

UNEP Country Project on
Trade Liberalisation in the Agriculture sector and the Environment

**(DRAFT) INCEPTION REPORT ON
INTEGRATED ASSESSMENT OF TRADE LIBERALIZATION
IN THE RICE SECTOR, VIETNAM**

Project Leader: Truong Van Tuyen, PhD
Hue University of Agriculture and Forestry

February, 2003

LIST OF ACRONYMS

AFTA /CEPT	ASEAN Free Trade Area/Common Effective Preferential Tariff scheme
GOV	Government of Vietnam
Ha	Hectare
HHs	Households
HYV	High Yielding Varieties
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
IPM	Integrated Pest Management
ISG	International Support Group
MARD	Ministry of Agriculture and Rural Development
MOLISA	Ministry of Labour, Invalids and Social Affairs
MOT	Ministry of Trade
MPI	Ministry of Planning and Investment
MRD	Mekong River Delta
MV	Modern variety
NBR	Net Benefit Ratio
NGO	Non-Governmental Organization
NIAPP	National Institute of Agricultural Projection and Planning (Hanoi)
PC	People's Committee
PRA	Participatory Rural Assessment
QR	Quantitative Restriction
SLA	Sustainable Livelihood Approach
SOE	State Owned Enterprise
TV	Traditional variety
UNDP	United Nations Development Program
USBTA	The Bilateral Trade Agreement between Vietnam and the United States
USD/US\$	United States dollars
USDA	U.S. Department of Agriculture
VASEM	Viet Nam Agriculture Spatial Equilibrium Model
VLSS	Viet Nam Living Standard Survey
VLSS	Vietnam Living Standards' Survey
VND	Vietnamese Dong
WB	World Bank
WTO	World Trade Organisation

I. BACKGROUND OF THE PROJECT

1.1 AN INTRODUCTION TO RICE SECTOR IN VIETNAM

Rice continues to play a central role in Vietnamese agricultural production and food consumption. In 2000, rice cultivation area is nearly 7.7 million ha, 1.3 times higher than 1989 level, gaining the average annual growth rate of 2.4 percent. Rice productivity is 4.2 tons/ha, over 1.3 times higher than this figure in 1989. Rice output grows at rather high level, to 32.7 million tons in 2000, an increase of 1.7 times over the 1989 amount, equivalent to the average annual growth rate of over 5 percent, General Statistic Office (GSO, 2001). Rice production in Viet Nam is characterized by multiple cropping, small irrigated farms, labor-intensive practices, and widespread use of fertilizer.

Cropping Systems

The average rice cropping intensity in Viet Nam is 1.6. About 55 percent of total rice paddy area is double cropped (GSO). Double cropping of rice is widespread in the Red River Delta, the river basins along the central coast, and the Mekong River Delta. Double cropping may involve one rainy season harvest and one winter-spring harvest. In the Red River Delta, the winter-spring crop is planted in February and harvested in May-June, while in the Mekong this season occurs three months earlier. Alternatively, in the Mekong Delta and other irrigated regions in the south, a double rice rotation may involve a rainy season crop and a summer-autumn rice crop (planted in April-May and harvested in August-September). Single-cropped rice includes both upland rice and lowland rainfed rice. Upland rice is unirrigated and is planted on slopes where it is not possible to flood the fields. It is mainly grown in the Central Highlands and the Northern Uplands. Often upland rice fields are burned, planted with rice for 2 to 3 years, and then left fallow for 8 to 20 years. Lowland rainfed rice is also unirrigated, but it is planted where rainfall and topography allow the rice fields to be submerged during at least part of the growing season. A significant portion of the Mekong River Delta (600,000 hectares) is rainfed, particularly along the eastern coast and southern Ca Mau peninsula. Rice yields are 2 to 3 tons per hectare. Lowland rainfed rice area is also declining as the irrigation and drainage networks expand (Xuan et al. 1995).

Farm Size

Vietnamese farms are small. The average agricultural household has just 0.49 hectares of agricultural land, and less than 12 percent of rural households have more than 1.0 hectare (VLSS 1993-1998). The number of rural households with no agricultural land is small, as a result of the relatively equitable process of decollectivization. According to the 1994 Agricultural Census, less than 2 percent of the agricultural households had no land. The problem of landlessness is growing, however, particularly in the Mekong Delta. The Land Laws (1993, 1998) allows households to sell, lease, mortgage, and inherit land, leading some households to sell or lose their land when unable to repay loans. Statistical data indicate that the landless in the Mekong Delta has increased from less than 0.7 percent in 1994 to 5.7 percent in 1998 (Nguyen 1999). Farms tend to be smaller in the north, particularly in the densely populated Red River Delta where the average farm has just 0.22 hectares. Rice accounts for a majority of the farm area in every region except the Central Highlands (where it is 45 percent). The proportion of land allocated to rice is more than 90 percent in the two deltas.

Fertilizer and Pesticide Use

Chemical fertilizer use has increased dramatically since 1980. With the adoption of the contract system, fertilizer use climbed to 376,000 tons of nutrients (57 kilograms per hectare) in 1983 and to 544,000 tons (85 kilograms per hectare) by 1990. Since 1990, fertilizer use has increased three-fold, reaching 1.5 million tons of nutrients (200 kilograms per hectare) in 1996 (FAOSTAT and GSO 1996). This growth is attributed to the liberalization of fertilizer imports, 5 falling urea/paddy price ratios, and increasing cropping intensity of rice production (IFPRI, 2000). It is estimated that 75 to 80 percent of the fertilizer is used on paddy. Farmers are applying around 170 to 182 kilograms of plant nutrients per sown hectare of paddy (IFPRI, 2000). According to the VLSS, 92 percent of the rice farmers use chemical fertilizers. IFPRI farm survey in 1996 show that organic fertilizers are used by more than two-thirds of the rice farmers in Viet Nam, but there are wide regional differences. The proportion is more than 80 percent in the north and the South Central Coast but less than 30 percent in the Central Highlands, Southeast, and the Mekong River Delta. Insecticides are used by most rice farmers, and more than 80 percent of rice farmers in the two deltas own sprayers (Dung 1994, 34; Dac 1996, 32). Weeds are more often controlled by physical methods rather than herbicides. Integrated pest management is a topic of growing importance in research and extension activities.

The 1995 IFPRI survey on the costs of production show that cash costs of production represent 34 to 42 percent of the gross revenue from rice production, depending on the season and region. The remainder (58 to 66 percent) is the returns to family labor and familyowned land. Among the purchased inputs, fertilizer is the most important, accounting for 29 to 33 percent of cash costs, followed by seeds, machinery, and land taxes. The share of cash expenses allocated to hired labor and machinery expenses is almost twice as high in the Mekong Delta as in the Red River Delta, reflecting differences in cultivation methods discussed above. But rice farmers in the Red River Delta allocate a larger share of cash expenses to animal traction, cooperative fees, and irrigation.

Rice production growth and contributing factors

According to GSO (2001) rice paddy production increased more than 60 percent during the years 1990s (4.6 percent annually). The area devoted to rice cultivation has actually declined especially by 2000 and 2001 (MARD 2002). All of the increase in national rice production is due to higher yields and greater cropping intensity. Yields have grown by almost 33 percent (2.9 percent annually), while cropping intensity has risen by 22 percent (2.0 percent annually). This implies that higher yields are responsible for 57 percent of the production growth, while increased crop intensity accounts for 38 percent. The remainder of the production growth is explained by the small decline in cultivated area and the interaction effects (IFPRI 2000).

The potential for area expansion is very limited. Not only is agricultural lands absorbed for urban and industrial development, but an increasing share of the land is being allocated to aquaculture, vegetables and other crops as farmers diversify production to meet the demand from urban consumers (MARD 2002). In addition, cropping intensity on existing rice land could be increased, largely through investment in flood control and drainage on the southern coast, where dry-season salinity is a problem. The potential for yield increases is more difficult to estimate. Average yields have grown 2.8 percent since 1985, overing 4 tons per hectare in 2001. Historical rates of yield growth, however, may not be sustainable. This may depend on the use of chemical fertilisers. Pingali et al. (1998) argue that further increases in Vietnamese yields may be difficult

to achieve. For example, fertilizer use expanded rapidly over the 1980s in response to market liberalization, but application rates in the two main deltas are now similar to those in other irrigated regions of Asia. Furthermore, the high yields depend on labor-intensive cultivation methods that farmers may not be willing to continue as wage rates rise.

In summary, chemical fertilisers provided greatly contributions to the rice growth so far and potential growth in the future. This suggests that the concerns on environmental impact of rice cultivation and rice growth be relevant to focus on the use of chemical.

