third of the level of the ordinary customs duty in effect in

the year in which the action is taken. The trigger level shall be set according to the following schedule based on market access opportunities defined as imports as a percentage of the corresponding domestic consumption($\underline{3}$) during the three preceding years for which data are available:

- (a) where such market access opportunities for a product are less than or equal to 10 per cent, the base trigger level shall equal 125 per cent;
- (b) where such market access opportunities for a product are greater than 10 per cent but less than or equal to 30 per cent, the base trigger level shall equal 110 per cent;
- (c) where such market access opportunities for a product are greater than 30 per cent, the base trigger level shall equal 105 per cent.

In all cases the additional duty may be imposed in any year where the absolute volume of imports of the product concerned entering the customs territory of the Member granting the concession exceeds the sum of (x) the base trigger level set out above multiplied by the average quantity of imports during the three preceding years for which data are available and (y) the absolute volume change in domestic consumption of the product concerned in the most recent year for which data are available compared to the preceding year, provided that the trigger level shall not be less than 105 per cent of the average quantity of imports in (x) above.

- 5. The additional duty imposed under subparagraph 1(b) shall be set according to the following schedule:
 - (a) if the difference between the c.i.f. import price of the shipment expressed in terms of the domestic currency (hereinafter referred to as the "import price") and the trigger price as defined under that subparagraph is less than or equal to 10 per cent of the trigger price, no additional duty shall be imposed;
 - (b) if the difference between the import price and the trigger price (hereinafter referred to as the "difference") is greater than 10 per cent but less than or equal to 40 per cent of the trigger price, the additional duty shall equal 30 per cent of the amount by which the difference exceeds 10 per cent;
 - (c) if the difference is greater than 40 per cent but less than or equal to 60 per cent of the trigger price, the additional duty shall equal 50 per cent of the amount by which the difference exceeds 40 per cent, plus the additional duty allowed under (b);
 - (d) if the difference is greater than 60 per cent but less than or equal to 75 per cent, the additional duty shall equal 70 per cent of the amount by which the difference exceeds 60 per cent of the trigger price, plus the additional duties allowed under (b) and (c);
 - (e) if the difference is greater than 75 per cent of the trigger price, the additional duty shall equal 90 per cent of the amount by which the difference exceeds 75 per cent, plus the additional duties allowed under (b), (c) and (d).
- 6. For perishable and seasonal products, the conditions set out above shall be applied in such a manner as to take account of the specific characteristics of such products. In particular, shorter time periods under subparagraph 1(a) and paragraph 4 may be used in reference to the corresponding periods in the base period and different reference prices for different periods may be used under subparagraph 1(b).
- 7. The operation of the special safeguard shall be carried out in a transparent manner. Any Member taking action under subparagraph 1(a) above shall give notice in writing, including relevant data, to the Committee on Agriculture as far in advance as may be practicable and in any event within 10 days of the implementation of such action. In cases where changes in consumption volumes must be allocated to individual tariff lines subject to action under paragraph 4, relevant data shall include the information and methods used to allocate these changes. A Member taking action under paragraph 4 shall afford any interested Members the opportunity to consult with it in respect of the conditions of application of such action. Any Member taking

action under subparagraph 1(b) above shall give notice in writing, including relevant data, to the Committee on Agriculture within 10 days of the implementation of the first such action or, for perishable and seasonal products, the first action in any period. Members undertake, as far as practicable, not to take recourse to the provisions of subparagraph 1(b) where the volume of imports of the products concerned are declining. In either case a Member taking such action shall afford any interested Members the opportunity to consult with it in respect of the conditions of application of such action.

- 8. Where measures are taken in conformity with paragraphs 1 through 7 above, Members undertake not to have recourse, in respect of such measures, to the provisions of paragraphs 1(a) and 3 of Article XIX of GATT 1994 or paragraph 2 of Article 8 of the Agreement on Safeguards.
- 9. The provisions of this Article shall remain in force for the duration of the reform process as determined under Article 20.

Part IV: Article 6 - Domestic Support Commitments

- 1. The domestic support reduction commitments of each Member contained in Part IV of its Schedule shall apply to all of its domestic support measures in favour of agricultural producers with the exception of domestic measures which are not subject to reduction in terms of the criteria set out in this Article and in Annex 2 to this Agreement. The commitments are expressed in terms of Total Aggregate Measurement of Support and "Annual and Final Bound Commitment Levels".
- 2. In accordance with the Mid-Term Review Agreement that government measures of assistance, whether direct or indirect, to encourage agricultural and rural development are an integral part of the development programmes of developing countries, investment subsidies which are generally available to agriculture in developing country Members and agricultural input subsidies generally available to low-income or resource-poor producers in developing country Members shall be exempt from domestic support reduction commitments that would otherwise be applicable to such measures, as shall domestic support to producers in developing country Members to encourage diversification from growing illicit narcotic crops. Domestic support meeting the criteria of this paragraph shall not be required to be included in a Member's calculation of its Current Total AMS.
- 3. A Member shall be considered to be in compliance with its domestic support reduction commitments in any year in which its domestic support in favour of agricultural producers expressed in terms of Current Total AMS does not exceed the corresponding annual or final bound commitment level specified in Part IV of the Member's Schedule.
- 4. (a) A Member shall not be required to include in the calculation of its Current Total AMS and shall not be required to reduce:
 - product-specific domestic support which would otherwise be required to be included in a Member's calculation of its Current AMS where such support does not exceed 5 per cent of that Member's total value of production of a basic agricultural product during the relevant year; and
 - (ii) non-product-specific domestic support which would otherwise be required to be included in a Member's calculation of its Current AMS where such support does not exceed 5 per cent of the value of that Member's total agricultural production.
 - (b) For developing country Members, the *de minimis* percentage under this paragraph shall be 10 per cent.
- 5. (a) Direct payments under production-limiting programmes shall not be subject to the commitment to reduce domestic support if:
 - (i) such payments are based on fixed area and yields; or

- (ii) such payments are made on 85 per cent or less of the base level of production; or
- (iii) livestock payments are made on a fixed number of head.
- (b) The exemption from the reduction commitment for direct payments meeting the above criteria shall be reflected by the exclusion of the value of those direct payments in a Member's calculation of its Current Total AMS.

Part IV: Article 7 - General Disciplines on Domestic Support

- 1. Each Member shall ensure that any domestic support measures in favour of agricultural producers which are not subject to reduction commitments because they qualify under the criteria set out in Annex 2 to this Agreement are maintained in conformity therewith.
- 2. (a) Any domestic support measure in favour of agricultural producers, including any modification to such measure, and any measure that is subsequently introduced that cannot be shown to satisfy the criteria in Annex 2 to this Agreement or to be exempt from reduction by reason of any other provision of this Agreement shall be included in the Member's calculation of its Current Total AMS.
 - (b) Where no Total AMS commitment exists in Part IV of a Member's Schedule, the Member shall not provide support to agricultural producers in excess of the relevant *de minimis* level set out in paragraph 4 of Article 6.

Part V: Article 8 - Export Competition Commitments

Each Member undertakes not to provide export subsidies otherwise than in conformity with this Agreement and with the commitments as specified in that Member's Schedule.

Part V: Article 9 - Export Subsidy Commitments

- 1. The following export subsidies are subject to reduction commitments under this Agreement:
 - (a) the provision by governments or their agencies of direct subsidies, including payments-in-kind, to a firm, to an industry, to producers of an agricultural product, to a cooperative or other association of such producers, or to a marketing board, contingent on export performance;
 - (b) the sale or disposal for export by governments or their agencies of noncommercial stocks of agricultural products at a price lower than the comparable price charged for the like product to buyers in the domestic market;
 - (c) payments on the export of an agricultural product that are financed by virtue of governmental action, whether or not a charge on the public account is involved, including payments that are financed from the proceeds of a levy imposed on the agricultural product concerned or on an agricultural product from which the exported product is derived;
 - (d) the provision of subsidies to reduce the costs of marketing exports of agricultural products (other than widely available export promotion and advisory services) including handling, upgrading and other processing costs, and the costs of international transport and freight;
 - (e) internal transport and freight charges on export shipments, provided or mandated by governments, on terms more favourable than for domestic shipments;
 - (f) subsidies on agricultural products contingent on their incorporation in exported products.

- 2. (a) Except as provided in subparagraph (b), the export subsidy commitment levels for each year of the implementation period, as specified in a Member's Schedule, represent with respect to the export subsidies listed in paragraph 1 of this Article:
 - (i) in the case of budgetary outlay reduction commitments, the maximum level of expenditure for such subsidies that may be allocated or incurred in that year in respect of the agricultural product, or group of products, concerned; and
 - (ii) in the case of export quantity reduction commitments, the maximum quantity of an agricultural product, or group of products, in respect of which such export subsidies may be granted in that year.
 - (b) In any of the second through fifth years of the implementation period, a Member may provide export subsidies listed in paragraph 1 above in a given year in excess of the corresponding annual commitment levels in respect of the products or groups of products specified in Part IV of the Member's Schedule, provided that:
 - the cumulative amounts of budgetary outlays for such subsidies, from the beginning of the implementation period through the year in question, does not exceed the cumulative amounts that would have resulted from full compliance with the relevant annual outlay commitment levels specified in the Member's Schedule by more than 3 per cent of the base period level of such budgetary outlays;
 - (ii) the cumulative quantities exported with the benefit of such export subsidies, from the beginning of the implementation period through the year in question, does not exceed the cumulative quantities that would have resulted from full compliance with the relevant annual quantity commitment levels specified in the Member's Schedule by more than 1.75 per cent of the base period quantities;
 - (iii) the total cumulative amounts of budgetary outlays for such export subsidies and the quantities benefiting from such export subsidies over the entire implementation period are no greater than the totals that would have resulted from full compliance with the relevant annual commitment levels specified in the Member's Schedule; and
 - (iv) the Member's budgetary outlays for export subsidies and the quantities benefiting from such subsidies, at the conclusion of the implementation period, are no greater than 64 per cent and 79 per cent of the 1986-1990 base period levels, respectively. For developing country Members these percentages shall be 76 and 86 per cent, respectively.
- 3. Commitments relating to limitations on the extension of the scope of export subsidization are as specified in Schedules.
- 4. During the implementation period, developing country Members shall not be required to undertake commitments in respect of the export subsidies listed in subparagraphs (d) and (e) of paragraph 1 above, provided that these are not applied in a manner that would circumvent reduction commitments.

Part V: Article 10 - Prevention of Circumvention of Export Subsidy Commitments

- 1. Export subsidies not listed in paragraph 1 of Article 9 shall not be applied in a manner which results in, or which threatens to lead to, circumvention of export subsidy commitments; nor shall non-commercial transactions be used to circumvent such commitments.
- 2. Members undertake to work toward the development of internationally agreed disciplines to govern the provision of export credits, export credit guarantees or insurance programmes and, after agreement on such disciplines, to provide export

credits, export credit guarantees or insurance programmes only in conformity therewith.

- 3. Any Member which claims that any quantity exported in excess of a reduction commitment level is not subsidized must establish that no export subsidy, whether listed in Article 9 or not, has been granted in respect of the quantity of exports in question.
- 4. Members donors of international food aid shall ensure:
 - (a) that the provision of international food aid is not tied directly or indirectly to commercial exports of agricultural products to recipient countries;
 - (b) that international food aid transactions, including bilateral food aid which is monetized, shall be carried out in accordance with the FAO "Principles of Surplus Disposal and Consultative Obligations", including, where appropriate, the system of Usual Marketing Requirements (UMRs); and
 - (c) that such aid shall be provided to the extent possible in fully grant form or on terms no less concessional than those provided for in Article IV of the Food Aid Convention 1986.

Part V: Article 11 - Incorporated Products

1. In no case may the per-unit subsidy paid on an incorporated agricultural primary product exceed the per-unit export subsidy that would be payable on exports of the primary product as such.

Part VI: Article 12 - Disciplines on Export Prohibitions and Restrictions

- 1. Where any Member institutes any new export prohibition or restriction on foodstuffs in accordance with paragraph 2(a) of Article XI of GATT 1994, the Member shall observe the following provisions:
 - (a) the Member instituting the export prohibition or restriction shall give due consideration to the effects of such prohibition or restriction on importing Members' food security;
 - (b) before any Member institutes an export prohibition or restriction, it shall give notice in writing, as far in advance as practicable, to the Committee on Agriculture comprising such information as the nature and the duration of such measure, and shall consult, upon request, with any other Member having a substantial interest as an importer with respect to any matter related to the measure in question. The Member instituting such export prohibition or restriction shall provide, upon request, such a Member with necessary information.
- 2. The provisions of this Article shall not apply to any developing country Member, unless the measure is taken by a developing country Member which is a net-food exporter of the specific foodstuff concerned.

