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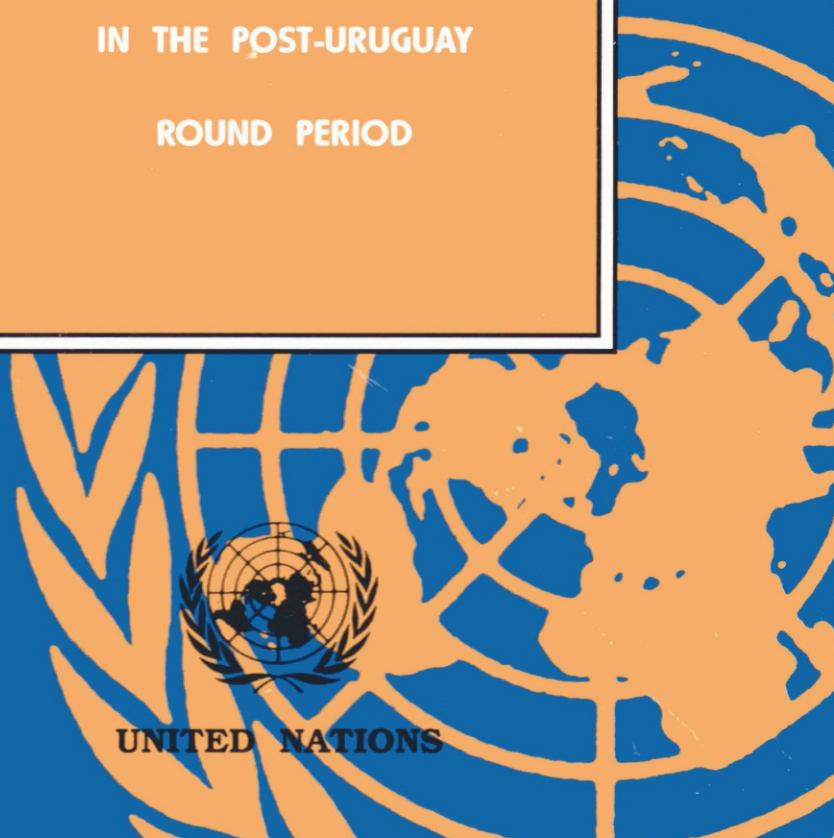
BENEFITS AND CHALLENGES FACING ASIA-PACIFIC AGRICULTURAL TRADING COUNTRIES IN THE POST-URUGUAY ROUND PERIOD



UNITED NATIONS

ECONOMIC AND SOCIAL COMMISSION
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Benefits and Challenges Facing Asia-Pacific Agricultural Trading Countries in the Post-Uruguay Round Period

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Preface

The successful conclusion of the Agreement on Agriculture of the Uruguay Round of multilateral trade negotiations represents a milestone in the development of the agricultural sector in that agriculture has been brought within the disciplines of GATT for the first time.

Even though the impact of the Agreement is not likely to be dramatic over the short term, the significance of the commitments to liberalization lie in the opportunities they provide for the increased integration of developing countries into the international trading system. Moreover, the Agreement lays down new disciplines under which governments may intervene in the agricultural sector. It is expected that reductions in domestic support over the medium and long term will lead to a more competitive global agricultural sector.

Among developing countries, those of the ESCAP region have been at the forefront of trade liberalization. Agricultural trade policy in the post-Uruguay Round period should be viewed therefore as an ongoing process in which it is in the best interest of all developing countries of the region, to participate in this process.

As a whole the ESCAP region is expected to be a large beneficiary of the Uruguay Round agreements. As far as agriculture is concerned the region will probably experience limited increases in net exports of rice, meat and milk products while the net agricultural imports of the region are expected to increase, largely as a result of a substantial expansion of imports by Japan.

However, the low-income net food importing countries of the ESCAP region, particularly the least developed countries, the Pacific island countries and the economies in transition who are still struggling in the arduous development process are expected to experience additional adjustment difficulties, at least over the short term, due to increases in prices in grains and processed food as well as possible declines in food aid. In recognition of these problems special provisions were made for LDCs in the Final Act and modalities for translating them into concrete action will need to receive priority attention.