Table 1. Rice harvest area, yield, production and export of Vietnam (1990-2001)

Year	Rice harvest In '000 hectares	Paddy rice yield Mt. per hectare	Rice production In '000Mt.	Milled rice export In '000Mt.	Share in world export (% volume)	Share in world export (% value)
1990	6042.8	3.18	19225.1	1624	13	3.7
1991	6302.8	3.11	19621.9	1033	7.9	3.4
1992	6475.3	3.33	21590.4	1946	12.1	3.6
1993	6559.4	3.48	22836.5	1722	23	3
1994	6598.6	3.57	23528.2	1983	24.6	5.4
1995	6765.6	3.69	24963.7	1988	26.8	3.8
1996	7003.8	3.77	26396.6	3003	18.8	5.8
1997	7099.7	3.88	27523.9	3575	21.1	5.2
1998	7362.7	3.96	29145.5	3730	21.1	7
1999	7648.1	4.10	31393.8	4508	16.4	
2000	7666.3	4.26	32529.5	3476	18.1	
2001	7484.4	4.27	31970.2	3729		

Source: GSO (2001); FAOSTAT (2001); GTAP version 5 (2001).

1.2 RELEVANCE OF THE RICE SECTOR TO THE NATIONAL ECONOMY

Rice in Vietnam account for 96.2 percent of cereal production in term of volume. Food crop cereals share 61.7 percent in term of total value of the crop cultivation, which accounts for 78.2 percent of total agricultural revenue. The central role of rice is highlighted in the Vietnamese diet. About 75 per cent of the caloric intake is in the form of rice. According to the 1992–93 Viet Nam Living Standards Survey (VLSS), 69.9 percent of Vietnamese households grow rice and 99.9 percent consume rice. Agricultural land planted to rice is 53 percent total area or 64 percent of the sown area of crop plants.

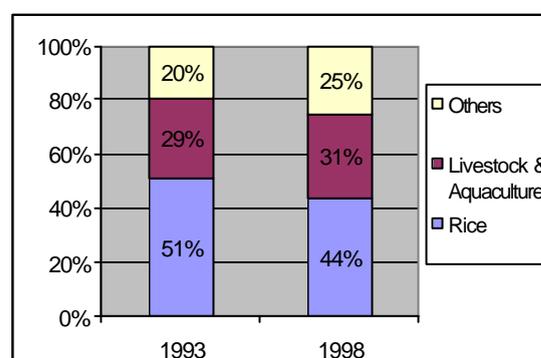


Figure 1. Rice is the Main Source of Rural Household Revenue (VLSS 1993 - 1998)

About 95 percent of rural households, which represent to 80 percent population, grow rice and almost half of them produce a surplus for sale. Rice production is the main source of income of the rural household. It share 44 - 51 percent of rural household revenue (Figure 1)

Finally, over the past 10 years, Viet Nam has become the second or third largest rice exporter in the world with 4.5 million tons exported in 1999. In the period of 1989-2000, Vietnam has exported nearly 30 million tons of rice, gaining the turnover of more than US\$ 7 million, equivalent to the average growth rate of about 13 percent/year in terms of export volume and over 12 percent/year in terms of export turnover. This contributed to 4.6 percent of total export turnover or 21.6 percent of agricultural export, which account for 30% of total export turnover (MARD 2002).

In the world rice market Vietnam become one of the largest consumers and exporters (Table 1). During the last years, Asia remains the main importer of Vietnam rice, accounting for over 50% of total rice export including Indonesia, the Philippines, Singapore, Malaysia and Hong Kong. Middle East countries such as Iran and Iraq are also big export markets of Vietnam's rice. In 2000, rice volume exported to Middle East markets made up about 30% of total export amount of the nation (MARD 2001).

1.3 PROJECT OBJECTIVES

General objective of the project to conduct a national integrated assessment of socioeconomic and environmental impacts of trade liberalization in the agriculture with specific focus on the rice sector. Specific objectives are:

- Enhance country's understanding of the environmental, as well as social and economic implications of trade liberalization with specific focus on the rice sector.
- Enhance and support national capacity in international trade policy and research.
- Assess the positive and negative environmental impacts of trade liberalization policies and multilateral trade rule, especially the accession required in rice sector, taking into account social and economic impacts.
- Elaborate country- and sector-specific methodologies to assess these impacts.
- Enhance coordination between national entities and increase national expertise in the use of integrated assessment tools in order to identify and quantify both negative and positive environmental, social and economic impacts of trade liberalization in the agriculture sector.
- Formulate policies and policy packages to correct the identified negative impacts of liberalized trade, and to maximize the positive ones, through economic and regulatory instruments as well as through the community-based initiatives.
- Perform cost-benefit analyses of implementing policy packages comprising economic and regulatory instruments and community-based initiatives.

1.3 PROJECT APPROACH AND PROCESS

Integrated assessment team:

An integrated assessment team was formed and lead by Hue University of Agriculture and Forestry (HUAF). The team members involved are Economists, Community Development, Agronomists, ecological and environmental specialists. They are from local institutions and Departments, which included Hue University (in Central Vietnam); Hanoi Agricultural University (in Northern Vietnam); Mekong Delta Farming System Research and Development Institute (in Southern Vietnam) ; and Ministry of Agriculture and Rural Development

Approach:

A stakeholder workshop was organized at the beginning of the assessment to sensitize the and to build awareness of the impact of the trade liberalization in rice sectors. The stakeholder participants were involved from the universities (Hue University; Hanoi Agricultural University) research institutes (Mekong Delta Farming System Research and Development Institute, National institute for plant protection) ministries (Ministry of Agriculture and Rural Development), Ministry of Trade; and Ministry of Natural Resource and environment), local rice producers, traders, people organisations, and NGOs (Oxfam). The workshop participants were also involved in participatory sessions for strategic screening and qualitative assessment of the environmental impact of rice intensification and rice growth (including rice trade liberalization). This focussed the assessments by concentrating on environmental impact, which was identified as a gap of the policy analyses so far. The workshop also suggested and specified the methodology for the follow up integrated assessments. Given that most of team members were not familiar with the quantitative methods and limited sources for consultation, a combination of different methodologies are relevant. However, strengthen capacity on quantitative methods should be prioritized.

Sources of data and consultation:

Available and accessible data from statistic sources and literature were reviewed and used for analyses. Primary data to be selected to supplement the assessment and further analyses , particularly to provide needed data for the quantitative models. Primary data collection is carried out with observations and visits to the fields appropriate. The consultation was mainly made through the ministry departments or offices for data collection and technical supports. Other sources of consultation regarding the trade liberalisation in rice sector were found very limited from the university or agricultural research institutes.

Policy dialogue for policy response:

This is carried out through the ISG to MARD for global integration. The assessment team collaborated with the ISG Secretariat and appropriate ad-hoc theme groups, and communicate the assessment outcome on the ISG e-forum. A collaboration was developed with the ISG Secretariat to integrate the integrated assessment outcomes into the policy consideration and dialogue through ISG missions, as follows:

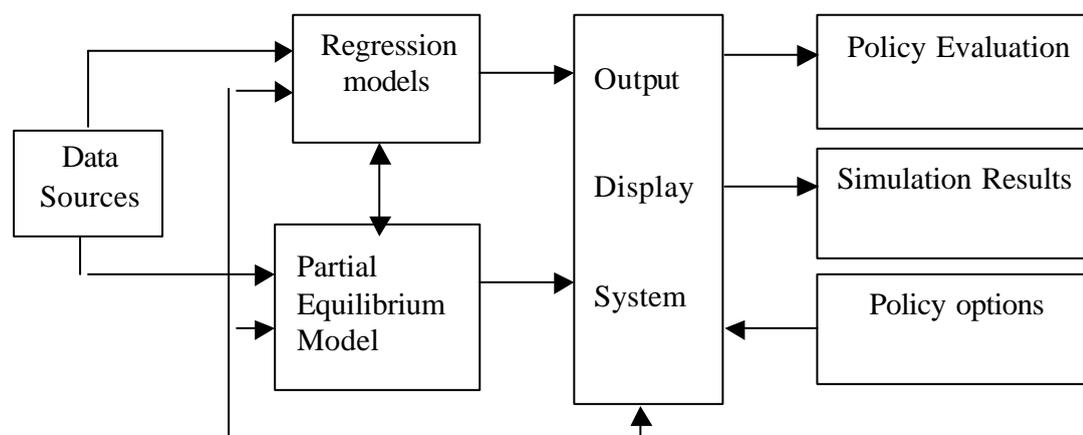
- The ISG Secretariat included the "integrated assessment of trade liberalization in rice sector" as a relevant activity to the ISG mission, particularly to thematic Ad-hoc Group for global integration and policy analyses.
- Representatives of ISG steering board and Secretariat were invited to attend the coming workshop and meetings related to carrying out the assessment activities.
- The integrated assessment team members are to be invited to the policy dialogue activities of the ISG plenary and the ISG steering board through arrangement by the ISG Secretariat. The Integrated assessment project is assisted by the ISG Secretariat to use and post the assessment results on the ISG E-forum.
- Specific working sessions between the assessment team and ISG secretariat or ISG steering board is to be scheduled based on the needs and on the ad-hoc basis.