Part VII: Article 13 - Due Restraint

During the implementation period, notwithstanding the provisions of GATT 1994 and the Agreement on Subsidies and Countervailing Measures (referred to in this Article as the "Subsidies Agreement"):

- (a) domestic support measures that conform fully to the provisions of Annex 2 to this Agreement shall be:
 - (i) non-actionable subsidies for purposes of countervailing duties(<u>4</u>);
 - (ii) exempt from actions based on Article XVI of GATT 1994 and Part III of the Subsidies Agreement; and

- (iii) exempt from actions based on non-violation nullification or impairment of the benefits of tariff concessions accruing to another Member under Article II of GATT 1994, in the sense of paragraph 1(b) of Article XXIII of GATT 1994;
- (b) domestic support measures that conform fully to the provisions of Article 6 of this Agreement including direct payments that conform to the requirements of paragraph 5 thereof, as reflected in each Member's Schedule, as well as domestic support within *de minimis* levels and in conformity with paragraph 2 of Article 6, shall be:
 - (i) exempt from the imposition of countervailing duties unless a determination of injury or threat thereof is made in accordance with Article VI of GATT 1994 and Part V of the Subsidies Agreement, and due restraint shall be shown in initiating any countervailing duty investigations;
 - (ii) exempt from actions based on paragraph 1 of Article XVI of GATT 1994 or Articles 5 and 6 of the Subsidies Agreement, provided that such measures do not grant support to a specific commodity in excess of that decided during the 1992 marketing year; and
 - (iii) exempt from actions based on non-violation nullification or impairment of the benefits of tariff concessions accruing to another Member under Article II of GATT 1994, in the sense of paragraph 1(b) of Article XXIII of GATT 1994, provided that such measures do not grant support to a specific commodity in excess of that decided during the 1992 marketing year;
- (c) export subsidies that conform fully to the provisions of Part V of this Agreement, as reflected in each Member's Schedule, shall be:
 - subject to countervailing duties only upon a determination of injury or threat thereof based on volume, effect on prices, or consequent impact in accordance with Article VI of GATT 1994 and Part V of the Subsidies Agreement, and due restraint shall be shown in initiating any countervailing duty investigations; and
 - (ii) exempt from actions based on Article XVI of GATT 1994 or Articles 3, 5 and 6 of the Subsidies Agreement.

Part VIII: Article 14 - Sanitary and Phytosanitary Measures

Members agree to give effect to the Agreement on the Application of Sanitary and Phytosanitary Measures.

Part IX: Article 15 - Special and Differential Treatment

- 1. In keeping with the recognition that differential and more favourable treatment for developing country Members is an integral part of the negotiation, special and differential treatment in respect of commitments shall be provided as set out in the relevant provisions of this Agreement and embodied in the Schedules of concessions and commitments.
- 2. Developing country Members shall have the flexibility to implement reduction commitments over a period of up to 10 years. Least-developed country Members shall not be required to undertake reduction commitments.

Part X: Article 16 - Least-Developed and Net Food-Importing Developing Countries

- 1. Developed country Members shall take such action as is provided for within the framework of the Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries.
- 2. The Committee on Agriculture shall monitor, as appropriate, the follow-up to this Decision.

Part XI: Article 17 - Committee on Agriculture

A Committee on Agriculture is hereby established.

Part XI: Article 18 - Review of the Implementation of Commitments

- 1. Progress in the implementation of commitments negotiated under the Uruguay Round reform programme shall be reviewed by the Committee on Agriculture.
- 2. The review process shall be undertaken on the basis of notifications submitted by Members in relation to such matters and at such intervals as shall be determined, as well as on the basis of such documentation as the Secretariat may be requested to prepare in order to facilitate the review process.
- 3. In addition to the notifications to be submitted under paragraph 2, any new domestic support measure, or modification of an existing measure, for which exemption from reduction is claimed shall be notified promptly. This notification shall contain details of the new or modified measure and its conformity with the agreed criteria as set out either in Article 6 or in Annex 2.
- 4. In the review process Members shall give due consideration to the influence of excessive rates of inflation on the ability of any Member to abide by its domestic support commitments.
- 5. Members agree to consult annually in the Committee on Agriculture with respect to their participation in the normal growth of world trade in agricultural products within the framework of the commitments on export subsidies under this Agreement.
- 6. The review process shall provide an opportunity for Members to raise any matter relevant to the implementation of commitments under the reform programme as set out in this Agreement.
- 7. Any Member may bring to the attention of the Committee on Agriculture any measure which it considers ought to have been notified by another Member.

Part XI: Article 19 - Consultation and Dispute Settlement

The provisions of Articles XXII and XXIII of GATT 1994, as elaborated and applied by the Dispute Settlement Understanding, shall apply to consultations and the settlement of disputes under this Agreement.

Part XII: Article 20 - Continuation of the Reform Process

Recognizing that the long-term objective of substantial progressive reductions in support and protection resulting in fundamental reform is an ongoing process, Members agree that negotiations for continuing the process will be initiated one year before the end of the implementation period, taking into account:

- (a) the experience to that date from implementing the reduction commitments;
- (b) the effects of the reduction commitments on world trade in agriculture;
- (c) non-trade concerns, special and differential treatment to developing country Members, and the objective to establish a fair and market-oriented agricultural trading system, and the other objectives and concerns mentioned in the preamble to this Agreement; and
- (d) what further commitments are necessary to achieve the above mentioned long-term objectives.

Part XIII: Article 21 - Final Provisions

- 1. The provisions of GATT 1994 and of other Multilateral Trade Agreements in Annex 1A to the WTO Agreement shall apply subject to the provisions of this Agreement.
- 2. The Annexes to this Agreement are hereby made an integral part of this Agreement.

1	Albania	8 September 2000
2	Angola	23 November 1996
3	Antigua and Barbuda	1 January 1995
4	Argentina	1 January 1995
5	Armenia	5 February 2003
6	Australia	1 January 1995
7	Austria	1 January 1995
8	Bahrain, Kingdom of	1 January 1995
9	Bangladesh	1 January 1995
10	Barbados	1 January 1995
11	Belgium	1 January 1995
12	Belize	1 January 1995
13	Benin	22 February 1996
14	Bolivia, Plurinational State of	12 September 1995
15	Botswana	31 May 1995
16	Brazil	1 January 1995
17	Brunei Darussalam	1 January 1995
18	Bulgaria	1 December 1996
19	Burkina Faso	3 June 1995
20	Burundi	23 July 1995
21	Cambodia	13 October 2004
22	Cameroon	13 December 1995
23	Canada	1 January 1995
24	Cape Verde	23 July 2008
25	Central African Republic	31 May 1995
26	Chad	19 October 1996
27	Chile	1 January 1995
28	China	11 December 2001
29	Colombia	30 April 1995
30	Congo	27 March 1997
31	Costa Rica	1 January 1995
32	Côte d'Ivoire	1 January 1995
33	Croatia	30 November 2000
34	Cuba	20 April 1995
35	Cyprus	30 July 1995
36	Czech Republic	1 January 1995
37	Democratic Republic of the Congo	1 January 1997
38	Denmark	1 January 1995
39	Djibouti	31 May 1995
40	Dominica	1 January 1995
41	Dominican Republic	9 March 1995
42	Ecuador	21 January 1996
43	Egypt	30 June 1995
44	El Salvador	7 May 1995
45	Estonia	13 November 1999
46	European Union (formerly European Communities)	1 January 1995
47		14 January 1996
48	Finland	1 January 1995
49	France	1 January 1995
50	Gabon	1 January 1995

APPENDIX IV Members of the WTO (As of March 2012)

51	The Gambia	23 October 1996
52	Georgia	14 June 2000
53	Germany	1 January 1995
54	Ghana	1 January 1995
55	Greece	1 January 1995
56	Grenada	22 February 1996
57	Guatemala	21 July 1995
58	Guinea	25 October 1995
59	Guinea-Bissau	31 May 1995
60	Guyana	1 January 1995
61	Haiti	30 January 1996
62	Honduras	1 January 1995
63	Hong Kong, China	1 January 1995
64	Hungary	1 January 1995
65	Iceland	1 January 1995
66	India	1 January 1995
67	Indonesia	1 January 1995
68	Ireland	1 January 1995
69	Israel	21 April 1995
70	Italy	1 January 1995
71	Jamaica	9 March 1995
72	Japan	1 January 1995
73	Jordan	11 April 2000
74	Kenya	1 January 1995
75	Korea, Republic of	1 January 1995
76	Kuwait, the State of	1 January 1995
77	Kyrgyz Republic	20 December 1998
78	Latvia	10 February 1999
79	Lesotho	31 May 1995
80	Liechtenstein	1 September 1995
81	Lithuania	31 May 2001
82	Luxembourg	1 January 1995
83	Macao, China	17 November 1995
84	Madagascar	31 May 1995
85	Malawi	1 January 1995
86	Malaysia	31 May 1995
87	Maldives	31 May 1995
88	Mali	31 May 1995
89	Malta	1 January 1995
90	Mauritania	31 May 1995
91	Mauritius	1 January 1995
92	Mexico	1 January 1995
93	Moldova, Republic of	26 July 2001
94	Mongolia	29 January 1997
95	Montenegro	29 April 2012
96	Morocco	1 January 1995
97	Mozambique	26 August 1995
98	Myanmar	1 January 1995
99	Namibia	1 January 1995
100	Nepal	23 April 2004
101	Netherlands	1 January 1995
102	New Zealand	1 January 1995
103	Nicaragua	3 September 1995

104	Niger	13 December 1996
105	Nigeria	1 January 1995
106	Norway	1 January 1995
107	Oman	9 November 2000
108	Pakistan	1 January 1995
109	Panama	6 September 1997
110	Papua New Guinea	9 June 1996
111	Paraguay	1 January 1995
112	Peru	1 January 1995
113	Philippines	1 January 1995
114	Poland	1 July 1995
115	Portugal	1 January 1995
116	Qatar	13 January 1996
117	Romania	1 January 1995
118	Rwanda	22 May 1996
119	Saint Kitts and Nevis	21 February 1996
120	Saint Lucia	1 January 1995
121	Saint Vincent & the Grenadines	1 January 1995
122	Saudi Arabia, Kingdom of	11 December 2005
123	Senegal	1 January 1995
124	Sierra Leone	23 July 1995
125	Singapore	1 January 1995
126	Slovak Republic	1 January 1995
127	Slovenia	30 July 1995
128	Solomon Islands	26 July 1996
120	South Africa	1 January 1995
130	Spain	1 January 1995
131	Sri Lanka	1 January 1995
132	Suriname	1 January 1995
133	Swaziland	1 January 1995
134	Sweden	1 January 1995
135	Switzerland	1 July 1995
136	Chinese Taipei	i buly 1990
130	Tanzania	1 January 1995
138	Thailand	1 January 1995
130	The former Yugoslav Republic of Macedonia (FYROM)	4 April 2003
140		31 May 1995
141	Tonga	27 July 2007
142	Trinidad and Tobago	1 March 1995
143	Tunisia	29 March 1995
144	Turkey	26 March 1995
145	Uganda	1 January 1995
146	Ukraine	16 May 2008
147	United Arab Emirates	10 April 1996
148	United Kingdom	1 January 1995
149	United States of America	1 January 1995
150	Urnonay	1 January 1995
150	Venezuela Bolivarian Republic of	1 January 1995
157	Viet Nam	11 January 2007
152	Zambia	1 January 1995
154	Zimbahwe	5 March 1005
1.04		

Observer Government of the WTO

1	Afghanistan
2	Algeria
3	Andorra
4	Azerbaijan
5	Bahamas
6	Belarus
7	Bhutan
8	Bosnia and Herzegovina
9	Comoros
10	Equatorial Guinea
11	Ethiopia
12	Holy See (Vatican)
13	Iran
14	Iraq
15	Kazakhstan
16	Lao People's Democratic Republic
17	Lebanese Republic
18	Liberia, Republic of
19	Libya
20	Russian Federation
21	Samoa
22	Sao Tomé and Principe
23	Serbia
24	Seychelles
25	Sudan
26	Syrian Arab Republic
27	Tajikistan
28	Uzbekistan
29	Vanuatu
30	Yemen

APPENDIX V

SANITARY AND PHYTOSANITARY MEASURES: TEXT OF THE AGREEMENT The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement)

Members,

Reaffirming that no Member should be prevented from adopting or enforcing measures necessary to protect human, animal or plant life or health, subject to the requirement that these measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between Members where the same conditions prevail or a disguised restriction on international trade;

Desiring to improve the human health, animal health and phytosanitary situation in all Members;

Noting that sanitary and phytosanitary measures are often applied on the basis of bilateral agreements or protocols;

Desiring the establishment of a multilateral framework of rules and disciplines to guide the development, adoption and enforcement of sanitary and phytosanitary measures in order to minimize their negative effects on trade;

Recognizing the important contribution that international standards, guidelines and recommendations can make in this regard;

Desiring to further the use of harmonized sanitary and phytosanitary measures between Members, on the basis of international standards, guidelines and recommendations developed by the relevant international organizations, including the Codex Alimentarius Commission, the International Office of Epizootics, and the relevant international and regional organizations operating within the framework of the International Plant Protection Convention, without requiring Members to change their appropriate level of protection of human, animal or plant life or health;

Recognizing that developing country Members may encounter special difficulties in complying with the sanitary or phytosanitary measures of importing Members, and as a consequence in access to markets, and also in the formulation and application of sanitary or phytosanitary measures in their own territories, and desiring to assist them in their endeavours in this regard;

Desiring therefore to elaborate rules for the application of the provisions of GATT 1994 which relate to the use of sanitary or phytosanitary measures, in particular the provisions of Article XX(b) ($\underline{1}$);

Hereby agree as follows:

Article 1 - General Provisions

- 1. This Agreement applies to all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade. Such measures shall be developed and applied in accordance with the provisions of this Agreement.
- 2. For the purposes of this Agreement, the definitions provided in Annex A shall apply.
- 3. The annexes are an integral part of this Agreement.