In recognition of the important impact on agricultural trading countries the Uruguay Round agreements will have in the transitional phase, the ESCAP Secretariat undertook a number of studies which are contained in this publication. It is hoped that the information contained herein will contribute to a sharpened perception of the likely implications of the agriculture-related agreements of the Uruguay Round, and that it will lead to a strengthening of trade policy decision-making in the post-Uruguay Round transition phase.

The generous financial support of the United Nations Development Programme which made this publication possible and the collective expertise of the authors of the studies are gratefully acknowledged.

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PART ONE

IMPLICATIONS FOR AGRICULTURAL EXPORTING COUNTIRES OF THE ESCAP REGION

I. ANALYSIS OF THE BENEFITS AND CHALLENGES FACING ASIAN AND PACIFIC AGRICULTURAL EXPORTING COUNTRIES IN THE POST-URUGUAY ROUND PERIOD

by

Ron Duncan, David Robertson and Yongzheng Yang
National Centre for Development Studies
The Australian National University
Canberra

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A. INTRODUCTION

The focus of this study is on the implications of the General Agreement on Tariffs and Trade (GATT) Uruguay Round Agreements on Agriculture for the major agricultural commodity countries of the ESCAP region. In particular, this study was instructed to address the following questions. What policies should these countries follow to maximize the benefits flowing from the agreements on reductions in barriers against agricultural commodity imports and in subsidies on agricultural exports, as well as the agreed reductions in domestic supports for agricultural production? Are there benefits to be gained from cooperative action on a regional basis? What are the likely changes in their terms of trade, in investment flows, and productivity gains, and in the potential for increases in exports? What are the implications for improvements in economic welfare in the countries of the ESCAP region? Given that significant trade barriers against agricultural commodities will remain, even after the full phase-in of the agreements, what could this mean in terms of incentives for individual or collective action by these countries?

The remainder of this section presents data showing the agricultural trade patterns of the major agricultural exporting countries in the ESCAP region. There is detail provided on the bilateral flows in the trade of the agricultural commodities of interest to this study – rice, wheat, cotton, vegetable oils, and fruit and vegetables.

In the next section there is a presentation and discussion of the Uruguay Round Agreements on Agriculture, focusing on the implications for developing countries. There is a detailed account of the agreed changes in trade barriers as they affect agricultural commodities and on the agreed changes in domestic farm supports and export subsidies. The section also outlines the agreed changes in the provisions for special and differential treatment for developing countries and states how the agreements on reductions in trade barriers will affect these provisions.

Section C reviews the results of the several model simulations which have been previously carried out on the impact of the Uruguay Round. These were mostly carried out before the Round was concluded so they are based on hypothetical conclusions to the Round. These results are used as benchmarks for the results of the simulations of the Centre's trade model on the actual agreements reached in the Round which are reported in Section D. The trade model was programmed with the changes

in the trade barriers and other changes affecting agricultural commodity production and trade agreed in the Round. Effects on export volumes and prices, economic welfare, distribution of the benefits within and between countries, and intraregional and interregional effects are covered.

Section E presents discussion on the model simulation results, drawing conclusions about the implications of the Uruguay Round agricultural agreements for the developing countries of the ESCAP region.

Section F concludes with recommendations on appropriate strategies in respect of trade, investment and research policies, including areas in which regional cooperation should be beneficial.

1. Trade profiles of countries in the ESCAP region

The merchandise trade of 15 major countries of the ESCAP region in 1992, disaggregated in terms of non-fuel primaries, fuels, and manufactures, is shown in table 1 for 1992. This set of countries includes major developed country agricultural exporters, Australia and New Zealand, and major developing country agricultural exporters, China, Indonesia, India, Malaysia, and Thailand. Of this set of countries, Japan and the Republic of Korea are by far the most significant importers of agricultural commodities. China and Thailand are the next most important.