Process for assessment implementation:

<u>Step 1</u>	<u>Step 2</u>	<u>Step 3</u>	<u>Step 4</u>
Description, strategic screening, and qualitative assessment	Develop in country Methods, and quantify impacts	Impact Valuation	Policy development and dialogue for policy response
- Sensitize stakeholders -Rice growth policies -Trade liberalization -Categorize impacts -Preliminary assessment	-Literature review -Envi indicators -Socioeconomic indicators -Quantitative model	-Economic -Social -Environmental impact value	-Recommends -Policy Dialogue -Policy response

II. METHODS FOR ANALYSIS OF TRADE LIBERALIZATION IMPACTS

In this study, the Partial Equilibrium Model (PEM) is adapted and used. PEM allow to incorporate the regression models for non-linear supply, and demand functions as well as the simulations for trade liberalization with different trade restrictions into a partial equilibrium model. A quantitative framework is described as follows.



1. The Regression Models:

Regression models are econometric techniques of estimating the extent to which variations over time and/ or across units in one variable can be explained from variations in others. Regression models are being applied in several studies to analyze the impact of trade liberalization on agriculture, rice sector in particular in Vietnam. In this study, the following regression models will be used.

1.1. Supply regression model:

Based on the assumption that the supply of rice is determined by the produced prices. The supply function is defined as:

$$\ln(Q_{it}^s) = a_i^s + E_i^s \ln(P_{it}^s) \quad (1)$$

Where: Q_{it}^s is domestic supply quantity of i-th product in year t

P_{it}^s is producer price of i-th product in year t

a_i^s is intercept of supply function

E_i^s is supply price elasticity

1.2. Demand regression model:

By the same the assumption that the rice domestic demand is depended on the consumer prices. The demand function is defined as:

$$\ln(Q_{it}^D) = A_i^D + E_i^D \ln(P_{it}^D) \quad (2)$$

Where: Q_{it}^D is domestic demand quantity of i-th product in year t

P_{it}^D is consumer price of i-th product in year t

A_i^D is intercept of demand function

E_i^D is demand price elasticity

From (1) and (2) domestic supply and demand balance will be determined as:

$$Q_{it}^s \text{CONV}_{it} (1 - \text{LOSS}_{it}) - X_{it} + M_{it} = Q_{it}^D$$

Where: CONV_i ; LOSS_i are ratio of product conversion and losses of i-th product in year t

X_{it} is export quantity of i-th product in year t

M_{it} is import quantity of i-th product in year t

Price relationships:

$$P_{it}^s / \text{CONV}_{it} + \text{MARGD}_{it} = P_{it}^D$$

$$P_{it}^s / \text{CONV}_{it} + \text{MARGX}_{it} + \text{IXT}_{it} = P_{it}^w \text{NER}_t (1 - \text{TAX}_{it}^x)$$

$$P_{it}^w \text{NER}_t (1 + \text{TAX}_{it}^M) + \text{MARGM}_{it} + \text{IMT}_{it} = P_{it}^D$$

Where: MARGD_i ; MARGX_i ; MARGM_i are producer-consumer price margin; producer-exporter price margin and importer-trader price margin.

TAX_{it}^x ; TAX_{it}^M ; IXT_{it} ; IMT_{it} are export; import taxes and implicit export-import taxes of i-th product in year t.

NER_t is the Nominal exchange rate between USD and VND in year t.

Export and import quota

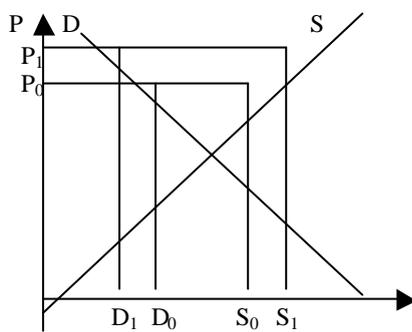
$$Q_{it}^X \geq X_{it}$$

$$Q_{it}^M \geq M_{it}$$

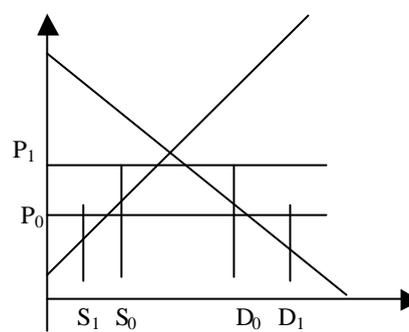
Where: Q_{it}^X , Q_{it}^M are export and import quota for i-th product in year t.

2. Partial equilibrium models

Partial equilibrium models are widely applied to analyze the impacts of trade policy on agriculture. In this study, the simplest partial equilibrium models are based on comparative static models designed to analyze the impact of the removal of restrictions to trade in Vietnam for agricultural product market (output market - rice) and agrochemical material market (input market - fertilizer and insecticide). These models allow for analyzing interaction amongst the products in both production and consumption. Based on the different scenarios, the results generated from partial equilibrium analyses are in the form of a quantification of the transfers to agricultural producers, the resulting costs to taxpayers, consumers and the impacts on environment due to overusing agrochemicals.



a. Rice market



b. Agrochemical market

* *Base scenario (P₀)*

Base scenario serves as a reference in comparison with other policy options. The base scenario will be designed for year 2005. It takes the the following assumptions:

- Rice production including rice area, agrochemical use for rice production, rice yield and rice output increases at the same rate of year 2002.
- Rice market including domestic and international rice markets are the similar to year 2002.
- Agrochemical market including fertilizer, insecticide markets are the same year 2002.

* *Scenario Options (tentatively)*

- Scenario 1 (P₁): By assumption that the implementation of the Asean Free Trade Agreement (AFTA) the tariff rate will decrease from 20% to 5%.
- Scenario 2 (P₂): By assumption that by implementing Vietnam-US trade agreement, US's tariff against rice import reduced to 8.3%, and
- Scenario 3 (P₃): By assumption that the government promoted the farm diversification process, thereby reduced the rice area by 10 percent.

3. Indicators to be analyzed

- *Impact on rice:* Price and quantity of rice supply; rice demand; and rice export

- *Impact on the agrochemical use:* Use price, use quantity, import price, and import quantity of chemical fertiliser; and those of pesticides (the chemical fertilizer and pesticide overused against the economically optimal level will then computed as representative of environmental impact)

III. POLICIES AFFECTING RICE SECTOR IN VIETNAM

There have been three groups of identified policies, which provided major affects on rice sectors in Vietnam. These included: (1) the policies promoting rice production ; (2) the policies on trade liberalization in agriculture ; and (3) the international commitments on trade deregulation

3.1 POLICIES PROMOTING RICE PRODUCTION

3.1.1. Land laws (1988, 1993, and 1998):

- Resolution No. 10/NQ-TW (5/4/1988): Recognized the state, the collective and the private sectors as legally equal components of the economy. Under this line the agricultural ownership to lands were abolished. The lands were allocated to the farmer households for long term use, 10 to 15 years. Tremendous growth in agriculture and in rice sectors started, rice production increased quickly
- Land law (1993): Passed on the laws on the land use rights and allowed the 20-year-terms in allocating crop lands to the farmer households
- Government Decree No. 10 CT-TTg (20/2/1998) stipulated and further confirmed the full rights of land use to farmers. In 1999, 5.7 million ha (78% land area) were allocated to farmers. 10,2 million households (87%) were received the official land tenure certificates. As a result, farmers were permitted to buy, own, and sell input factors such as machines, tools and draft animals. Furthermore, farmers were no longer required to sell a contracted amount of rice to the state.

3.1.2. Infrastructure investment policy:

- Increased investment into irrigation to 10.7 billion/year accounting 13 percent of total national budget for agriculture
- Investing for make use and greening bare lands (started in 1994) and expansion of reclaiming wet land for rice cultivation. Decree No. 99/TTg (96) on agricultural development in Mekong Delta put more efforts on expansion of rice lands.