4. Nothing in this Agreement shall affect the rights of Members under the Agreement on Technical Barriers to Trade with respect to measures not within the scope of this Agreement.

Article 2 - Basic Rights and Obligations

- 1. Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement.
- 2. Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5.
- 3. Members shall ensure that their sanitary and phytosanitary measures do not arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail, including between their own territory and that of other Members. Sanitary and phytosanitary measures shall not be applied in a manner which would constitute a disguised restriction on international trade.
- 4. Sanitary or phytosanitary measures which conform to the relevant provisions of this Agreement shall be presumed to be in accordance with the obligations of the Members under the provisions of GATT 1994 which relate to the use of sanitary or phytosanitary measures, in particular the provisions of Article XX(b).

Article 3 - Harmonization

- 1. To harmonize sanitary and phytosanitary measures on as wide a basis as possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations, where they exist, except as otherwise provided for in this Agreement, and in particular in paragraph 3.
- 2. Sanitary or phytosanitary measures which conform to international standards, guidelines or recommendations shall be deemed to be necessary to protect human, animal or plant life or health, and presumed to be consistent with the relevant provisions of this Agreement and of GATT 1994.
- 3. Members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of sanitary or phytosanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations, if there is a scientific justification, or as a consequence of the level of sanitary or phytosanitary protection a Member determines to be appropriate in accordance with the relevant provisions of paragraphs 1 through 8 of Article 5.(2) Notwithstanding the above, all measures which result in a level of sanitary or phytosanitary protection different from that which would be achieved by measures based on international standards, guidelines or recommendations shall not be inconsistent with any other provision of this Agreement.
- 4. Members shall play a full part, within the limits of their resources, in the relevant international organizations and their subsidiary bodies, in particular the Codex Alimentarius Commission, the International Office of Epizootics, and the international and regional organizations operating within the framework of the International Plant Protection Convention, to promote within these organizations the development and periodic review of standards, guidelines and recommendations with respect to all aspects of sanitary and phytosanitary measures.
- 5. The Committee on Sanitary and Phytosanitary Measures provided for in paragraphs 1 and 4 of Article 12 (referred to in this Agreement as the "Committee") shall develop a procedure to monitor the process of international harmonization and coordinate efforts in this regard with the relevant international organizations.

Article 4 - Equivalence

- 1. Members shall accept the sanitary or phytosanitary measures of other Members as equivalent, even if these measures differ from their own or from those used by other Members trading in the same product, if the exporting Member objectively demonstrates to the importing Member that its measures achieve the importing Member's appropriate level of sanitary or phytosanitary protection. For this purpose, reasonable access shall be given, upon request, to the importing Member for inspection, testing and other relevant procedures.
- 2. Members shall, upon request, enter into consultations with the aim of achieving bilateral and multilateral agreements on recognition of the equivalence of specified sanitary or phytosanitary measures.

Article 5 - Assessment of Risk and Determination of the Appropriate Level of Sanitary or Phytosanitary Protection

- 1. Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations.
- 2. In the assessment of risks, Members shall take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases or pests; existence of pest or disease free areas; relevant ecological and environmental conditions; and quarantine or other treatment.
- 3. In assessing the risk to animal or plant life or health and determining the measure to be applied for achieving the appropriate level of sanitary or phytosanitary protection from such risk, Members shall take into account as relevant economic factors: the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks.
- 4. Members should, when determining the appropriate level of sanitary or phytosanitary protection, take into account the objective of minimizing negative trade effects.
- 5. With the objective of achieving consistency in the application of the concept of appropriate level of sanitary or phytosanitary protection against risks to human life or health, or to animal and plant life or health, each Member shall avoid arbitrary or unjustifiable distinctions in the levels it considers to be appropriate in different situations, if such distinctions result in discrimination or a disguised restriction on international trade. Members shall cooperate in the Committee, in accordance with paragraphs 1, 2 and 3 of Article 12, to develop guidelines to further the practical implementation of this provision. In developing the guidelines, the Committee shall take into account all relevant factors, including the exceptional character of human health risks to which people voluntarily expose themselves.
- 6. Without prejudice to paragraph 2 of Article 3, when establishing or maintaining sanitary or phytosanitary measures to achieve the appropriate level of sanitary or phytosanitary protection, Members shall ensure that such measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility.(3)
- 7. In cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other Members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time.

8. When a Member has reason to believe that a specific sanitary or phytosanitary measure introduced or maintained by another Member is constraining, or has the potential to constrain, its exports and the measure is not based on the relevant international standards, guidelines or recommendations, or such standards, guidelines or recommendations for such sanitary or phytosanitary measure may be requested and shall be provided by the Member maintaining the measure.

Article 6 - Adaptation to Regional Conditions, Including Pest — or Disease — Free Areas and Areas of Low Pest or Disease Prevalence

- 1. Members shall ensure that their sanitary or phytosanitary measures are adapted to the sanitary or phytosanitary characteristics of the area whether all of a country, part of a country, or all or parts of several countries from which the product originated and to which the product is destined. In assessing the sanitary or phytosanitary characteristics of a region, Members shall take into account, *inter alia*, the level of prevalence of specific diseases or pests, the existence of eradication or control programmes, and appropriate criteria or guidelines which may be developed by the relevant international organizations.
- 2. Members shall, in particular, recognize the concepts of pest or disease-free areas and areas of low pest or disease prevalence. Determination of such areas shall be based on factors such as geography, ecosystems, epidemiological surveillance, and the effectiveness of sanitary or phytosanitary controls.
- 3. Exporting Members claiming that areas within their territories are pest or diseasefree areas or areas of low pest or disease prevalence shall provide the necessary evidence thereof in order to objectively demonstrate to the importing Member that such areas are, and are likely to remain, pest— or disease—free areas or areas of low pest or disease prevalence, respectively. For this purpose, reasonable access shall be given, upon request, to the importing Member for inspection, testing and other relevant procedures.

Article 7 - Transparency

Members shall notify changes in their sanitary or phytosanitary measures and shall provide information on their sanitary or phytosanitary measures in accordance with the provisions of Annex B.

Article 8 - Control, Inspection and Approval Procedures

Members shall observe the provisions of Annex C in the operation of control, inspection and approval procedures, including national systems for approving the use of additives or for establishing tolerances for contaminants in foods, beverages or feedstuffs, and otherwise ensure that their procedures are not inconsistent with the provisions of this Agreement.

Article 9 - Technical Assistance

- 1. Members agree to facilitate the provision of technical assistance to other Members, especially developing country Members, either bilaterally or through the appropriate international organizations. Such assistance may be, *inter alia*, in the areas of processing technologies, research and infrastructure, including in the establishment of national regulatory bodies, and may take the form of advice, credits, donations and grants, including for the purpose of seeking technical expertise, training and equipment to allow such countries to adjust to, and comply with, sanitary or phytosanitary measures necessary to achieve the appropriate level of sanitary or phytosanitary protection in their export markets.
- 2. Where substantial investments are required in order for an exporting developing country Member to fulfil the sanitary or phytosanitary requirements of an importing

Member, the latter shall consider providing such technical assistance as will permit the developing country Member to maintain and expand its market access opportunities for the product involved.

Article 10 - Special and Differential Treatment

- 1. In the preparation and application of sanitary or phytosanitary measures, Members shall take account of the special needs of developing country Members, and in particular of the least-developed country Members.
- 2. Where the appropriate level of sanitary or phytosanitary protection allows scope for the phased introduction of new sanitary or phytosanitary measures, longer time-frames for compliance should be accorded on products of interest to developing country Members so as to maintain opportunities for their exports.
- 3. With a view to ensuring that developing country Members are able to comply with the provisions of this Agreement, the Committee is enabled to grant to such countries, upon request, specified, time-limited exceptions in whole or in part from obligations under this Agreement, taking into account their financial, trade and development needs.
- 4. Members should encourage and facilitate the active participation of developing country Members in the relevant international organizations.

Article 11 - Consultations and Dispute Settlement

- 1. The provisions of Articles XXII and XXIII of GATT 1994 as elaborated and applied by the Dispute Settlement Understanding shall apply to consultations and the settlement of disputes under this Agreement, except as otherwise specifically provided herein.
- 2. In a dispute under this Agreement involving scientific or technical issues, a panel should seek advice from experts chosen by the panel in consultation with the parties to the dispute. To this end, the panel may, when it deems it appropriate, establish an advisory technical experts group, or consult the relevant international organizations, at the request of either party to the dispute or on its own initiative.
- 3. Nothing in this Agreement shall impair the rights of Members under other international agreements, including the right to resort to the good offices or dispute settlement mechanisms of other international organizations or established under any international agreement.

Article 12 - Administration

- 1. A Committee on Sanitary and Phytosanitary Measures is hereby established to provide a regular forum for consultations. It shall carry out the functions necessary to implement the provisions of this Agreement and the furtherance of its objectives, in particular with respect to harmonization. The Committee shall reach its decisions by consensus.
- 2. The Committee shall encourage and facilitate ad hoc consultations or negotiations among Members on specific sanitary or phytosanitary issues. The Committee shall encourage the use of international standards, guidelines or recommendations by all Members and, in this regard, shall sponsor technical consultation and study with the objective of increasing coordination and integration between international and national systems and approaches for approving the use of food additives or for establishing tolerances for contaminants in foods, beverages or feedstuffs.
- 3. The Committee shall maintain close contact with the relevant international organizations in the field of sanitary and phytosanitary protection, especially with the Codex Alimentarius Commission, the International Office of Epizootics, and the Secretariat of the International Plant Protection Convention, with the objective of securing the best available scientific and technical advice for the administration of this Agreement and in order to ensure that unnecessary duplication of effort is avoided.

- 4. The Committee shall develop a procedure to monitor the process of international harmonization and the use of international standards, guidelines or recommendations. For this purpose, the Committee should, in conjunction with the relevant international organizations, establish a list of international standards, guidelines or recommendations relating to sanitary or phytosanitary measures which the Committee determines to have a major trade impact. The list should include an indication by Members of those international standards, guidelines or recommendations which they apply as conditions for import or on the basis of which imported products conforming to these standards can enjoy access to their markets. For those cases in which a Member does not apply an international standard, guideline or recommendation as a condition for import, the Member should provide an indication of the reason therefor, and, in particular, whether it considers that the standard is not stringent enough to provide the appropriate level of sanitary or phytosanitary protection. If a Member revises its position, following its indication of the use of a standard, guideline or recommendation as a condition for import, it should provide an explanation for its change and so inform the Secretariat as well as the relevant international organizations, unless such notification and explanation is given according to the procedures of Annex B.
- 5. In order to avoid unnecessary duplication, the Committee may decide, as appropriate, to use the information generated by the procedures, particularly for notification, which are in operation in the relevant international organizations.
- 6. The Committee may, on the basis of an initiative from one of the Members, through appropriate channels invite the relevant international organizations or their subsidiary bodies to examine specific matters with respect to a particular standard, guideline or recommendation, including the basis of explanations for non-use given according to paragraph 4.
- 7. The Committee shall review the operation and implementation of this Agreement three years after the date of entry into force of the WTO Agreement, and thereafter as the need arises. Where appropriate, the Committee may submit to the Council for Trade in Goods proposals to amend the text of this Agreement having regard, *inter alia*, to the experience gained in its implementation.

Article 13 - Implementation

Members are fully responsible under this Agreement for the observance of all obligations set forth herein. Members shall formulate and implement positive measures and mechanisms in support of the observance of the provisions of this Agreement by other than central government bodies. Members shall take such reasonable measures as may be available to them to ensure that non-governmental entities within their territories, as well as regional bodies in which relevant entities within their territories are members, comply with the relevant provisions of this Agreement. In addition, Members shall not take measures which have the effect of, directly or indirectly, requiring or encouraging such regional or nongovernmental entities, or local governmental bodies, to act in a manner inconsistent with the provisions of this Agreement. Members shall ensure that they rely on the services of nongovernmental entities for implementing sanitary or phytosanitary measures only if these entities comply with the provisions of this Agreement.