The relative importance of non-fuel primary commodities and fuels in the merchandise trade of the developing countries in this group of selected countries is shown in table 2. Here the top three primary commodities in the country's export basket are shown, together with the share of the three in total merchandise exports. There is a low degree of concentration in China, the Republic of Korea, India, Philippines and Thailand. However, countries such as Papua New Guinea and Viet Nam have a high exposure to volatility in a few export commodities. Countries such as Malaysia, Indonesia and Thailand have rapidly reduced their primary commodity exposure in recent years as their manufactures exports have flourished.

The agricultural commodities specified as being of particular interest for this report are rice, wheat, cotton, vegetable oils, and fruit and vegetables. The shares of the major countries of the ESCAP region in world exports of these commodities over the 1990-1992 period are shown in table 3. Several countries are major exporters of these commodities, such as Australia in wheat, Thailand, Pakistan, and India in rice, China and Thailand in fruits and vegetables, Australia, Pakistan, China and India in cotton, and Malaysia, Indonesia, and Philippines in vegetable oils. In aggregate, countries of the ESCAP region are most important as exporters

Table 1. Exports and imports of selected countries of the ESCAP region, 1992

(Millions of US dollars)

Selected countries	Exports					Imports				
	Primary, nonfuel (0+1+2+4+68)	Fuel (3)	Manufactures (5+6+7+8-68)	Other nec (9)	Total (0 to 9)	Primary, nonfuel (0+1+2+4+68)	Fuels (3)	Manufactures (5+6+7+8-68)	Others nec (9)	Total (0 to 9)
Australia	16,885	7,651	7,248	6,261	38,045	3,349	2,384	32,920	3,487	42,140
Bangladesh	347	8	1,545	3	1,903	1,008	313	923	6	2,252
China	13,947	4,668	108,156	920	127,690	8,917	2,452	62,916	1,057	75,341
Indonesia	6,469	11,274	16,070	3	33,815	4,302	2,126	20,730	121	27,279
India	4,558	582	15,203	337	20,679	3,435	7,215	12,065	1,490	24,206
Japan	6,674	1,714	325,864	5,239	339,492	70,216	52,721	104,762	3,277	230,975
Korea, Rep. of	3,743	1,685	70,920	46	76,394	14,947	14,651	51,454	359	81,413
Malaysia	9,623	5,192	26,876	596	42,287	2,689	1,543	24,638	653	29,523
New Zealand	6,617	242	2,372	107	9,338	1,029	608	7,551	12	9,200
Pakistan	1,435	88	5,722	19	7,264	2,076	1,534	5,738	12	9,360
Philippines	2,409	238	4,042	3,101	9,790	2,183	2,147	8,617	2,517	15,465
Papua New Guinea	945	2	124	5	1,076	184	121	829	152	1,286
Sri Lanka	683	0	1,753	51	2,487	675	309	2,483	3	3,470
Thailand	9,032	184	19,198	318	28,731	5,410	3,337	30,744	975	40,466
Viet Nam	113	63	1,459	15	1,650	763	729	544	20	2,055

Source: United Nations trade data, International Economic Data Bank, Australian National University.

Table 2. Export Concentration Ratios, 1990 (Share of top three commodity exports in merchandise exports)

Countries	Top three primary commodities	Share in merchandise exports (percentage)
Bangladesh	shellfish; jute and other fibres; tea	21.7
China	crude petroleum; shellfish; refined petroleum	8.4
India	tea; iron ore conc; refined petroleum	9.4
Indonesia	crude petroleum; natural gas; rubber	39.8
Korea, Republic of	fresh fish; refined petroleum; shellfish	2.5
Malaysia	cruide petroleum; timber; rubber	30.6
Pakistan	cotton; rice; shellfish	23.1
Papua New Guinea	base metal ores; coffee; timber	76.5
Philippines	fruit & nuts; vegetable oils; base metal ores	15.4
Sri Lanka	tea; rubber; fruit & nuts	26.1
Thailand	rice; shellfish; preserved fish	13.6
Viet Nam	shellfish; crude petroleum; coffee	50.8

Source: United Nations trade data.

in the rice market (over 46 per cent share), the vegetable oils and fats market (about 30 per cent share), and the cotton market (about 25 per cent share).