3.1.3. Policies on agricultural technology and input services:

- Decree No. 13-CP (2/3/1993): Pushing up national extension work.
- Reorganizing the agricultural input (fertilizer and pesticide) service system (1998)
- Plant breeding and animal breeding program (Decree No. 225/TTg, 10/12/99)

3.2 POLICIES ON TRADE LIBERALIZATION IN RICE SECTOR:

3.2.1 Removal of internal rice restrictions

These restrictions were in place to ensure inter-regional equity in terms of security of rice supplies and to control illegal exports. The rice surplus region of the country is in the Mekong Delta whereas the rice deficit regions are in the north. These were enforced mainly in the form of fees, taxes, police checkpoints, permit requirements, but sometimes also explicit bans. These measures all act as a tax on internal rice trade because they increase costs of inter-regional trade.

Restrictions on domestic trade in rice were removed in 1997. The Government Decision No. 140 (1997) abolished the licences and control on domestic food transport and allowed to buy, process, transport, and carry out food business activities for the domestic consumption.

3.2.2. Rice export policy development:

Relaxing and removal of rice export quota

The Government controlled on the volume of rice exports since it re-entered the international rice market as an exporter in 1989. The quota set each year by the Ministry of Agriculture and Rural Development (MARD), the State Planning Committee, and the Ministry of Trade (MOT) based on estimates of domestic supply and utilization. The rights to export rice under the national quota were allocated to the two regional state-owned trading enterprises and a number of provincial state-owned trading enterprises. Reform in quota allocation (1997) authorized the provincial government to allocate the quota. The liberalization also allowed private companies to participate in rice exports in the years 1997 and 1998. Vietnam's revised Trade Law (1998) allows foreign traders to engage in direct transactions, carry out trade deals and offer trade services. They have not yet been allowed to export rice themselves, but they act as agents for the provincial food companies. The elimination of the export quota was in 2001. The Prime Minister signed Decree No. 46/2001/QĐ-TTg on Vietnam's Export-Import Management Mechanism for 2001-2005, effected of May 1, 2001. This abolished both the rice export quota and the fertilizer import quota. Furthermore, the practice of directly nominating exporters and importers of these products has been removed. Both the state owned and non-state owned enterprises holding a license to trade food or agricultural commodities can participate in rice exports. Along with the removal of the export quota, the Government of Vietnam simultaneously introduced an export subsidy, i.e. an explicit Market Price Support measure. Rice exporters will receive a subsidy of VND 180 (about USD 0.012) per export dollar (Oryza 2001).

Abolishment of fertilizer import restrictions

The use of chemical fertilizer in rice production has increased markedly since 1980. The land use rights allocation caused the use of fertilizer in agricultural production in general to increase from 57 kg/ha in 1983 to 85 kg/ha in 1990 and 200 kg/ha in 1996 (Minot and Goletti 2000). The reasons for this increase include falling urea/paddy price ratios and increased cropping intensity of rice production. According to Minot and Goletti (2000) at least 9 out of 10 rice farmers use chemical fertilizers and the level used in paddy production is in the range of 170-182 kg/ha. Organic fertilizers are also used by more than 2/3 of the rice farmers, but the use is declining due to the rising opportunity cost of labor and the declining urea/paddy price ratio

Compared to other Asean countries, Vietnamese rice production is an intense user of inorganic fertilizers. However the domestic production supplies only 13 percent of total use, thereby making imported fertilizer critical (Goletti 1998). The MARD and the Ministry of Trade determined the quantity and types of fertilizer to be imported each year, thereby controlled fertilizer imports. Quotas are allocated to the provinces based on expected provincial production. The provincial authorities then allocate the quotas to the enterprises under their management. Non-state enterprises have also been allowed to receive quota allocations subject to fulfillment of certain criteria. The fertilizer import quota has been adjusted following mid-year reviews of the local supply and demand conditions. The Government operates a Price Stabilization Fund to monitor prices on fertilizer. Together with the liberalization in rice export quota, the import

fertilizer restriction was abolished in 2001.

A summary of roadmap for Rice-related Trade Reforms (1988-2001)

1988	<ul style="list-style-type: none"> ○ Contracts regime in agricultural production introduced. ○ Dual price system terminated ○ Central government monopoly on foreign trade terminated
1991	<ul style="list-style-type: none"> ○ Private sector allowed to engage in international trade ○ Export tax on rice reduced from 10% to 1%
1995	<ul style="list-style-type: none"> ○ Export license for each shipment cancelled. ○ Export tax on rice raised from 1% to 2%.
1996	<ul style="list-style-type: none"> ○ Export tax on rice reduced from 2% to 1%.
1997	<ul style="list-style-type: none"> ○ License for paddy rice trade and transportation in domestic market cancelled. ○ Rice quotas allocated by provincial government.
1998	<ul style="list-style-type: none"> ○ Trade subsidies for the poor living in and traders operating in mountainous areas introduced (Decree 20/1998) (see section 5.2) ○ Private sector rice exports allowed ○ Foreign invested enterprises allowed to export unlicensed goods, including rice ○ [Jan.1998] Export tax on rice exempted (reduced from 1% to 0%) ○ [June 1998] Export tax on less than 25% broken rice raised from 0% to 1%. ○ [Sep.1998] Export tax on less than 25% broken rice raised from 1% to 2%; and on 25% or more broken rice raised from 0% to 1.5% ○ [Dec.1998] Export tax on less than 25% broken rice reduced from 2% to 1%; and on 25% or more broken rice reduced from 1.5% to 0%.
1999	<ul style="list-style-type: none"> ○ [Jan.1999] Export tax on rice exempted (reduced to 0%) ○ Right to export and import more liberalized (conditions for rice export of private companies relaxed, foreign invested enterprises can buy rice directly from the farmers for exports).
2000	<ul style="list-style-type: none"> ○ Rice restructuring policies released (to stabilize annual paddy rice output at 33 million tons, focus on quality and varieties of rice) ○ VAT on rice purchases for export reduced from 5% to 3% ○ Risks of market and price accepted as reasons to implement agricultural tax holiday for farmers. ○ Directions and policies for restructuring and consuming agricultural products introduced (Resolution 09/2000 of the Government) (see section 5.4).
2001	<ul style="list-style-type: none"> ○ Quotas on rice exports and fertilizer imports cancelled. ○ Rights to export rice and import fertilizer totally liberalized (i.e. regime of appointed rice exporters and fertilizer importers cancelled)¹ ○ Temporary support measures for rice producers and exporters (see 5.1).

Source: Vietnam's legal database & CIE, adapted by Oxfam (2002).

3.3 VIETNAM'S INTERNATIONAL COMMITMENTS TO TRADE DEREGULATION

Vietnam is on the way to further integration in the world economy, and under some pressure to sign up for established agreements. For the coming years the government has committed to liberalize its trade and investment rules, facilitate greater private participation in exports, abolish quantitative restrictions (QRs), lower tariffs and gradually develop the transparent, rules-based trading and investment system that would be required for entry into the WTO in the second half of the decade.

¹ Decision No.46/2001/QĐ-TTg dated 4 April 2001 on import-export management for the period 2001-2005. It was the first time the government set out import-export policy for a period of more than 1 year.

3.3.1 Vietnam's commitments under the AFTA:

Vietnam joined ASEAN on July 28, 1995, and subsequently committed to implement the Common Effective Preferential Tariff scheme (CEPT) for the realization of the ASEAN Free Trade Area (AFTA) from January 1, 1996.

- *Tariff reduction*: Tariff on a vast majority of tariff lines on imports from ASEAN members (95%, according to preliminary estimates) will be reduced to at most 20% by the start of 2003, and to 0-5 % by the start of 2006, to complete CEPT.
- *Sectoral tariff-reductions*. By early 2004 average tariffs on manufactures from ASEAN countries will fall by 50% and average tariffs on ASEAN imports of textiles, leather, wood products, non-metallic mineral products (e.g., glass and ceramic products), and food products (including vegetable oil) will fall by more than 60%.
- *Removal of non-tariff barriers (NTBs)*: All goods in the Temporary Exclusion List (TEL) will be moved to the Inclusion List (IL) by 2003, and NTBs removal on goods in the TEL when the applicable tariff is reduced to 20% or below. Currently, 4,230 tariff line items are in the IL and 1,800 items in the TEL.