Article 14 - Final Provisions

The least-developed country Members may delay application of the provisions of this Agreement for a period of five years following the date of entry into force of the WTO Agreement with respect to their sanitary or phytosanitary measures affecting importation or imported products. Other developing country Members may delay application of the provisions of this Agreement, other than paragraph 8 of Article 5 and Article 7, for two years following the date of entry into force of the WTO Agreement with respect to their existing sanitary or phytosanitary measures affecting importation or imported products, where such application is prevented by a lack of technical expertise, technical infrastructure or resources.

			Set-up	and Ongoi	ing costs i	n Rs. '000
S N	Cost Components	Cost Sub-	OR	F01S	OR	Г02S
3 .IN.	Cost Components	headings	Set up	ongoing	Set up	ongoing
1	Traceability system	1	340.00	50.00	353.60	48.00
2	Document & record keeping & self-inspection	2	190.00	500.00	197.60	480.00
3	Site management	3	95.00		98.80	0.00
4	Risk assessments (revised annually)	4	100.00	50.00	104.00	48.00
5	Technical services	5	130.00	25.00	135.20	24.00
6	Laboratory analysis	6	250.00	160.00	260.00	153.60
7	Soil and substrate management	7	100.00	90.00	104.00	86.40
0	Fortilizer use	8.1	50.00	50.00	52.00	48.00
0	reitilizer use	8.2	50.00	15.00	52.00	14.40
		9.1	50.00	50.00	52.00	48.00
		9.2	150.00	50.00	156.00	48.00
		9.3	225.00	130.00	234.00	124.80
		9.4	30.00	30.00	31.20	28.80
0		9.5	500.00		520.00	0.00
9	Crop protection	9.6	1000.00	100.00	1040.00	96.00
		9.7	150.00	40.00	156.00	38.40
		9.8	200.00	30.00	208.00	28.80
		9.9	300.00	40.00	312.00	38.40
		9.1	450.00	50.00	468.00	48.00
		9.11	200.00	5.00	208.00	4.80
10	Irrigation/fertigation	10	150.00	25.00	156.00	24.00
		11.1	700.00	25.00	728.00	24.00
11	Harvesting & pruning	11.2	150.00	25.00	156.00	24.00
		11.3	300.00	300.00	312.00	288.00
		12.1	150.00	40.00	156.00	38.40
		12.2	5.00		5.20	0.00
12	Produce handling	12.3	250.00	50.00	260.00	48.00
12	r louice nandning	12.4	250.00	25.00	260.00	24.00
		12.5	550.00	25.00	572.00	24.00
		12.6	100.00	25.00	104.00	24.00
		13.1	150.00	25.00	156.00	24.00
13	Waste & pollution management, recycling and re-use	13.2	100.00		104.00	0.00
15	waste & ponution management, recycling and re-use	13.3	150.00	25.00	156.00	24.00
		13.4	150.00	25.00	156.00	24.00
		14.1	57.50	57.50	59.80	55.20
		14.2	57.50	57.50	59.80	55.20
		14.3	287.50	28.75	299.00	27.60
		14.4	862.50	172.50	897.00	165.60
		14.5	17.25	5.75	17.94	5.52
14	Worker health safety and welfare	14.6	34.50	11.50	35.88	11.04
14	worker health, safety and werfare	14.7	57.50	11.50	59.80	11.04
		14.8	57.50	17.25	59.80	16.56
		14.9	172.50	57.50	179.40	55.20
		14.1	57.50	46.00	59.80	44.16
		14.1	57.50	57.50	59.80	55.20
		14.1	1150.00	115.00	1196.00	110.40
		15.1	172.50	57.50	179.40	55.20
		15.2	115.00	46.00	119.60	44.16
15	Environmental issues	15.3	57.50	57.50	59.80	55.20
		15.4	46.00	46.00	47.84	44.16
		15.5	230.00	86.25	239.20	82.80
16	Certification	16	402.50	46.00	418.60	44.16
	ISO 2200 procedures PRP, OPRP, HACCP plan, &	17.1	34.50	5.75	35.88	5.52
17	other relevant document required by the ISO 22000:2005	17.2	0.00	34.50	0.00	33.12
		18.1	287.50	28.75	299.00	27.60
18	External communication	18.2	172.50	57.50	179.40	55.20
		18.3	28.75	28.75	29.90	27.60
		19.1	57.50	11.50	59.80	11.04
19	Internal communication	19.2	57.50	0.00	59.80	0.00
17		19.3	57.50	0.00	59.80	0.00

Appendix VI Components of SPS Compliance Costs of Sampled Tea Estates (Small Scale)

				36	ei-up ana	Ongoing	cosis in I	AS. 000
C N	Cost Components	C.H.	ORT	'03M	ORT	'04M	ORT	'05M
D.11.	Cost Components		Set up	ongoing	Set up	ongoing	Set up	ongoing
1	Traceability system	1	392.00	57.50	386.75	58.50	395.50	59.00
2	Document & record keeping & self-	2	224.00	(00.00	221.00	702.00	226.00	700.00
2	inspection	2	224.00	690.00	221.00	/02.00	226.00	/08.00
3	Site management	3	112.00		110.50		113.00	
4	Risk assessments (revised annually)	4	112.00	57 50	110.50	58 50	113.00	59.00
5	Technical services	5	168.00	28.75	165.75	29.25	169.50	29.50
6	Laboratory analysis	6	313.60	184.00	300.40	187.20	316.40	188.80
7	Soil and substrate management	7	140.00	115.00	138 13	117.00	141.25	118.00
/	Son and substrate management	× 1	74.80	76.00	74.20	76.80	75 20	77.20
8	Fertilizer use	8.1	74.00 56.00	17.25	55.25	17.55	56.50	17.20
		0.2	56.00	57.50	55.25	59.50	56.50	50.00
		9.1	30.00	57.50	33.23	58.50	30.30	59.00
		9.2	108.00	57.50	105.75	38.30	109.50	39.00
		9.5	252.00	172.50	248.03	1/5.50	254.25	177.00
		9.4	33.60	34.50	33.15	35.10	33.90	35.40
_		9.5	1008.00	0.00	994.50	0.00	1017.00	0.00
9	Crop protection	9.6	1420.00	415.00	1405.00	417.00	1430.00	418.00
		9.7	168.00	46.00	165.75	46.80	169.50	47.20
		9.8	224.00	34.50	221.00	35.10	226.00	35.40
		9.9	336.00	46.00	331.50	46.80	339.00	47.20
		9.1	504.00	57.50	497.25	58.50	508.50	59.00
		9.11	224.00	5.75	221.00	5.85	226.00	5.90
10	Irrigation/fertigation	10	201.60	28.75	198.90	29.25	203.40	29.50
		11.1	1008.00	28.75	994.50	29.25	1017.00	29.50
11	Harvesting & pruning	11.2	168.00	28.75	165.75	29.25	169.50	29.50
		11.3	336.00	345.00	331.50	351.00	339.00	354.00
		12.1	168.00	46.00	165.75	46.80	169.50	47.20
		12.2	5.60	0.00	5.53	0.00	5.65	0.00
		12.3	392.00	57.50	386.75	58.50	395.50	59.00
12	Produce handling	12.0	280.00	28.75	276.25	29.25	282.50	29.50
		12.4	616.00	28.75	607.75	29.25	621.50	29.50
		12.5	112.00	28.75	110.50	29.25	113.00	29.50
		12.0	168.00	28.75	165 75	29.25	169.50	29.50
	Waste & pollution management	13.1	112.00	20.75	110.50	0.00	113.00	27.50
13	receiping and re use	13.2	162.00	29.75	165 75	20.25	160.50	20.50
	recycling and re-use	13.3	168.00	20.75	165.75	29.25	169.50	29.50
		13.4	108.00	28.73	103.73	29.23	109.30	29.30
		14.1	89.00	69.00	88.40	70.20	90.40	70.80
		14.2	89.60	69.00	88.40	/0.20	90.40	/0.80
		14.3	364.00	46.00	359.13	46.80	367.25	47.20
		14.4	1008.00	184.00	994.50	187.20	1017.00	188.80
		14.5	16.80	5.75	16.58	5.85	16.95	5.90
14	Worker health, safety and welfare	14.6	33.60	11.50	33.15	11.70	33.90	11.80
	······································	14.7	56.00	11.50	55.25	11.70	56.50	11.80
		14.8	56.00	17.25	55.25	17.55	56.50	17.70
		14.9	168.00	57.50	165.75	58.50	169.50	59.00
		14.1	56.00	46.00	55.25	46.80	56.50	47.20
		14.1	56.00	57.50	55.25	58.50	56.50	59.00
		14.1	1120.00	115.00	1105.00	117.00	1130.00	118.00
		15.1	168.00	57.50	165.75	58.50	169.50	59.00
		15.2	112.00	46.00	110.50	46.80	113.00	47.20
15	Environmental issues	15.3	56.00	57.50	55.25	58.50	56.50	59.00
		15.4	44.80	46.00	44.20	46.80	45.20	47.20
		15.5	280.00	86.25	276.25	87.75	282.50	88.50
16	Certification	16	392.00	46.00	386.75	46.80	395.50	47.20
	ISO 2200 procedures PRP, OPRP,	17.1	33.60	5.75	33.15	5.85	33.90	5.90
17	HACCP plan, & other relevant document	17.0	0.00	24.50	0.00	25.10	0.00	25.40
	required by the ISO 22000:2005	17.2	0.00	34.50	0.00	35.10	0.00	35.40
		18.1	280.00	28.75	276.25	29.25	282.50	29.50
18	External communication	18.2	168.00	57.50	165.75	58.50	169.50	59.00
		18.3	28.00	28.75	27.63	29.25	28.25	29.50
		19.1	67.20	23.00	66 30	23.40	67.80	23.60
19	Internal communication	10.2	67.20	0.00	66.30	0.00	67.80	0.00
17		10.2	67.20	0.00	66 20	0.00	67.80	0.00
1		17.3	07.20	0.00	00.30	0.00	07.00	0.00

				Se	i-up unu	Unguing	cosis in	AS. 000
C N		O II	ORT	'06M	ORT	°07M	ORT	'08M
S.N.	Cost Components	С.н.	Set up	ongoing	Set up	ongoing	Set up	ongoing
1	Traceability system	1	385.00	56.90	399.00	56.00	392.70	57 10
-	Document & record keeping & self	-	505.00	50.70	377.00	50.00	372.10	57.10
2	inspection	2	220.00	682.80	228.00	672.00	224.40	685.20
	Inspection	2	110.00		114.00		110.00	
3	Site management	3	110.00		114.00		112.20	
4	Risk assessments (revised annually)	4	110.00	56.90	114.00	56.00	112.20	57.10
5	Technical services	5	165.00	28.45	171.00	28.00	168.30	28.55
6	Laboratory analysis	6	308.00	182.08	319.20	179.20	314.16	182.72
7	Soil and substrate management	7	137.50	113.80	142.50	112.00	140.25	114.20
		8.1	74.00	75.52	75.60	74.80	74.88	75.68
8	Fertilizer use	82	55.00	17.07	57.00	16.80	56 10	17.13
		0.2	55.00	56.90	57.00	56.00	56.10	57.10
		0.2	165.00	56.00	171.00	56.00	169.20	57.10
		9.2	247.50	170.70	256.50	169.00	252.45	37.10
		9.5	247.50	1/0./0	250.50	108.00	252.45	1/1.50
		9.4	33.00	34.14	34.20	33.60	33.66	34.26
		9.5	990.00	0.00	1026.00	0.00	1009.80	0.00
9	Crop protection	9.6	1400.00	413.80	1440.00	412.00	1422.00	414.20
		9.7	165.00	45.52	171.00	44.80	168.30	45.68
		9.8	220.00	34.14	228.00	33.60	224.40	34.26
		99	330.00	45 52	342.00	44 80	336.60	45.68
		0.1	495.00	56.90	513.00	56.00	504.90	57.10
		9.1	220.00	5.60	228.00	5.60	224.40	5 71
10	T	9.11	220.00	5.09	228.00	5.00	224.40	5./1
10	Irrigation/fertigation	10	198.00	28.45	205.20	28.00	201.96	28.55
		11.1	990.00	28.45	1026.00	28.00	1009.80	28.55
11	Harvesting & pruning	11.2	165.00	28.45	171.00	28.00	168.30	28.55
		11.3	330.00	341.40	342.00	336.00	336.60	342.60
		12.1	165.00	45.52	171.00	44.80	168.30	45.68
		12.2	5 50	0.00	5 70	0.00	5.61	0.00
		12.2	385.00	56.00	300.00	56.00	302.70	57.10
12	Produce handling	12.5	365.00	20.90	399.00	20.00	392.70	29.55
	_	12.4	275.00	28.45	285.00	28.00	280.50	28.55
		12.5	605.00	28.45	627.00	28.00	617.10	28.55
		12.6	110.00	28.45	114.00	28.00	112.20	28.55
		13.1	165.00	28.45	171.00	28.00	168.30	28.55
10	Waste & pollution management, recycling	13.2	110.00	0.00	114.00	0.00	112.20	0.00
13	and re-use	13.3	165.00	28.45	171.00	28.00	168.30	28.55
		13.4	165.00	28.45	171.00	28.00	168 30	28.55
		14.1	88.00	68.28	01 20	67.20	89.76	68.52
		14.1	88.00	69.20	01.20	67.20	80.76	69.52
		14.2	00.00	00.20	91.20	07.20	89.70	08.32
		14.3	357.50	45.52	370.50	44.80	364.65	45.68
		14.4	990.00	182.08	1026.00	179.20	1009.80	182.72
		14.5	16.50	5.69	17.10	5.60	16.83	5.71
14		14.6	33.00	11.38	34.20	11.20	33.66	11.42
14	worker health, safety and wellare	14.7	55.00	11.38	57.00	11.20	56.10	11.42
		14.8	55.00	17.07	57.00	16.80	56.10	17.13
		14.9	165.00	56.90	171.00	56.00	168 30	57.10
		14.7	55.00	15 50	57.00	11 00	56 10	15 60
		14.1	55.00	43.32	57.00	44.80	56.10	43.08
		14.1	55.00	56.90	57.00	56.00	56.10	57.10
		14.1	1100.00	113.80	1140.00	112.00	1122.00	114.20
		15.1	165.00	56.90	171.00	56.00	168.30	57.10
		15.2	110.00	45.52	114.00	44.80	112.20	45.68
15	Environmental issues	15.3	55.00	56.90	57.00	56.00	56.10	57.10
		15.4	44.00	45 52	45.60	44.80	44 88	45.68
		15.5	275.00	85.32	285.00	8/ 00	280.50	85.65
16	Contification	13.3	205.00	45 50	200.00	44.00	200.00	45.00
16		10	383.00	45.52	399.00	44.80	392.70	43.68
	ISO 2200 procedures PRP, OPRP,	17.1	33.00	5.69	34.20	5.60	33.66	5.71
17	HACCP plan, & other relevant document	17.2	0.00	34.14	0.00	33.60	0.00	34.26
	required by the ISO 22000:2005	17.2	0.00	54.14	0.00	55.00	0.00	54.20
		18.1	275.00	28.45	285.00	28.00	280.50	28.55
18	External communication	18.2	165.00	56.90	171.00	56.00	168.30	57.10
-		183	27 50	28.45	28.50	28.00	28.05	28.55
<u> </u>		10.5	66.00	20.45	68 /0	22.00	67 27	20.00
10	Internal communication	17.1	66.00	22.70	60.40	22.40	67.22	22.04
19	internal communication	19.2	00.00	0.00	08.40	0.00	07.32	0.00
1		19.3	66.00	0.00	68.40	0.00	67.32	0.00