The bilateral flows of these exports are shown in table 4. The importing countries which are in the ESCAP region are highlighted in the table. As can be seen, the bulk of the trade flows are intraregional. For example, the top five importers of cotton exports from Australia and Pakistan are countries from the ESCAP region. The top four importers of Malaysian vegetable oils are countries from the ESCAP region, as are the top three importers of China's fruits and vegetables exports. Some of the flows such as vegetable oils and fats exports to the Netherlands are determined by processing needs. The Netherlands is a traditional port of entry and centre of processing of raw materials coming into the Western European market. Other trade flows such as Indian exports of rice to countries outside the ESCAP region are largely determined by geographical and political factors.

The importance of intraregional flows of agricultural commodities will be discussed in later chapters.

Table 3. Shares of selected countries of the ESCAP region in world exports of agricultural commodities, 1990-1992
(average, percentage)

	Unmilled wheat (041)	Rice (042)	Cereals & preparations (048)	Fruits & vegetables (05)	Cotton (263)	Vegetables & fats (42)
World (millions of US dollars)	15,171	3,689	10,724	53,076	7,209	10,208
Australia	8.9	0.09	1.7	1.0	8.5	0.02
Bangladesh				0.02	0.01	
China	0.01	1.9	1.03	4.4	3.6	1.02
Indonesia		0.08	0.21	0.53	0.1	4.8
India	0.2	8.5	0.13	0.9	3.1	0.46
Japan			1.8	0.25	0.23	0.18
Korea, Republic of		0.03	0.9	0.53	0.22	0.02
Malaysia			0.65	0.36	0.04	17.2
New Zealand			0.21	1.2		0.01
Pakistan		9.5	0.01	0.11	7.4	
Papua New Guinea						0.63
Philippines		0.1	0.09	0.9		3.7
Sri Lanka		0.01		0.13		0.04
Thailand		25.9	0.64	3.2	0.09	0.05
Viet Nam						

Source: United Nations trade data, International Economic Data Bank, Australian National University.

Table 4. Bilateral data on export flows for major agricultural exporters in the ESCAP region (top five importers)

Exporters	Wheat (041)		Rice (042)		Cotton (263)		Fruits & vegetables (05)		Vegetable oils & fats (42)	
Australia	Egypt	$227.9			Japan	$204.7				
	Japan	$163.0			Indonesia	$135.3				
	Iran, Islamic Rep. of	$128.1			Korea, Rep. of	$93.2				
	Indonesia	$118.1			Taiwan Province of China	$43.8				
	China	$108.3			Thailand	$27.1				
China							Japan	$657.3		
							Hong Kong	$485.6		
							Singapore	$138.4		
							Germany	$132.8		
							United States	$100.0		
India			Saudi Arabia	$124.7	USSR	$55.7				
			USSR	$34.2	Hong Kong	$29.0				
			United Kingdom	$29.3	Japan	$28.1				
			United Arab Emirates	$24.4	Thailand	$17.8				
			United States	$15.4	Taiwan Province of China	$12.0				
Indonesia									Netherlands	$183.6
									United Kingdom	$41.4
									Italy	$33.4
									China	$30.4
									Singapore	$28.9
Malaysia									Pakistan	$276.9
									Singapore	$220.0
									China	$153.5
									Japan	$117.5
									Netherlands	$105.6

Table 4. (*continued*)

Exporters	Wheat (041)	Rice (042)		Cotton (263)		Fruits & vegetables (05)	Vegetable oils & fats (42)	
Pakistan		Iran, Islamic Rep. of	$57.1	Hong Kong	$86.6			
		Saudi Arabia	$52.4	Thailand	$60.7			
		United Arab Emirates	$41.4	Indonesia	$51.9			
		Oman	$13.4	Japan	$51.6			
		Jordan	$12.3	Bangladesh	$46.7			
Philippines							United States	$171.3
							Netherlands	$128.9
							Japan	$20.8
							USSR	$9.0
							Korea, Rep. of	$7.4
Thailand		Hong Kong	$106.9					
		Singapore	$79.2					
		United States	$67.5					
		Malaysia	$60.4					
		Indonesia	$44.2					

Source: United Nations trade data, International Economic Data Bank, Australian National University.