3.3.2 Vietnam's commitments under the USBTA:

The bilateral trade agreement with the United States (USBTA) was signed on July 13, 2000. The USBTA is expected to become effective in late 2001. Vietnam will reduce restrictions on foreign entry into numerous service sectors like banking, tourism telecommunications, and others according to a road map agreed under the USBTA. Also, the current process of licensing for foreign investments will be replaced gradually by a more automatic process of registration for foreign investments within 7 years.

- *Overall*: Vietnam will get better access to the US export market upon ratification of the agreement by the USA and Vietnam (subject to annual renewal). In exchange, Vietnam will have to open its market through the adoption of the following measures:

In respect of goods

- *Trading rights*: Liberalize trading rights for U.S firms in three to six years.
- *Tariffs*: Reduce current tariff rates on a limited range of industrial and agricultural items (about 250) by 30 to 50 % over three years.
- *QRs*: Remove QRs on most products in three to seven years, but back-loaded for steel and cement (after six years) and petroleum products (after seven years).

In respect of services

- *Overall*: Open up the services sector considerably. Vietnam will be providing more market access than low and middle income countries under the Uruguay round and only slightly lower than the larger transition economies. The following are some examples of that opening.
- *Banking services*: Allow U.S. equity in joint ventures (with up to a 49 percent stake). After nine years, allow 100% U.S. owned subsidiary banks. Also allow U.S. equity in privatised Vietnamese banks at the same levels as Vietnamese investors. Phase in right of U.S. banks to

accept dong deposits on same basis as domestic banks over eight years for business clients and ten years for retail depositors.

- *Non-bank financial services*: Allow 100% U.S. equity in financial leasing and in other leasing after three years.
- *Insurance*: Allow joint ventures in three years and 100% U.S. equity in five to six years.
- *Other services*: Allow immediately 100% U.S. equity in a range of technical services, including in legal, accounting, engineering, computer-related, and construction areas.

3.3.3 Vietnam's agricultural policies toward WTO accession

Vietnam submitted its application to join the WTO as a developing country at the beginning of 1995. After that, a detailed Memorandum on Vietnamese Foreign Trade and Economic Policy was introduced to the WTO Working Party for examination. The preparations for initial offer regarding WTO accession negotiation was evaluated in October 2001 by the National Committee for international economic cooperation. This initial offer was then approved and sent by the Government of Vietnam to the WTO Secretariat in December 2001. This document served as foundation for Vietnam to undertake next round of negotiation on market access with respect to WTO accession. Under this line, trade reforms to be undertaken during coming years will build on the following commitments.

- *Trade-related investment measures*: Phase out all WTO-inconsistent measures (e.g., local content requirements) in five years.
- *Transparency*: Publish all laws and decisions governing issues in the agreement, establish administrative or judicial tribunals for review, and provide the right of appeal.
- *Intellectual property rights*: Apply WTO-consistent protection for intellectual rights in 12-18 months.

IV. ENVIRONMENTAL IMPACT OF RICE GROWTH AND RICE TRADE

4.1 Strategic screening of environmental impact of rice growth and trade

A 2-day stakeholder workshop on integrated assessment of the trade liberalization in rice sector was to sensitize people with an introduction of related issues. The presentations at the workshop provided reviews of following topics:

- Policy renovation related to rice sector and policy development for environmental protection since 1981
- Milestones and measures for rice trade liberalization and for global integration oriented, including accession to WTO
- Rice growth, exports, supply, demands... and issues of environmental impact assessment
- Reviews on environmental impact of rice cultivation practices, particularly from using inorganic fertilizers, pesticides, modern varieties, and irrigation.
- Reviews on social and economic impacts of rice trade liberalization
- Review on application of quantitative assessment of rice trade liberalization (methodological issues)
- Options on integration of environmental concerns into rice cultivation practices

The presentations highlighted that the available researches so far were not objective explicitly addressing the environmental impacts of rice industry growth but they contributed importantly to literature on that subject. Related data and references were mainly from agricultural universities, the agricultural research institutes, and Statistic Offices. The reviews presented helped define the focuses in next steps of the integrated assessment of the rice trade liberalization in Vietnam. Following is main syntheses from presentations and discussions:

- It was very clear that the reviewed researches mainly dealt with technology and socioeconomic impacts of the rice intensification and rice trade but neglected (relatively) the environmental impacts. There were (many) analyses and assessments of socioeconomic impacts of rice growths and rice trade. The challenge in the next assessment is to integrate environmental impact in those analyses.
- Environmental impacts of rice cultivation practices, of rice growth, and of rice trade liberalization seemed to be new to (many) participants. The comments were that next steps of the assessments should be concentrated necessarily on the screening and quantifying the environmental impact so that to take it into consideration with the socioeconomic impacts.
- Quantifying the environmental impact is feasible but it is necessary to split into steps (step by step) due to constraints on data availability and accessibility, and also due to lack of expertise researchers. Partial Equilibrium Model was suggested to measure the environmental and socioeconomic indicators. Visits to the fields be conducted to supplement the quantified analyses. However, qualitative and narrative descriptions were highly appreciated, especially for the analyses at micro level (eg. at community or grassroot level). There were indications that the socioeconomic impacts of rice trade liberalization varied highly among locations, among communities, and among social/community groups.
- An ex-ante assessment of trade measures/policy was suggested as it is relevant critically to the WTO accession position and to the current globalization process of Vietnam. For example, the policies for implementation of the "Common Effective Preferential Tariff Program (CEPT) under Agreement on Asian Free Trade Area (AFTA), which will be from 2003 to 2006.

The workshop on strategic screening and primary assessment of environmental impact of rice cultivation and rice trade liberalization composed of 6 small working groups with the following disciplines or specialization of the participants:

- those who were interested in soil and fertilizer management in rice cultivation;
- those who were interested in pesticide use and crop production;
- those who were interested in plant breeding/genetics and cropping patterns;
- those who were interested in characteristics of the traded goods in rice;
- those who were interested in transferred rice technology; and
- those who were interested in economy structure and environmental laws.

The small group working followed by plenary session helped participants come up with common understanding and group screening the environmental impacts (of both the rice intensification and the rice trade liberalization). The common impression was that the presentations followed by the small working group facilitated participants in approaching/building awareness of rice trade liberalization impact as a new knowledge area. This was helpful in the strategic screening

sessions. The outputs of the screening excersizes are presented in the Table 2 and Table 3.

Table 2. Preliminary assessment of environmental impact of rice intensification in Vietnam

Type of impact	Specification	Plant breeders & cropping pattern group	Pesticide use and crop Protection	Soil & fertiliser group
Soil	Soil degradation	---	--	---
	Productivity (Integrated farm)	+++	++	++
Water	Water contamination	--	--	--
	Eutrophication	--	--	--
	Residence area (irrigated)	+	0	++
	Water resources	--	-	-
Air	Methane emission	-	--	-
	Dusts from processing	--	---	--
Forest	Clear forest for rice lands	--	0	-
	Straw as firewood	+	+	+
	Pressure on forest	++	+++	++
Biodiversity	Expanding rice lands	--	-	-
	Aquatic biodiversity	--	--	--
	Fishery resources	---	--	--
	Natural enemies	---	--	--
	Rice genetic resource	---	--	-
Human	Physical health	---	-	--

Note: (---/+++)*negative/positive very important, (--/++) important, (-/+) not significant, (0) not clear*

Table 3. Preliminary assessment of environmental impact of rice growth and rice trade

Sources of impact	Factors effecting environment	Traded Good group	Group of rice technology	Structure & standards
Nature of goods	Increased rice production	--	0	-
	Increased rice exportation	--	-	-
	Increased chemical fertiliser use	--	--	--
	Increased pesticide use	--	---	---
Tranfered technology	Increased rice cropping	-	-	-
	Replaced rice varieties	-	-	-
	Changed fertilization	++	+	+
	New crop protection measures	+	++	+
	Increased machine operations	-	-	-
	Fields converted to aquaculture	--	-	-
	Fields converted to urban areas	--	-	-
Economic scale	Competed water sources	-	-	-
	Decreased efficiency of resources	--	0	--
	Invested to environment projects	++	++	+
Economy structure	Increased rice share in agriculture	++	+	-
	Decreased share of agriculture	--	-	-
Envi. standards	Changed environmental laws	+++	++	++
	Env. standards of technology	+	++	+
	Env. standard of agri. goods	+	++	++

4.2 Missed use of inorganic inputs for rice

A review of previous studies shows that a numerous researches was to deal with technical recommendations. The studies on economically rationale level of fertilizer use for rice in Vietnam were not found many in literature. Quantitative models applied for studying agrochemical inputs in rice were not available. There were some case studies that looked at the fertiliser and pesticide use economics. These represented the initial information and methodology. Son and Hien (1995) estimated the N, P, and K rates for yield maximization and for profit maximization by using the regression model. They found that the economic optimum rates are lower than the yield maximum rates.