				Se	i-up unu	Unguing	cosis in	<u>NS. 000</u>
G N		a u	ORT	`09M	ORT	'10M	ORT	'11M
S.N.	Cost Components	С.Н.	Set up	ongoing	Set up	ongoing	Set up	ongoing
1	Tracaability system	1	300 70	58 50	401 80	50.00	302.81	57.20
1		1	399.70	36.50	401.60	39.00	392.01	37.20
2	Document & record keeping & self-	2	228.40	702.00	229.60	708.00	224.46	686.40
-	inspection							
3	Site management	3	114.20		114.80		112.23	
4	Risk assessments (revised annually)	4	114.20	58.50	114.80	59.00	112.23	57.20
5	Technical services	5	171.30	29.25	172.20	29.50	168.35	28.60
6	Laboratory analysis	6	319.76	187.20	321.44	188.80	314.24	183.04
7	Soil and substrate management	7	142 75	117.00	143 50	118.00	140.29	114 40
,	bon und substrate management	81	75.68	76.80	75.02	77.20	7/ 80	75.76
8	Fertilizer use	0.1	57.10	17.55	57.40	17.20	56 10	17.16
		0.2	57.10	17.55	57.40	17.70	56.12	17.10
		9.1	57.10	58.50	57.40	59.00	56.12	57.20
		9.2	171.30	58.50	172.20	59.00	168.35	57.20
		9.3	256.95	175.50	258.30	177.00	252.52	171.60
		9.4	34.26	35.10	34.44	35.40	33.67	34.32
		9.5	1027.80	0.00	1033.20	0.00	1010.07	0.00
9	Crop protection	9.6	1442.00	417.00	1448.00	418.00	1422.30	414.40
-	crop protection	9.7	171.30	46.80	172.20	47.20	168 35	45.76
		0.8	228.40	35.10	220.60	35.40	224.46	34.32
		9.0	220.40	35.10	229.00	33.40	224.40	34.32
		9.9	342.60	46.80	344.40	47.20	336.69	45.76
		9.1	513.90	58.50	516.60	59.00	505.04	57.20
		9.11	228.40	5.85	229.60	5.90	224.46	5.72
10	Irrigation/fertigation	10	205.56	29.25	206.64	29.50	202.01	28.60
		11.1	1027.80	29.25	1033.20	29.50	1010.07	28.60
11	Harvesting & pruning	11.2	171 30	29.25	172.20	29.50	168 35	28.60
11	That vesting & prunning	11.2	342.60	351.00	344.40	354.00	336.60	20.00
		11.5	171.20	46.90	172.20	47.00	169.25	343.20
		12.1	1/1.30	46.80	172.20	47.20	108.35	45.70
		12.2	5.71	0.00	5.74	0.00	5.61	0.00
12	Produce handling	12.3	399.70	58.50	401.80	59.00	392.81	57.20
12	i iouuce hundring	12.4	285.50	29.25	287.00	29.50	280.58	28.60
		12.5	628.10	29.25	631.40	29.50	617.27	28.60
		12.6	114.20	29.25	114.80	29.50	112.23	28.60
		13.1	171.30	29.25	172.20	29.50	168 35	28.60
	Waste & pollution management requeling	13.1	114.20	0.00	114.80	0.00	112.23	0.00
13	waste & ponution management, recycling	13.2	171.20	0.00	172.00	0.00	112.23	0.00
	and re-use	13.3	1/1.30	29.25	172.20	29.50	168.35	28.60
		13.4	171.30	29.25	172.20	29.50	168.35	28.60
		14.1	91.36	70.20	91.84	70.80	89.78	68.64
		14.2	91.36	70.20	91.84	70.80	89.78	68.64
		14.3	371.15	46.80	373.10	47.20	364.75	45.76
		14.4	1027.80	187.20	1033.20	188.80	1010.07	183.04
		14.5	17.13	5.85	17.22	5.90	16.83	5 72
		14.5	24.26	11.70	24.44	11.20	22.67	11.44
14	Worker health, safety and welfare	14.0	54.20	11.70	54.44	11.00	55.07	11.44
		14.7	57.10	11.70	57.40	11.80	50.12	11.44
		14.8	57.10	17.55	57.40	17.70	56.12	17.16
		14.9	171.30	58.50	172.20	59.00	168.35	57.20
		14.1	57.10	46.80	57.40	47.20	56.12	45.76
		14.1	57.10	58.50	57.40	59.00	56.12	57.20
		14.1	1142.00	117.00	1148.00	118.00	1122.30	114.40
-		15.1	171 30	58 50	172.20	59.00	168 35	57.20
		15.1	11/ 20	16.90	11/ 2.20	17 20	112 22	15 76
1.5	E	15.2	57.10	40.00	57.40	47.20	56.12	43.70
15	Environmental issues	15.3	57.10	38.50	57.40	59.00	56.12	57.20
		15.4	45.68	46.80	45.92	47.20	44.89	45.76
		15.5	285.50	87.75	287.00	88.50	280.58	85.80
16	Certification	16	399.70	46.80	401.80	47.20	392.81	45.76
	ISO 2200 procedures PRP. OPRP.	17.1	34.26	5.85	34.44	5.90	33.67	5.72
17	HACCP plan. & other relevant document							
- '	required by the ISO 22000.2005	17.2	0.00	35.10	0.00	35.40	0.00	34.32
	104 and 07 and 100 22000.2005	191	285 50	20.25	287.00	20.50	280 20	28 60
10	E-4	10.1	203.30	29.2J	207.00	29.30	200.30	∠0.00 57.00
18	External communication	18.2	1/1.30	38.50	1/2.20	59.00	108.35	57.20
L		18.3	28.55	29.25	28.70	29.50	28.06	28.60
		19.1	68.52	23.40	68.88	23.60	67.34	22.88
19	Internal communication	19.2	68.52	0.00	68.88	0.00	67.34	0.00
.,		19.3	68.52	0.00	68.88	0.00	67.34	0.00

				Se	et-up and	Ongoing	z costs in .	KS. 1000
C N	Cost Components	СЦ	ORT	12M	ORT	13M	ORT	14M
9. IN.	Cost Components	С.п.	Set up	ongoing	Set up	ongoing	Set up	ongoing
1	Traceability system	1	392.70	57.10	470.40	69.00	479.57	69.03
2	Document & record keeping & self- inspection	2	224.40	685.20	268.80	828.00	274.04	828.36
3	Site management	3	112.20		134.40	0.00	137.02	0.00
4	Risk assessments (revised annually)	4	112.20	57.10	134.40	69.00	137.02	69.03
5	Technical services	5	168.30	28.55	201.60	34.50	205.53	34.52
6	Laboratory analysis		314.16	182.72	376.32	220.80	383.66	220.90
7	Soil and substrate management	7	140.25	114.20	168.00	138.00	171.28	138.06
8	Fertilizer use	8.1	74.88	75.68	89.76	91.20	92.01	90.62
		8.2	56.10	17.13	67.20	20.70	68.51	20.71
		9.1	168 30	57.10	201.60	69.00	205 53	69.03
		9.3	252.45	171.30	302.40	207.00	308.30	207.09
		9.4	33.66	34.26	40.32	41 40	41 11	41 42
		9.5	1009.80	0.00	1209.60	0.00	1233.18	0.00
9	Crop protection	9.6	1422.00	414.20	1704.00	498.00	1742.20	492.06
		9.7	168.30	45.68	201.60	55.20	205.53	55.22
		9.8	224.40	34.26	268.80	41.40	274.04	41.42
		9.9	336.60	45.68	403.20	55.20	411.06	55.22
		9.1	504.90	57.10	604.80	69.00	616.59	69.03
		9.11	224.40	5.71	268.80	6.90	274.04	6.90
10	Irrigation/fertigation	10	201.96	28.55	241.92	34.50	246.64	34.52
		11.1	1009.80	28.55	1209.60	34.50	1233.18	34.52
11	Harvesting & pruning	11.2	168.30	28.55	201.60	34.50	205.53	34.52
		11.3	336.60	342.60	403.20	414.00	411.06	414.18
		12.1	168.30	45.68	201.60	55.20	205.53	55.22
		12.2	5.61	0.00	6.72	0.00	6.85	0.00
12	Produce handling	12.3	392.70	57.10	4/0.40	69.00	4/9.57	69.03
		12.4	280.30	28.55	720.20	34.30	752.61	34.52
		12.5	112 20	28.55	134.40	34.50	137.02	34.52
		13.1	168.30	28.55	201.60	34.50	205.53	34.52
	Waste & pollution management, recycling	13.2	112.20	0.00	134.40	0.00	137.02	0.00
13	and re-use	13.3	168.30	28.55	201.60	34.50	205.53	34.52
		13.4	168.30	28.55	201.60	34.50	205.53	34.52
		14.1	89.76	68.52	99.46	75.90	99.01	78.27
		14.2	89.76	68.52	99.46	75.90	99.01	78.27
		14.3	364.65	45.68	404.04	50.60	402.22	52.18
		14.4	1009.80	182.72	1118.88	202.40	1113.84	208.73
		14.5	16.83	5.71	18.65	6.33	18.56	6.52
14	Worker health, safety and welfare	14.6	33.66	11.42	37.30	12.65	37.13	13.05
	, .	14.7	56.10	11.42	62.16	12.65	61.88	13.05
		14.8	30.10	17.13	02.10	18.98	01.88	19.5/
		14.9	56 10	J1.10	62 16	50.60	61.99	52.19
		14.1 14.1	56.10	57 10	62.10	63.25	61.88	65.23
		14.1	1122.00	114 20	1243 20	126 50	1237.60	130.46
		15.1	168.30	57.10	186.48	63.25	185.64	65.23
		15.2	112.20	45.68	124.32	50.60	123.76	52.18
15	Environmental issues	15.3	56.10	57.10	62.16	63.25	61.88	65.23
		15.4	44.88	45.68	49.73	50.60	49.50	52.18
		15.5	280.50	85.65	310.80	94.88	309.40	97.84
16	Certification	16	392.70	45.68	435.12	50.60	433.16	52.18
	ISO 2200 procedures PRP, OPRP,	17.1	33.66	5.71	37.30	6.33	37.13	6.52
17	HACCP plan, & other relevant document required by the ISO 22000:2005	17.2	0.00	34.26	0.00	37.95	0.00	39.14
		18.1	280.50	28.55	310.80	31.63	309.40	32.61
18	External communication	18.2	168.30	57.10	186.48	63.25	185.64	65.23
		18.3	28.05	28.55	31.08	31.63	30.94	32.61
10		19.1	67.32	22.84	74.59	25.30	74.26	26.09
19	Internal communication	19.2	67.32	0.00	74.59	0.00	74.26	0.00
1		19.3	67.32	0.00	/4.59	0.00	/4.26	0.00

			Set-up c	ind Ongo	ing costs i	n Rs. '000
SN	Cost Components	C.H.	OR	Г15І	OR	Г16І
3. 14.	Cost Components		Set up	ongoing	Set up	ongoing
1	Traceability system	1	599.76	193.20	611.45	193.28
2	Document & record keeping & self-inspection	2	342.72	2318.40	349.40	2319.41
3	Site management	3	171.36	0.00	174.70	0.00
4	Risk assessments (revised annually)	4	171.36	193.20	174.70	193.28
5	Technical services	5	257.04	96.60	262.05	96.64
6	Laboratory analysis	6	479.81	618.24	489.16	618.51
7	Soil and substrate management	7	214.20	386.40	218.38	386.57
0		8.1	114.44	255.36	117.31	253.75
8	Fertilizer use	8.2	85.68	57.96	87.35	57.99
		9.1	85.68	193.20	87.35	193.28
		9.2	257.04	193.20	262.05	193.28
		9.3	385.56	579.60	393.08	579.85
		9.4	51.41	115.92	52.41	115.97
		9.5	1542.24	0.00	1572.30	0.00
9	Crop protection	9.6	2172.60	1394.40	2221.31	1377.77
-		9.7	257.04	154.56	262.05	154.63
		9.8	342.72	115.92	349.40	115.97
		9.9	514.08	154.56	524.10	154.63
		9.1	771.12	193.20	786.15	193.28
		9.11	342.72	19.32	349.40	19.33
10	Irrigation/fertigation	10	308.45	96.60	314.46	96.64
-		11.1	1542.24	96.60	1572.30	96.64
11	Harvesting & pruning	11.2	257.04	96.60	262.05	96.64
	The fosting of proming	11.3	514.08	1159.20	524.10	1159.70
		12.1	257.04	154.56	262.05	154.63
		12.2	8.57	0.00	8.74	0.00
		12.3	599.76	193.20	611 45	193.28
12	Produce handling	12.3	428.40	96.60	436.75	96.64
		12.5	942.48	96.60	960.85	96.64
		12.6	171.36	96.60	174.70	96.64
		13.1	257.04	96.60	262.05	96.64
		13.2	171.36	0.00	174.70	0.00
13	Waste & pollution management, recycling and re-use	13.3	257.04	96.60	262.05	96.64
		13.4	257.04	96.60	262.05	96.64
		14.1	126.81	212.52	126.24	219.16
		14.2	126.81	212.52	126.24	219.16
		14.3	515.15	141.68	512.83	146.11
		14.4	1426 57	566.72	1420.15	584.44
		14.4	23.78	17.71	23.67	18.26
		14.6	47.55	35.42	47.34	36.53
14	Worker health, safety and welfare	14.7	79.25	35.42	78.90	36.53
		14.7	79.25	53.13	78.90	54.79
		14.0	237.76	177.10	236.69	182.64
		14.1	79.25	141.68	78 90	146.11
		14.1	79.25	177 10	78.90	182.64
		14.1	1585.08	354.20	1577 94	365.27
<u> </u>		15.1	237 76	177.10	236.69	182.64
		15.1	158 51	141.68	157 79	146 11
15	Environmental issues	15.2	79.25	177 10	78.90	182.64
1.5	La montentar issues	15.5	63.40	141.68	63.12	146 11
		15.5	396 27	265.65	394 49	273.96
16	Certification	15.5	554 78	141.68	552.28	146.11
10	ISO 2200 procedures PRP OPRP H ΔCCP plan $\&$	17.1	47 55	17 71	47 34	18.26
17	other relevant document required by the ISO	17.1	-1.55	1/./1	-1.34	10.20
17	22000:2005	17.2	0.00	106.26	0.00	109.58
		18.1	396.27	88.55	394.49	91.32
18	External communication	18.2	237.76	177.10	236.69	182.64
		18.3	39.63	88.55	39.45	91.32
		19.1	95.10	70.84	94.68	73.05
19	Internal communication	19.2	95.10	0.00	94.68	0.00
1		19.3	95.10	0.00	94.68	0.00
1			/2.10	0.00	2	0.00

Components of SPS Compliance Costs of Sampled Tea Estates (Large Scale)

	Components of S1 S Compnance Cost	s of Samp			aige sea		
			Set-up	and Ongo	oing costs in Rs. '00		
S.N.	Cost Components	C.H.	OR	F17I	OR'	F18I	
511.0		enn	Set up	ongoing	Set up	ongoing	
1	Traceability system	1	615.20	193.28	584.14	190.39	
2	Document & record keeping & self-inspection	2	351.54	2319.41	333.80	2284.65	
3	Site management	3	175.77	0.00	166.90	0.00	
4	Risk assessments (revised annually)	4	175.77	193.28	166.90	190.39	
5	Technical services	5	263.66	96.64	250.35	95.19	
6	Laboratory analysis	6	492.16	618.51	467.31	609.24	
7	Soil and substrate management	7	219.71	386 57	208.62	380.77	
,		81	116.07	252.91	112.28	252.69	
8	Fertilizer use	8.1	87.80	57.00	83.45	57.12	
		0.1	87.89	102.29	83.4J 92.45	100.20	
		9.1	07.09	193.20	05.45	190.39	
		9.2	203.00	193.28	250.55	190.39	
		9.3	395.49	579.85	375.52	5/1.16	
		9.4	52.73	115.97	50.07	114.23	
		9.5	1581.94	0.00	1502.08	0.00	
9	Crop protection	9.6	2224.37	1369.37	2124.15	1384.57	
		9.7	263.66	154.63	250.35	152.31	
		9.8	351.54	115.97	333.80	114.23	
		9.9	527.31	154.63	500.69	152.31	
		9.1	790.97	193.28	751.04	190.39	
		9.11	351 54	1933	333.80	19.04	
10	Irrigation/fartigation	10	216.20	06.64	300.42	05.10	
10		10	1591.04	90.04	1502.09	95.19	
		11.1	1581.94	96.64	1502.08	95.19	
11	Harvesting & pruning	11.2	263.66	96.64	250.35	95.19	
		11.3	527.31	1159.70	500.69	1142.32	
		12.1	263.66	154.63	250.35	152.31	
		12.2	8.79	0.00	8.34	0.00	
10	Droduce handling	12.3	615.20	193.28	584.14	190.39	
12		12.4	439.43	96.64	417.24	95.19	
		12.5	966.74	96.64	917.94	95.19	
		12.6	175.77	96.64	166.90	95.19	
		13.1	263.66	96.64	250.35	95.19	
	Waste & pollution management recycling and	13.2	175 77	0.00	166.90	0.00	
13	re-use	13.2	263.66	06.64	250.35	0.00	
	ic-use	13.5	263.00	90.04	250.35	95.19	
		13.4	203.00	90.04	230.33	95.19	
		14.1	125.80	221.45	124.09	216.04	
		14.2	125.86	221.43	124.09	216.04	
		14.3	511.32	147.62	504.13	144.03	
		14.4	1415.97	590.49	1396.05	576.10	
		14.5	23.60	18.45	23.27	18.00	
14	Worker health, safety and welfare	14.6	47.20	36.91	46.53	36.01	
14	worker health, safety and wenale	14.7	78.66	36.91	77.56	36.01	
		14.8	78.66	55.36	77.56	54.01	
		14.9	235.99	184.53	232.67	180.03	
		14.1	78.66	147.62	77.56	144.03	
		14.1	78.66	184.53	77.56	180.03	
		14.1	1573 30	369.06	1551 17	360.06	
		15.1	235.00	18/ 53	232.67	180.00	
		15.1	157.22	104.33	155 10	144.02	
15	Environmental inc	15.2	137.33	147.02	133.12	144.03	
15	Environmental issues	15.3	/8.66	184.53	//.56	180.03	
		15.4	62.93	147.62	62.05	144.03	
		15.5	393.32	276.79	387.79	270.05	
16	Certification	16	550.65	147.62	542.91	144.03	
	ISO 2200 procedures PRP, OPRP, HACCP	17.1	47.20	18.45	46.53	18.00	
17	plan, & other relevant document required by the	17.2	0.00	110 72	0.00	108.02	
	ISO 22000:2005	17.2	0.00	110.72	0.00	100.02	
		18.1	393.32	92.26	387.79	90.02	
18	External communication	18.2	235.99	184.53	232.67	180.03	
		18.3	39.33	92.26	38.78	90.02	
		19.1	94.40	73.81	93.07	72.01	
19	Internal communication	19.2	94.40	0.00	93.07	0.00	
		19.3	94.40	0.00	93.07	0.00	
		17.5	77.70	0.00	/0.07	0.00	

Components of SPS Compliance Costs of Sampled Tea Estates (Large Scale)

Appendix VII

Eirm	Convent	tional Qual	ity Cost	SP	S Quality (Cost	Total Cost	Output
гпш	SCC	OCC	Total	SCQ	OCQ	Total	Total Cost	Output
ORT01S	7715.00	2080.00	9795.00	4588.50	1144.25	5732.75	15527.75	100
ORT02S	8023.60	1996.80	10020.40	4772.04	1098.48	5870.52	15890.92	110
ORT03M	9889.20	2860.00	12749.20	4877.60	1207.50	6085.10	18834.30	200
ORT04M	9761.18	2904.00	12665.18	4812.28	1228.50	6040.78	18705.95	240
ORT05M	9974.55	2926.00	12900.55	4921.15	1239.00	6160.15	19060.70	250
ORT06M	9718.50	2833.60	12552.10	4790.50	1194.90	5985.40	18537.50	250
ORT07M	10059.90	2794.00	12853.90	4964.70	1176.00	6140.70	18994.60	250
ORT08M	9906.27	2842.40	12748.67	4886.31	1199.10	6085.41	18834.08	250
ORT09M	10076.97	2904.00	12980.97	4973.41	1228.50	6201.91	19182.88	250
ORT10M	10128.18	2926.00	13054.18	4999.54	1239.00	6238.54	19292.72	250
ORT11M	9908.83	2846.80	12755.63	4887.62	1201.20	6088.82	18844.45	250
ORT12M	9906.27	2842.40	12748.67	4886.31	1199.10	6085.41	18834.08	300
ORT13M	11867.04	3432.00	15299.04	5414.14	1328.25	6742.39	22041.43	320
ORT14M	12103.86	3426.72	15530.58	5389.75	1369.78	6759.53	22290.10	400
ORT15I	15130.48	9609.60	24740.08	6903.02	3719.10	10622.12	35362.20	1000
ORT16I	15432.42	9594.82	25027.23	6871.93	3835.38	10707.31	35734.54	1000
ORT17I	15515.41	9585.58	25100.99	6851.72	3875.10	10726.81	35827.80	1000
ORT18I	14745.39	9481.23	24226.62	6755.32	3780.66	10535.99	34762.61	1000

Quality Compliance Cost of Sampled Tea Estate

Appendix VIII

Perceived Benefit of ISO22000 of Sampled Tea Estate

1=Very High 5= Very Low Relevance

Firm	Benefit Components (BC)											Gent
Firm	BC 1	BC 2	BC 3	BC 4	BC 5	BC 6	BC 7	BC 8	BC 9	BC 10	BC 11	Cost
ORT01S	3	3	3	1	2	2	3	3	3	1	4	15527.75
ORT02S	2	3	2	2	2	3	2	4	3	3	5	15890.92
ORT03M	2	2	2	1	1	3	2	3	4	· 2	4	18834.30
ORT04M	3	2	3	1	2	2	2	3	3	2	5	18705.95
ORT05M	2	2	2	2	2	3	3	3	5	2	4	19060.70
ORT06M	2	2	2	1	2	3	2	3	3	3	5	18537.50
ORT07M	2	2	2	1	1	2	2	3	4	- 2	5	18994.60
ORT08M	2	2	1	1	2	3	3	3	3	2	4	18834.08
ORT09M	2	2	2	1	2	3	2	2	3	2	5	19182.88
ORT10M	2	2	3	1	2	2	3	3	4	- 2	4	19292.72
ORT11M	3	2	2	1	2	3	2	3	3	3	5	18844.45
ORT12M	2	3	2	2	1	2	2	3	4	- 2	5	18834.08
ORT13M	3	2	2	1	2	3	2	3	3	2	4	22041.43
ORT14M	2	2	3	1	2	3	3	3	3	2	4	22290.10
ORT15I	3	1	2	1	2	3	2	2	3	3	5	35362.20
ORT16I	2	2	2	2	1	2	1	3	3	2	5	35734.54
ORT17I	4	2	3	1	3	3	2	3	4	- 2	4	35827.80
ORT18I	2	2	2	1	2	1	2	3	3	2	5	34762.61

Where,

BC 1 Increased ability to retain existing customers

BC 2 Reduced product microbial counts

BC 3 Increased product sales

BC 4 Increased ability to access new export markets

BC 5 Increased ability to attract new customers

BC 6 Reduced product wastage

BC 7 Increased product shelf-life

BC 8 Increased motivation of production staff

BC 9 Increased motivation of supervisory staff

BC 10 Increased product prices

BC 11 Reduced production costs

Note: The Scale of firms is categorized into three groups viz. Small Scale, Medium Scale, and Large Scale

on the basis of their exportable products and volumes. Those firms which exports upto 100000 kg per year has been kept under small scale, 100001 to 400000 kg under medium scale, and above than 400000 kg under large scale.