Other case studies were carried out by the researchers from the Environmental Economic Program for Southeast Asia (EEPSEA). Dung and Dung (1995) employed Logit regression to relate econometrically farmer characteristics and pesticide exposure to identify types of health impairments that may be attributed to prolonged pesticide use. The pesticides' negative effects on farmers' health were estimated by means of dose-response function. Another EEPSEA research group (1997) applied production (regression) models to estimate the economically optimal level of inorganic fertiliser and pesticide for rice in the two Deltas (Red Rver in the North, and Mekong in the South of Vietnam). The missused amount against the economically optimal level was computed and valued as the environmental costs.

Table 4: Economically optimal and actual rate of agrochemical application for rice in Vietnam

Agrochemical input	Spring rice, Red River Delta			Summer rice, Red River Delta		
	Optimal	Actual	misused	Optimal	Actual	misused
Nitrogen (kg N/ha)	100.8	121.9	12.13	91	95.99	4.99
Phosphorus (kg P ₂ O ₅ /ha)	66.2	61.68	-4.48	54.4	44.57	-9.83
Potassium (kg K ₂ O/ha)	20.2	29.11	8.86	15.6	24.66	9.06
Fungicides (g.a.i/ha)	378	510	132	148	235	87
Insecticides (g.a.i/ha)	1376	1463	87	1286	622	-664
Spring rice, Mekong Delta						
Nitrogen (kg N/ha)	86	113	27			
Phosphorus (kg P ₂ O ₅ /ha)	113	57	-56			
Potassium (kg K ₂ O/ha)	18	13	-5			
Pesticides (g.a.i/ha)	743	1017	274			

Source: Dung and EEPSEA group, IDRC 1997

4.3 Degradation of rice genetic resources

Degradation of rice genetic resource is of a concern that was indicated in the stakeholder workshop on trade liberalization in rice sector. Replacement of the traditional rice varieties with the modern ones has been the major contribution to the achievement of increased rice yield and rice production. However, the growth of rice production and socioeconomic development provide more and more pressures on rice diversity, particularly causing loss of tradition cultivars. A survey carried out in 2001 by the Ministry of Agriculture and Rural Development (MARD) showed that number of traditional varieties (TV) in the whole country, though still remaining considerably high, was much lower than that of modern varieties (MV). The area planted to rice TV was also very small, accounting for 3.6 to 21.4 percent total rice growing area (Table 5). The survey also indicated that most irrigated rice lands were planted to rice MV, which required

application of high rates of inorganic fertiliser and pesticides. The rice TV however, were maintained in parts of the marginal rainfed environments such as upland, coastal sandy and flood-prond areas. Farmers applied very low fertiliser rate and almost no pesticide in rice TV cultivation. The number of rice traditional varieties maintained and the rice TV grown area implies environmental impact of rice industry in both terms the preservation of rice genetic resources and the amount of inorganic fertiliser and pesticide use.

Table 5. Number of rice cultivars and area abundance of traditional rice varieties accumulated at national regions of Vietnam in the cropping year 2000-2001. (MARD, 2002)

National region	Winter-spring crop			Summer-autumn crop		
	Number of MV	Number of TV	TV growing area in '000ha	Number of MV	Number of TV	TV growing area in '000ha
Northern	160	38	41.9 (3.6)	145	73	161.2 (11.5)
Central	116	13	8.8 (4.2)	126	41	59.1 (21.4)
Southern	167	21	136.8 (8.4)	147	27	73.3 (4.7)
Total			187.5 (6.2)			293.6 (8.9)

Note: Number in parenthesis is percentage of rice TV area from the total rice growing area

V. SOCIAL AND ECONOMIC IMPACT OF TRICE TRADE LIBERALIZATION

There has been a number of studies on social and economic impact of trade liberalization in rice sectors in Vietnam. These researches were related and focused mainly on the social and economic impact. The environmental impact was not incorporated. Among the most comprehensive studies on social and economic impact of trade liberalization in rice sectors in Vietnam were lead and carried out by the International Food Policy Research Institute (IFPRI) since 1995. Nicholas Minot and Francesco Goletti constructed a quantitative model called the Viet Nam Agricultural Spatial Equilibrium Model (VASEP) to examine the impact of eliminating the internal rice trade restriction and rice export quota on household income and poverty by combining the results of the simulations with household data on rice marketing patterns.

Table 6: Estimated effects of removal of the internal rice trade restriction and of the rice export quota on household income and poverty rate in Vietnam (IFPRI, 2000)

<i>Effects of removing internal rice trade restriction</i>	Change in household income (%)		Change in poverty rate (%)	
	Poor households	nonpoor households	Maitained restriction	Removed restriction
Whole country	-0.2	0.2	25	25
Urban areas	0.8	0.4	7.6	7.5
Rural areas	-0.3	0.1	29.4	29.4
<i>Effects of removal of the rice export quota</i>	Poor households	nonpoor households	Maitained the quota	Removed the quota
Whole country	1.7	1.4	25.0	24.7
Urban areas	-5.4	-2.6	7.6	9.1
Rural areas	2.1	2.7	29.4	28.6

The elimination of internal rice trade restriction does not have clear effect on the poverty rate. However it increases income of urban and nonpoor households. The removal of rice export quota provides higher effects on the household income and poverty rate. The real income of poor households (defined as the poorest 25 percent) rises 1.7 percent. The real income of urban households, primarily net buyers, falls 2.6 and 5.4 percent (the poor and nonpoor respectively) as a result of the higher prices associated with eliminating the export quota. The poverty rate rises in the urban areas (from 7.6 to 9.1 percent), while falling in the rural areas (from 29.4 to 28.6 percent). The overall poverty rate falls slightly from 25.0 to 24.7 percent.

VI. VALUATION OF THE ENVIRONMENTAL AND SOCIOECONOMIC IMPACT

6.1 Estimates of the Cost of Overused fertilizers and pesticides in rice

Cost of overused pesticides and fertiliser was computed by comparing the cost of farmer practice with the cost of control at economically optimal levels. The approach used to value health damage on farmers was a health cost function which was a log-linear regression model defined. The valuation method was market-based approach, information on the market price was available.

Table 7: The cost of overused agrochemical in rice (VND/ha), computed on benefit/cost against the economically optimal application level (Dung and EEPSEA group, IDRC 1997)

	Red Rever Delta	Mekong Delta
Cost of overused fertiliser	211,324	44,930
Cost of overused pesticide	117,464	105,644
Human health cost from exposure to pesticide	--	98,310

6.2 Valuation of policy change

James G. Ryan, 1999 developed a framework for the evaluation of policy research to assess the impact of IFPRI's research with Vietnam on alternative internal and external trade policies for rice in that country. The policy assessment framework measured the economic impact of the policy changes, and the contribution of IFPRI's work with Vietnam on the policies from 1995–97. The relaxation of rice export quotas and internal restrictions on rice trade made by the government of Vietnam in 1995–97 are estimated to have had a present (1995) value to Vietnam of \$61 million using a 5 percent discount rate. If continued to 2000, this will rise to \$222 million and to \$966 million by 2020. For an incremental investment of less than US\$1 million, a conservative estimate of the benefit to Vietnam of the IFPRI contribution to the policy changes effected in Vietnam from the reduction in the policy implementation lag indicates a present value in 1995 terms of US\$45 million. This represents a benefit-cost ratio of 56. A more optimistic assessment is that the present value is US\$91 million with a benefit-cost ratio of 114.