Appendix IX

								1=Ver	y Higl	h $5 = Ve$	ery Low	Relevance
	Constraint Component											
Firms	CC1	CC2	CC3	CC4	CC5	CC6	CC7	CC8	CC9	CC10	CC11	Output
ORT01S	1	1	2	1	4	1	1	3	2	2	5	100
ORT02S	1	2	1	1	4	2	1	3	3	2	4	110
ORT03M	2	1	3	3	3	1	1	3	3	3	5	200
ORT04M	2	1	1	2	3	2	1	4	4	3	5	240
ORT05M	3	2	3	1	4	1	1	3	4	3	5	250
ORT06M	2	1	3	3	3	2	1	4	3	3	5	250
ORT07M	2	2	2	3	4	1	1	3	3	2	5	250
ORT08M	3	1	3	1	4	1	1	3	3	4	5	250
ORT09M	2	1	2	2	2	1	1	3	3	3	5	250
ORT10M	2	2	3	3	3	2	2	4	4	3	5	250
ORT11M	2	1	2	2	4	1	1	3	3	3	5	250
ORT12M	3	1	3	3	4	1	1	3	3	3	5	300
ORT13M	2	2	3	3	3	1	2	3	3	3	5	320
ORT14M	3	1	3	2	4	3	1	4	4	3	5	400
ORT15I	2	1	3	3	2	3	2	3	3	4	5	1000
ORT16I	2	3	2	3	2	1	1	3	3	3	5	1000
ORT17I	3	1	3	3	4	1	1	5	5	3	5	1000
ORT18I	2	1	3	2	2	1	2	3	3	4	5	1000

Perceived SPS Difficulties Rank of Sampled Tea Estate

Where,

CC1 Internal budgetary constraint

Difficulties in obtaining external funding CC2

CC3 Reduced staff time available for other tasks

Training/motivation of production/supervisory staff Difficulties of getting advise CC4

CC5

Reliable raw material supplier CC6

Recouping costs of implementing ISO 22000:2005 or other quality standard system Reduced flexibility to introduce new products CC7

CC8

Reduced flexibility of production process CC9

CC10 Reduced flexibility of production staff

Uncertainty about potential benefits from ISO 22000:2005 or other quality standard system CC11

Appendix X

Perceived Constraining Factors Rank of Sampled Tea Estate

1=Very High 5= Very Low Relevance

Constraining Factors															
Firm	CF1	CF2	CF3	CF4	CF5	CF6	CF7	CF8	CF9	CF10	CF11	CF12	CF13	CF14	Output
ORT01S	1	1	1	2	1	3	1	1	3	1	1	1	1	1	100
ORT02S	1	1	1	1	2	2	2	1	3	2	2	1	1	1	110
ORT03M	1	1	2	1	1	3	1	1	2	1	1	1	1	1	200
ORT04M	1	2	1	3	1	4	1	1	2	1	1	2	2	1	240
ORT05M	1	1	1	2	1	3	1	1	4	2	2	1	1	1	250
ORT06M	2	1	1	1	2	3	2	1	2	1	1	2	2	1	250
ORT07M	1	2	2	1	1	3	1	1	3	2	2	1	2	1	250
ORT08M	1	1	1	2	1	2	1	1	2	1	3	1	1	1	250
ORT09M	1	2	1	1	1	4	1	2	2	3	1	1	1	1	250
ORT10M	1	1	1	1	2	3	1	1	3	2	2	1	2	1	250
ORT11M	1	1	1	2	1	3	1	1	2	1	1	2	1	1	250
ORT12M	1	2	2	1	1	4	1	1	2	1	1	1	2	1	300
ORT13M	2	1	1	1	2	3	2	1	3	3	3	1	3	2	320
ORT14M	1	1	2	1	1	3	1	3	2	1	1	2	1	1	400
ORT15I	1	2	1	1	3	4	3	1	2	1	3	1	1	1	1000
ORT16I	1	1	1	2	1	3	1	1	4	2	1	1	1	2	1000
ORT17I	2	3	3	3	1	3	1	1	2	3	2	1	3	1	1000
ORT18I	3	1	3	1	3	4	1	1	4	1	4	1	3	1	1000

Where,

- CF1 Cost and quality of tea inputs
- Cost of processing CF2
- CF3
- Transport Credit/Capital CF4
- Cost of doing business CF5
- Overall product quality CF6
- CF7
- Consistency of product quality Compliance with food safety requirements CF8
- CF9 Compliance with environmental requirements
- CF10 Value added
- CF11 Difficulties to entry and exit
- CF12 Bureaucracy
- CF13 Government regulations
- CF14 Lack of government support

Appendix XI

Perceived Food Safety-Related Quality Issues Constraining the Nepalese Tea Industry from Attaining Higher level of export

						1=Ver	y High	5= Very	Low	Relevance			
perceived foo	d safety	-related	d qualit	y issues	constra	ining th	ne Nepa	lese Tea	ind	ustry from			
		1	attainin	g a high	er level	of expo	ort						
	Constraint Components												
Firm	CC1	CC2	CC3	CC4	CC5	CC6	CC7	CC8		Output			
ORT01S		3	1	1	2	2	1	2	3	100			
ORT02S		2	2	1	2	2	2	1	2	110			
ORT03M		1	2	1	3	2	1	1	1	200			
ORT04M		3	2	1	2	3	2	2	2	240			
ORT05M		1	1	1	3	2	2	1	1	250			
ORT06M		2	3	1	2	3	1	2	1	250			
ORT07M		3	2	1	3	2	2	1	2	250			
ORT08M		1	1	1	2	2	3	1	1	250			
ORT09M		2	2	2	2	4	1	1	3	250			
ORT10M		1	1	1	2	3	1	1	3	250			
ORT11M		2	1	3	4	2	1	1	1	250			
ORT12M		2	3	1	2	4	2	1	3	300			
ORT13M		3	1	1	3	2	1	2	1	320			
ORT14M		1	1	2	2	4	3	1	2	400			
ORT15I		1	3	1	4	2	1	3	1	1000			
ORT16I		2	1	1	3	2	2	1	1	1000			
ORT17I		3	1	2	2	3	1	1	3	1000			
ORT18I		1	3	1	5	2	3	3	3	1000			

Where,

CC1 Food industry's trust in the food safety regulatory body

CC2 Government's food safety regulatory systems

CC3 Cost of compliance

CC4 Traceability system

CC5 Monitoring and surveillance systems

CC6 Industry's current adoption of food safety systems

CC7 Culture of food safety among firms in the industry

CC8 Culture of product quality among firms in the industry
Appendix XII

					1	=Very H	ligh 5=	Very Lo	w Relevance				
		Policy Constraint											
Firm	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	Output				
ORT01S	2	1	1	5	1	3	1	3	100				
ORT02S	1	1	1	4	1	2	1	2	110				
ORT03M	2	1	1	2	2	2	1	1	200				
ORT04M	3	2	1	3	1	3	1	3	240				
ORT05M	3	1	2	2	1	2	1	2	250				
ORT06M	2	2	1	4	2	2	1	1	250				
ORT07M	1	1	1	2	1	3	1	1	250				
ORT08M	1	1	2	3	2	2	1	1	250				
ORT09M	2	2	1	2	3	2	1	1	250				
ORT10M	1	1	2	4	1	3	1	1	250				
ORT11M	3	1	1	2	2	2	1	1	250				
ORT12M	3	2	1	3	1	2	2	1	300				
ORT13M	1	1	2	2	2	4	1	1	320				
ORT14M	2	3	1	3	1	2	1	1	400				
ORT15I	3	1	1	2	3	2	2	1	1000				
ORT16I	1	3	1	4	1	2	1	1	1000				
ORT17I	3	1	1	3	1	4	2	1	1000				
ORT18I	1	1	1	2	3	2	2	1	1000				

Policy Constraint of SPS Constraints Nepalese Tea Industry from Attaining Higher Level of Export

Where,

PC1 Administrative regulations; bureaucracy in the public sector

PC2 Trade policy

PC3 Export promotion policy

PC4 Macroeconomic policy

PC5 Food safety policy and regulation

PC6 Tax system's impact on investment and risk-taking

PC7 Investment in infrastructure

PC8 Labor policy

Appendix XIII

Trade, Tax and GDP at Current Price

E/Marsh	Trade Volume					GDP						
F/Year	Import	Export	Total	Export	Imports	I E R	Misc	Trade ¹	Non-trade	Total	at cp	Deflator ²
1974-75	1814.6	889.6	2704.2	30.890	182.299	107.721	7.612	328.522	513.254	841.776	16601.00	12.909
1975-76	1981.7	1185.8	3167.5	37.717	204.474	112.041	4.264	358.496	552.363	910.859	17394.00	12.978
1976-77	2008.0	1164.7	3172.7	47.620	215.704	117.400	5.469	386.193	713.865	1100.058	17280.30	12.516
1977-78	2469.6	1046.2	3515.8	38.716	334.083	85.360	0.621	458.780	785.015	1243.795	19727.00	13.690
1978-79	2884.7	1296.8	4181.5	54.397	535.762	35.955	0.600	626.714	850.120	1476.834	26128.00	15.055
1979-80	3480.1	1150.5	4630.6	62.639	504.791	39.525	1.058	608.013	920.706	1528.719	23351.00	16.200
1980-81	4428.2	1608.7	6036.9	69.457	685.140	58.146	3.095	815.838	1219.886	2035.724	27307.00	17.486
1981-82	4930.3	1491.5	6421.8	42.153	739.536	40.437	3.018	825.144	1386.221	2211.365	30988.00	19.122
1982-83	6314.0	1132.0	7446.0	25.099	714.815	20.023	0.978	760.915	1660.228	2421.143	33821.00	21.471
1983-84	6514.3	1703.9	8218.2	30.358	746.158	49.024	0.328	825.868	1911.110	2736.978	39290.00	22.841
1984-85	7742.1	2740.6	10482.7	55.682	907.567	99.980	1.153	1064.382	2086.496	3150.878	46587.03	24.265
1985-86	9341.2	3078.1	12419.3	73.343	1081.129	75.639	0.993	1231.104	2428.363	3659.467	55734.31	27.761
1986-87	10905.2	2991.4	13896.6	79.927	1285.332	138.318	2.123	1505.700	2866.697	4372.397	63864.50	31.279
1987-88	13869.6	4114.5	17984.1	107.901	1984.230	121.222	1.349	2214.702	3539.703	5754.405	76906.12	35.039
1988-89	16263.7	4195.3	20459.0	62.657	2133.937	91.617	1.710	2289.921	3997.343	6287.264	89269.62	39.019
1989-90	18324.9	5156.2	23481.1	32.560	2645.982	0.000	6.331	2684.873	4599.069	7283.942	103415.83	43.213
1990-91	23226.5	7387.5	30614.0	78.466	2752.660	211.616	1.540	3044.282	5132.055	8176.337	120370.27	47.193
1991-92	31940.0	13706.5	45646.5	114.694	2795.166	447.466	1.562	3358.888	6516.680	9875.568	149487.14	56.148
1992-93	39205.6	17266.5	56472.1	140.672	3178.059	623.454	2.801	3944.986	7717.530	11662.516	171473.89	62.260
1993-94	51570.8	19293.4	70864.2	427.003	4356.049	460.399	11.591	5255.042	10116.417	15371.459	199272.00	66.596
1994-95	63679.5	17639.2	81318.7	332.467	5815.870	837.481	32.294	7018.112	12641.960	19660.072	219175.00	71.073
1995-96	74454.5	19881.1	94335.6	149.902	6246.451	899.888	31.123	7327.364	14340.603	21667.967	248913.00	76.688
1996-97	93553.4	22636.5	116189.9	167.841	7093.201	1009.091	38.986	8309.119	16115.134	24424.253	280513.00	82.232
1997-98	89002.0	27513.5	116515.5	217.133	7019.413	1102.011	163.677	8502.234	17437.584	25939.818	300845.00	85.501
1998-99	87525.3	35676.3	123201.6	378.003	7698.278	1205.993	235.400	9517.674	19235.261	28752.935	342036.00	93.177
1999-00	108504.9	49822.7	158327.6	432.485	8959.897	1331.722	89.200	10813.304	22338.877	33152.181	379488.00	97.441
2000-01	115687.2	55654.1	171341.3	492.602	10391.864	1456.238	211.400	12552.104	26312.898	38865.002	441519.01	100.000
2001-02	107388.9	46944.8	154333.7	917.378	9678.362	1700.898	362.100	12658.738	26671.850	39330.588	459442.81	103.900
2002-03	124352.1	49930.6	174282.7	855.648	10567.676	2370.609	442.500	14236.433	28350.502	42586.935	492231.28	107.100
2003-04	136277.1	53910.7	190187.8	527.075	10666.900	3882.700	478.100	15554.775	32618.225	48173.000	536748.88	111.400
2004-05	149473.6	58705.7	208179.3	697.899	12299.100	2188.300	516.300	15701.599	38403.101	54104.700	589411.55	118.000
2005-06	173780.3	60234.1	234014.4	625.600	11744.600	2314.400	659.400	15344.000	42086.400	57430.400	654084.00	126.200
2006-07	194694.6	59383.1	254077.7	708.700	13626.100	1896.500	476.300	16707.600	54419.100	71126.700	727827.00	135.400
2007-08	221937.7	59266.5	281204.2	445.600	17128.200	2997.100	491.600	21062.500	64093.000	85155.500	815658.00	142.900
2008-09	284469.6	67697.5	352167.1	796.400	22056.600	3211.100	728.800	26792.900	90259.000	117051.900	988053.00	165.900
2009-10	374335.2	60824.0	435159.2	915.400	29955.200	3521.000	759.200	35150.800	121144.100	156294.900	1171905.00	186.400

Rs. In Million except GDP Deflator

Source: Ministry of Finance (various years) Economic Surve y⁴Trade tax includes import, export, IER, and Miscellaneous (Misc) taxes ²Base year of Real GDP is 2000-01

Appendix XIV

Trade, Tax and GDP at Constant Price

DAV	Trade Volume				GDP	,	DODODD						
F/Year	Import	Export	Total	Export	Import	I E R	Misc	Trade ¹	Non-trade	Total	Real	Popn	PCRGDP
1974-75	14057.17	6891.47	20948.63	239.30	1412.22	834.48	58.97	2544.96	3976.03	6520.99	128603.00	13.04	9862.19
1975-76	15269.19	9136.70	24405.89	290.61	1575.49	863.29	32.85	2762.25	4256.01	7018.25	134022.41	13.36	10031.62
1976-77	16043.09	9305.47	25348.56	380.46	1723.39	937.98	43.70	3085.52	5703.49	8789.01	138062.43	13.68	10092.28
1977-78	18039.84	7642.24	25682.09	282.81	2440.40	623.53	4.54	3351.28	5734.35	9085.63	144101.07	14.01	10285.59
1978-79	19160.52	8613.50	27774.01	361.31	3558.59	238.82	3.99	4162.71	5646.60	9809.31	173545.25	14.35	12093.75
1979-80	21481.51	7101.66	28583.17	386.65	3115.91	243.97	6.53	3753.06	5683.21	9436.28	144138.03	14.70	9805.31
1980-81	25324.04	9199.85	34523.89	397.21	3918.19	332.53	17.70	4665.62	6976.30	11641.92	156163.58	15.06	10369.43
1981-82	25783.81	7800.04	33583.86	220.45	3867.53	211.47	15.78	4315.23	7249.47	11564.70	162056.84	15.42	10509.52
1982-83	29407.01	5272.21	34679.22	116.90	3329.20	93.26	4.55	3543.91	7732.39	11276.30	157518.91	15.80	9969.55
1983-84	28520.59	7459.93	35980.53	132.91	3266.79	214.63	1.44	3615.78	8367.13	11982.91	172017.58	16.18	10631.49
1984-85	31907.08	11294.68	43201.76	229.48	3740.30	412.04	4.75	4386.58	8598.96	12985.54	191996.49	16.57	11586.99
1985-86	33648.60	11087.84	44736.44	264.19	3894.41	272.46	3.58	4434.65	8747.38	13182.03	200764.50	16.96	11837.53
1986-87	34863.85	9563.48	44427.33	255.53	4109.20	442.20	6.79	4813.71	9164.81	13978.52	204174.36	17.37	11754.42
1987-88	39583.22	11742.60	51325.82	307.94	5662.90	345.96	3.85	6320.66	10102.15	16422.82	219486.63	17.78	12344.58
1988-89	41681.29	10751.89	52433.17	160.58	5468.94	234.80	4.38	5868.70	10244.56	16113.26	228783.89	18.21	12563.64
1989-90	42406.47	11932.19	54338.66	75.35	6123.19	0.00	14.65	6213.18	10642.91	16856.10	239319.20	18.65	12832.13
1990-91	49216.39	15653.93	64870.33	166.27	5832.82	448.41	3.26	6450.76	10874.70	17325.46	255061.71	19.11	13347.03
1991-92	56885.54	24411.45	81296.99	204.27	4978.23	796.94	2.78	5982.22	11606.29	17588.51	266238.48	19.58	13597.47
1992-93	62970.64	27732.84	90703.48	225.94	5104.49	1001.37	4.50	6336.30	12395.62	18731.92	275415.26	20.07	13722.73
1993-94	77438.76	28970.99	106409.74	641.19	6541.05	691.34	17.41	7890.98	15190.82	23081.80	299227.01	20.57	14546.77
1994-95	89597.06	24818.35	114415.41	467.78	8182.93	1178.34	45.44	9874.48	17787.24	27661.72	308379.23	21.09	14622.06
1995-96	97087.56	25924.66	123012.22	195.47	8145.28	1173.44	40.58	9554.77	18699.93	28254.71	324578.86	21.62	15012.90
1996-97	113768.05	27527.71	141295.76	204.11	8625.87	1227.13	47.41	10104.52	19597.23	29701.75	341125.14	22.17	15386.79
1997-98	104094.61	32179.13	136273.74	253.95	8209.74	1288.89	191.43	9944.01	20394.58	30338.59	351861.11	22.73	15480.03
1998-99	93934.48	38288.75	132223.23	405.68	8262.00	1294.30	252.64	10214.62	20643.79	30858.41	367082.11	23.29	15761.36
1999-00	111354.04	51130.95	162485.00	443.84	9195.17	1366.69	91.54	11097.24	22925.46	34022.70	389452.67	23.86	16322.41
2000-01	115687.20	55654.10	171341.30	492.60	10391.86	1456.24	211.40	12552.10	26312.90	38865.00	441519.01	24.43	18072.82
2001-02	103357.94	45182.68	148540.62	882.94	9315.07	1637.05	348.51	12183.58	25670.69	37854.27	442197.12	25.00	17687.88
2002-03	116108.40	46620.54	162728.94	798.92	9867.11	2213.45	413.17	13292.65	26471.06	39763.71	459599.70	25.56	17981.21
2003-04	122331.33	48393.81	170725.13	473.14	9575.31	3485.37	429.17	13962.99	29280.27	43243.27	481821.26	26.12	18446.45
2004-05	126672.54	49750.59	176423.14	591.44	10422.97	1854.49	437.54	13306.44	32545.00	45851.44	499501.31	26.68	18721.94
2005-06	137702.30	47729.08	185431.38	495.72	9306.34	1833.91	522.50	12158.48	33348.97	45507.45	518291.60	27.22	19040.84
2006-07	143792.17	43857.53	187649.70	523.41	10063.59	1400.66	351.77	12339.44	40191.36	52530.80	537538.40	27.76	19363.78
2007-08	155309.80	41474.11	196783.90	311.83	11986.14	2097.34	344.02	14739.33	44851.64	59590.97	570789.36	28.29	20176.36
2008-09	171470.52	40806.21	212276.73	480.05	13295.12	1935.56	439.30	16150.03	54405.67	70555.70	595571.43	28.81	20672.39
2009-10	200823.61	32630.90	233454.51	491.09	16070.39	1888.95	407.30	18857.73	64991.47	83849.20	628704.40	29.33	21435.54
Source: Ma ⁺ Trade tax ² Base year ³ Per Capita	inistry of Finan includes impor of Real GDP i. a Real GDP in	cce (various y t, export, IEI s 2000-01 Rupees	ears) Econom R, and Miscell	ic Survey a aneous (Mi	nd Internations (Construction) (Cons	onal Monet	tary Fund	(2011) Inter	national Fina	ncial Statisti	cs for Populat	tion	<u> </u>

Rs. In Million except Deflator & PCRGDP

Appendix XV

FΥ	TR	lnPOP	lnpcRGDP	tt ₁	tt ₂	TT	NTT	tt1 ²	tt2 ²	VATgdp
1974-75	5.07	2.57	9.20	10.05	16.29	1.98	3.09	100.93	265.34	1.26
1975-76	5.24	2.59	9.21	10.32	18.21	2.06	3.18	106.46	331.62	1.06
1976-77	6.37	2.62	9.22	10.74	18.36	2.24	4.13	115.40	337.10	1.46
1977-78	6.31	2.64	9.24	13.53	17.82	2.33	3.98	183.00	317.63	1.59
1978-79	5.65	2.66	9.40	18.57	16.00	2.40	3.25	344.94	256.13	1.55
1979-80	6.55	2.69	9.19	14.51	19.83	2.60	3.94	210.40	393.25	1.93
1980-81	7.46	2.71	9.25	15.47	22.11	2.99	4.47	239.39	488.74	2.29
1981-82	7.14	2.74	9.26	15.00	20.72	2.66	4.47	225.00	429.46	2.26
1982-83	7.16	2.76	9.21	11.32	22.02	2.25	4.91	128.17	484.70	2.51
1983-84	6.97	2.78	9.27	11.45	20.92	2.10	4.86	131.20	437.51	2.37
1984-85	6.76	2.81	9.36	11.72	22.50	2.29	4.48	137.42	506.31	2.23
1985-86	6.57	2.83	9.38	11.57	22.28	2.21	4.36	133.95	496.53	2.15
1986-87	6.85	2.86	9.37	11.79	21.76	2.36	4.49	138.92	473.48	2.20
1987-88	7.48	2.88	9.42	14.31	23.38	2.88	4.60	204.67	546.83	2.18
1988-89	7.04	2.90	9.44	13.12	22.92	2.57	4.48	172.16	525.24	1.98
1989-90	7.04	2.93	9.46	14.44	22.71	2.60	4.45	208.49	515.54	1.97
1990-91	6.79	2.95	9.50	11.85	25.43	2.53	4.26	140.46	646.85	2.10
1991-92	6.61	2.98	9.52	8.75	30.54	2.25	4.36	76.59	932.41	2.32
1992-93	6.80	3.00	9.53	8.11	32.93	2.30	4.50	65.71	1084.61	2.46
1993-94	7.71	3.02	9.59	8.45	35.56	2.64	5.08	71.35	1264.62	2.84
1994-95	8.97	3.05	9.59	9.13	37.10	3.20	5.77	83.41	1376.57	3.26
1995-96	8.71	3.07	9.62	8.39	37.90	2.94	5.76	70.39	1436.34	3.11
1996-97	8.71	3.10	9.64	7.58	41.42	2.96	5.75	57.49	1715.66	3.02
1997-98	8.62	3.12	9.65	7.89	38.73	2.83	5.80	62.20	1499.97	2.78
1998-99	8.41	3.15	9.67	8.80	36.02	2.78	5.62	77.36	1297.45	2.56
1999-00	8.74	3.17	9.70	8.26	41.72	2.85	5.89	68.19	1740.67	2.70
2000-01	8.80	3.20	9.80	8.98	38.81	2.84	5.96	80.69	1506.00	2.80
2001-02	8.56	3.22	9.78	9.01	33.59	2.76	5.81	81.22	1128.39	2.67
2002-03	8.65	3.24	9.80	8.50	35.41	2.89	5.76	72.22	1253.63	2.73
2003-04	8.98	3.26	9.82	7.83	35.43	2.90	6.08	61.27	1255.52	2.70
2004-05	9.18	3.28	9.84	8.23	35.32	2.66	6.52	67.71	1247.49	3.20
2005-06	8.78	3.30	9.85	6.76	35.78	2.35	6.43	45.68	1280.02	3.30
2006-07	9.77	3.32	9.87	7.00	34.91	2.30	7.48	48.98	1218.64	3.59
2007-08	10.44	3.34	9.91	7.72	34.48	2.58	7.86	59.56	1188.58	3.66
2008-09	11.85	3.36	9.94	7.75	35.64	2.71	9.14	60.12	1270.39	4.02
2009-10	13.34	3.38	9.97	8.00	37.13	3.00	10.34	64.04	1378.83	4.69

Natural Log of Dependent & Independent Variables for Regression

Notes: TR: the percentage of tax revenue to GDP; InPop: natural logarithm of population; In pcRGDP: natural logarithm of real per capita GDP (2000-01 = 100); tt1: index of openness1 (import taxes (% of import)); tt2: index of openness2 (trade (% of GDP)). TT: the percentage of trade tax revenues to GDP; NTT: the percentage of non-trade tax revenues to GDP