Table 8: Estimated economic benefit of rice policy change in Vietnam and IFPRI cost of research (James G. Ryan, 1999)

Year	Benefit of policy change (US\$ million)	Cost of IFPRI research (US\$ million)
1995	0	0.183
1996	16	0.552
1997	54	0.138
1998	60	0
1999	66	0
2000	80	0
2001	80	0

VII. TENTATIVE POLICY PACKAGE AND RESPONSES

7.1 Lesson learnt of the decision processes in rice policy changes in Vietnam

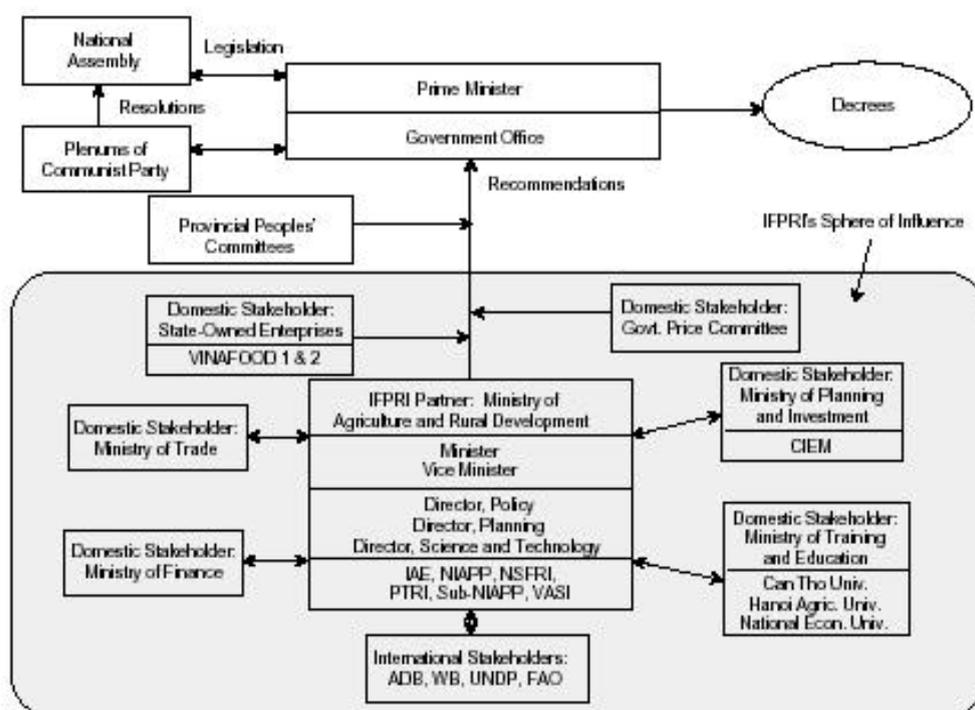


Figure 2: Decision processes in rice policy changes in Vietnam (James G. Ryan, 1999)

7.2 Tentative policy package

- Build on awareness of environmental impact of rice intensification and trade for rice stakeholder by including environmental education in public channels and extension systems
- Sensitise the environmental impact to the policy makers by initiating appropriate policy dialogue to facilitate consideration of environmental costs into taxation of use pesticides and chemical fertilisers in rice cultivation.
- Promote integrated or organic rice farming by providing research and technical supports (green box) to diversify farm production and develop non-farm rural small business.
- Abolish the floor price, but build up the ability to purchase limited quantities of rice in a short period of time and from a well targeted geographical area, in support of farm gate prices and to strengthen the emergency food aid potential of local authorities
- Losing and stopping protection of state own enterprises (SOEs) and replace the system of subsidised interest on credit (for SOEs) with new forms of credit guarantee facilities for all (potential) Vietnamese exporters.
- Policy dialogue through ISG to low down and stabilize the plan of MARD for rice production, export amount, and support improvement of rice quality and price of Vietnam rice export.

VIII. PROJECT EXPERIENCE

8.1 Preliminary Conclusions

- The stakeholder awareness and concern of environmental impact of rice cultivation and rice trade is much lower than that of socio-economic impact. The gap in awareness of environmental impact of related rice policies requires an emphasis necessarily on environment in the next policy analyses and assessments.
- Due to priority for food security and poverty alleviation, the trade liberalisation in rice sector so far has been appreciated in terms of positive socio-economic effects without inclusion of environmental impact assessment. The environmental impact assessment of rice cultivation and trade liberalisation in rice sector was much available in literature.
- Capacity in undertaking EIA in rice sector is limited because the fact that the negative environmental impact of rice cultivation and rice trade perceived by the stakeholders seemed to be low. Other difficulty is that data availability and accessibility for quantitative and macro policy analyses is not convenient and costly.
- Quantitative assessment methods are not familiar to most rice and agricultural researchers, who may be knowledgeable the qualitative relationship among rice cultivation, rice trade, and environment. In-country consultation is also limited. Environmental impact valuation is quite new in Vietnam context. It is found very limited in the literature

8.2 Steps Forward

1. Finalise the PEM and quantify the identified environmental impact of the use of chemical fertiliser and pesticide in rice cultivation under effects of the trade measures. This work will be followed up on the quantitative analysis of trade liberalisation impact on rice price, production, demand, and export.

Table 9: Indicators to be estimated and estimated impact of further trade liberalization in rice sector of Vietnam (presented results were carried out by Thematic ad-hoc group for integration, ISG to MARD, 2002)

Indicator	P ₀	P1 vs. P ₀	P2 vs. P ₀	P3 vs. P ₀
Rice supply price (VND/kg)	1443	64	13	110
Rice supply quantity (000 ton)	35169	393	78	-2917
Rice demand price (VND/kg)	2643	99	19	169
Rice demand quantity (000 ton)	15117	-255	-51	-429
Rice export price (US\$/ton)	166	7	1	11
Rice export quantity (000 ton)	4543	474	94	-1202
Fertiliser use price (VND/kg)				
Fertiliser use quantity (000 ton)				
Fertiliser import price (US\$/ton)				
Fertiliser import quantity (000 ton)				
Pesticide use price (VND/kg)				
Pesticide use quantity (000 ton)				
Pesticide import price (US\$/ton)				
Pesticide import quantity (000 ton)				

Note : **P₀**: Base scenario in 2005; **P1**: Tariff reduction to 5% under AFTA
P2: US tariff to rice import reduced (8.3%); **P3**: 10% rice growing area reduction

2. Carry out field visits and observation for data supplement and validation of the assessment.
3. Building on awareness of environmental impact for researchers and stakeholders, especially the impact of trade liberalisation via various forms of communication and training workshop.
4. Involve specialists in provision of technical supports to quantify the impact of trade liberalisation, particularly the application of Partial Equilibrium Model or General Equilibrium Model for analysis of trade liberalisation impact.
5. Initiate sensitisation and dialogue with policy makers at ministry level of the environmental concerns in rice intensification and rice trade
6. Carry out the public hearing and consultation to finalise the integrated assessment and policy development for the policy response

8.3 Issues for further discussion regarding rice trade and environment.

The outcome of the assessment may lead to interest in organic rice farming. However, Vietnam cannot be focused entirely on policies to promoting organic agriculture. This is because food security requirements, especially in the case of rice, it is difficult for the government to convert large tracts of land to organic agriculture. However, higher grades of rice can be grown with less input of fertilizers and pesticides. The other issue is to devise proactive policies that promote both the production and export. In this context, the ministry of agriculture has suggested a farm diversification, which may reduce parts of rice growing area. at the same time it may increase intense use of farm inputs due to lack of farming option. Future projects should include necessarily the options for mitigating the environmental impact of chemical inputs, such as:

- Dissemination of information on organic agriculture, made available to farmers concrete studies on the relationship between environment, product quality, and input use.
- Exist environmental standards should be aligned with international standards as far as necessary. However, it may not be necessary to invest in expensive certification infrastructures unless specific markets require.
- Accurate information on market premiums and certification requirements for organic products should be obtained and disseminated.
- WTO provisions on trade and environment should be clarified through structured training.
- EIA assessment should be included in the technology transfer to ensure environmentally sound technology and avoid importation of environmentally harmful goods.

More generally, it is felt that there is a need to increase awareness on environmental issues, especially about its interface with trade. Further learning, generated especially from the experience of other developing countries about how they have effectively coordinated these two interests, would help Viet Nam greatly. A need to know about environmental measures that may be emerging in Viet Nam's major export markets was also expressed. Building task forces of trade and environment experts as well as improving documentation on trade and environment were considered priority matters. The development of national information dissemination networks on trade and environment was considered useful. In this context, training provided through UNCTAD, as well as the work of the UNEP-UNCTAD Capacity Building Task Force would be most useful.

REFERENCES

- Beard, James (2001) *Unofficial CEPT schedule for Vietnam* received in February, with newer information on rice received in October, from James Beard, Centre for International Economics, Sydney.
- Centre for International Economics (1999) *Non-tariff barriers in Vietnam. A framework for developing a phase out strategy*. Report prepared for the World Bank, Centre for International Economics, Canberra and Sydney.
- Chantal Pohl Nielsen(2002)*Vietnam in the International Rice Market*, Fødevareøkonomisk Institut
- CIE (1998) *Vietnam's Trade Policies 1998*, Centre for International Economics, Canberra and Sydney.
- CIE (2000), *Economic integration and Vietnam's development strategy*
- CIEM (2001). *An overview of Vietnam's trade policy in the 1990s*, Research paper under 'University of Sussex (UK)/Central Institute of Economic Management' project, Hanoi
- Dollar, David, Paul Glewwe and Jennie Litvack (eds) (1998). *Household welfare and Vietnam's transition*, Washington DC: World Bank (Regional and Sectoral Studies)
- Dung, et al. (1996). *Economic And Health Consequences Of Pesticide Use In Paddy Production In The Mekong Delta, Vietnam*. The Environmental Economic Program for Southeast Asia (EEPSEA). International Development Research Centre, Ottawa, Canada
- Dung, et al. (1997) *Impact of Agro-Chemical Use on Productivity and Health in Vietnam*. The Environmental Economic Program for Southeast Asia (EEPSEA). International Development Research Centre, Ottawa, Canada
- European Commission (1998) *Commission Regulation (EC) No. 327/98* of 10 February.
- FAO (2001) *Review of Basic Food Policies*, Food and Agriculture Organization, Rome.
- FAO (2001) *Rice Market Monitor* various Volume. Commodities and Trade Division, Food and Agriculture Organization, Rome.
- FAOSTAT (2001) *FAOSTAT Agriculture Data*, www.fao.org, Accessed November 2002
- General Statistics Office (2002) *Statistical Yearbook various years*. General Statistics Office, Hanoi.
- Goletti, F., and N. Minot. (1997) From famine to surplus: Past trends and future challenges of the rice economy of Viet Nam. Paper prepared for a book manuscript for the International Food Policy Research Institute, Washington, D.C.
- Goletti, Francesco (1998) *Trade Distortions and Incentives in Agricultural Trade: The Case of Rice, Sugar, Fertilizer, and Livestock-Meat-Feed Sub-Sectors in Viet Nam*. Background paper for the World Bank Viet Nam Rural Development Strategy, FAO Loan Agreement No. TCI 44/98, International Food Policy Research Institute, Washington, D.C.
- Goletti, Francesco and Karl Rich (1998) *Policy Simulation for Agricultural Diversification*. Final Report. Strengthening Capacity for the Renewal of Rural Development in Vietnam. UNDP VIE/96/008/A/01/99. International Food Policy Research Institute, Washington, D.C.
- Goletti, Francesco and Nicholas Minot (1997) *Rice Markets, Agricultural Growth, and policy Options in Vietnam*. MSSD Discussion Paper No. 14, International Food Policy Research Institute, Washington, D.C.
- GSO (2000), *Vietnam Living Standards Survey 1997-1998*, Hanoi
- Hang, Nguyen Tho Thu (1999) *The International Market for Vietnam's Rice Exports: Opportunities and Challenges*. Class no. 4, Thesis no. 9. Vietnam-Netherlands MA program in Development Economics, <http://mdehn.virtualave.net/class4/hang/summary.htm>

- IFPRI (International Food Policy Research Institute). 1996. Rice market monitoring and policy options study. Paper prepared as End-of-Assignment Report to the Asian Development Bank for TA No. 2224–VIE, December.
- James G. Ryan. (1999) Impact Assessment Discussion Paper No. 8 Page 46
- Khiem, N. T and P.L. Pingali. (1995). "Supply response of rice and three food crops in Vietnam." In *Vietnam and IRRI: A partnership in rice research*, ed. G.L. Denning and Vo-Tong Xuan. Manila: International Rice Research Institute and the Ministry of Agriculture and Food Industry, Viet Nam.
- MARD (2000) *The Competitiveness of the Agricultural Sector of Vietnam: A Preliminary Analysis in the Context of ASEAN and AFTA*. Prepared under Technical Cooperation Project TCP/VIE/8821(a) by The Ministry of Agricultural and Rural Development of Vietnam, and the Food and Agriculture Organization.
- MARD. (2001) *General report on Analysis of vietnam agricultural policy Under the context of WTO*. Hanoi, 2001
- MARD. (2002). *Evaluation of potential impacts on Vietnam's agriculture during implementing Common effective preferential tariff program (CEPT) under Agreement on Asean Free Trade Area (AFTA)*. Hanoi, 2002
- MARD. (2002). *Impact of trade liberalization on some agricultural sub-sectors of Vietnam: Rice, coffee, tea and sugar*. Hanoi, 2002
- Minot, N., and F. Goletti. (1997). Impact of rice export policy on domestic prices and food security: Further analysis using VASEM. Paper prepared for the World Bank.
- Minot, Nicholas (1998) *Competitiveness of Food Processing in Viet Nam: A Study of the Rice, Coffee, Seafood, and Fruit and Vegetables Subsectors*. Prepared for Developing Strategies Institute, Ministry of Planning and Investment, Hanoi, and Medium-Term Industrial Strategy Project TF/VIE/95/A58, UNDP, Hanoi; International Food Policy Research Institute, Washington, D.C.
- Minot, Nicholas and Francesco Goletti (2000) *Rice Market Liberalization and Poverty in Vietnam*, Research Report, International Food Policy Research Institute, Washington, D.C.
- Neefjes, Koos (2000), *Environments and Livelihoods - Strategies for Sustainability*, Oxford: Oxfam.
- Nguyen The Dzung (1999) *Capacity Assessment for Viet Nam's National target Program For Hunger Eradication and Poverty Reduction – Part 1. Program Assessment*, Hanoi: UNDP
- NIAPP. (1995). *Processing, marketing and consuming rice in the Mekong River Delta*. Ho Chi Minh City: Sub-National Institute for Agricultural Planning and Projection.
- NIAPP. (1995). *Rice Post-Harvest Technology in the Red River Delta*. Ha Noi: National Institute for Agricultural Planning and Projection.
- Nielsen, Chantal Pohl (2002) *Vietnam in the International Rice Market: A Review and Evaluation of Domestic and Foreign Rice Policies*. Report No. 132, Danish Research Institute of Food Economics, Copenhagen.
- Oryza (2001 and 2000) *Country Market Reports Online* at <http://oryza.com/>
- Oxfam GB & Oxfam HK. (2001). *Rice for the Poor and Trade Liberalisation in Vietnam*. Final Report for discussion and feedback. Hanoi, September 2001
- Oxfam GB and Oxfam HK (2001). 'Research on international trade, local markets, and rice dependent livelihoods in Vietnam', Hanoi
- Pham Lan Huong (2001) *Impacts of trade and investment policy on income distribution in Vietnam*, Hanoi: Central Institute for Economic Management.

- Poverty Working Group (1999), *Vietnam Development Report 2000: Attacking Poverty*, Hanoi: Joint report of the Government-Donor-NGO Working Group.
- Que, Nguyen Trung (1998) *Effects of Liberalization on Agriculture in Vietnam: Institutional and Structural Aspects*. Working Paper no. 40, The CGPRT Centre, Bogor, Indonesia.
- Que, Nguyen Trung and Nguyen Ngoc Que (2000) *Effects of Trade Liberalization on Agriculture in Viet Nam: Commodity Aspects*. Working Paper no. 52, The CGPRT Centre, Bogor, Indonesia.
- Socialist Republic of Vietnam (2001) *Poverty Alleviation Strategy 2001-2010*, Ministry of Labour, Invalids and Social Affairs
- Socialist Republic of Vietnam (2001) *Strategy for Socio-economic Development 2001-2010*, endorsed by the 9th Congress of the Communist Party of Vietnam
- United States Department of Agriculture. (2001). *Rice Outlook*. Washington, D.C.: U.S.Department of Agriculture, Economic Research Service. Various issues.
- Viet Nam, *Statistical yearbook various years*. Ha Noi: General Statistical Office, Statistical Publishing House.
- Viet Nam. (1994) *Vietnam living standards survey 1992-1993*. Ha Noi: General Statistical Office.
- Viet Nam. (1995). *Agriculture of Vietnam, 1945-1995*. Ha Noi: Statistical Publishing House.
- Viet Nam. (1996). *Viet Nam - Statistical data of agriculture, forestry and fishery, 1985 -1995*. Ha Noi: General Statistical Office, Statistical Publishing House.
- Viet Nam. (1996). *Vietnam's economy the period 1945-1995 and its Perspective by theYear 1995*. Ha Noi: Statistical Publishing House.
- Viet Nam. (2000) *Vietnam living standards survey 1993-1998*. Ha Noi: General Statistical Office.
- Vietnam Economic Times (2001) *Economy 2000-2001 - Vietnam & the World*
- Vu Tuan Anh, (1994) "Development in Vietnam - Policy reforms and economic growth."
- World Bank, Asian Development Bank, UNDP (2000) *Vietnam Development Report 2001; Vietnam 2010: entering the 21st century; Overview & Part 1 – Pillars of Development*, Hanoi