Note: The 1990-1992 average figures for exports shown here have been checked against partner-country data on imports and adjusted where it was obvious that the export data were inadequate. In some cases, partner data on imports are the only source available. The commodities are shown in terms of the two or three digit (The Standard International Trade Classification (SITC)).

B. THE URUGUAY ROUND AGREEMENT ON AGRICULTURE

The Uruguay Round of trade negotiations had the most comprehensive and complex agenda ever undertaken in GATT. Apart from the traditional negotiations on access to markets for industrial goods, initiatives were taken to restore GATT disciplines in major sectors which had been neglected or made subject to special regimes. These included a new agreement on safeguards (article XIX) that bans all new 'grey area' measures (VERs) and requires the elimination of existing measures within four years. Sectors of specific interest to developing countries were raw material processing, tropical products, textiles and clothing (multifibre arrangement), and agriculture. In addition, steps were taken to extend the Treaty's coverage to include trade in services, intellectual property transactions and important links between trade and investment.

Because of the range of this agenda and the divergence of interests among the participating countries, it was necessary for negotiations to move forward on a broad front to ensure that concessions were balanced. The crux of the negotiations, however, was clearly agriculture. The commencement of the Round in 1986 had been delayed four years by European Community (EC) unwillingness to negotiate on agricultural issues. Even after the Punte del Este Declaration, the EC was reluctant to open genuine negotiations. The Mid-term Review in Montreal (December 1988) became stalled when Latin American members of the Cairns Group refused to adopt agreed texts without a clear commitment to a framework for agricultural negotiations. This drama was repeated two years later in Brussels, where the GATT Ministerial Meeting in December 1990 was intended to approve the Final Act. Effectively, the Agreement on Agriculture determined the final outcome of the Round in Geneva, three years later. Without a substantive agreement on agriculture there would have been no Uruguay Round agreements.

Although the main confrontation in the agricultural negotiations was between the United States of America and the EC (supported by the European Free Trade Association (EFTA) neighbours with equally protectionist agricultural policies), the Cairns Group was an important ginger group for the liberalization of agricultural markets. Developing countries in the Cairns Group, including several Asian countries, twice provided the gesture that blocked EC efforts to conclude the Round without an agricultural agreement. Without the stand by Latin American negotiators, it is doubtful whether the Cairns Group of agricultural exporters could have held the EC and the United States to their undertakings on agriculture

in the Punte del Este Declaration. At the Brussels meeting, for example, several major countries wanted to sign the draft final act, when agreement on agriculture appeared unlikely, rather than to place in jeopardy the significant agreements that had been reached on other issues.

Over the seven years of Uruguay Round negotiations, the interests of developing countries in the outcome intensified, especially in Asia. Unilateral liberalization of trade policies accompanied commitments to market-based development strategies, and this openness increased the importance of foreign trade and investment to these economies. Thirty developing countries acceded to GATT during the Uruguay Round, and many other applications remain to be processed. Growth in exports of manufactures has been particularly important for developing countries in the ESCAP region, which encouraged participation in Uruguay Round negotiations on market access. They also had vital interests in negotiations on services, trade-related aspects of intellectual properly rights (TRIPs), trade-related investment measures (TRIMs) and strengthening GATT disciplines.

Most developing countries in the ESCAP region also have a vital interest in agricultural trade, as exporters or importers. Although agricultural trade now accounts for only 13 per cent of world merchandise trade, it has deep consequences for economic development. In the past, countries such as Indonesia, Malaysia and Thailand have been dependent on earnings from exports of agricultural and tropical produce. The subsequent development of their agricultural sectors has provided the domestic savings and the labour for their industrial development. Many other countries have large populations that put pressure on domestic agricultural production and make them dependent on imports, at least for residual supplies. Subsidized exports of surpluses generated by assistance policies in the EC and the United States have exerted downward pressure on world agricultural prices and encouraged imports. At the same time, many developing countries have neglected their agricultural sector – seven taxing them heavil – yand disadvantaged farmers through protection of the manufacturing sector, financial restrictions, and over-valued exchange rates. Whether net importers, exporters, or self-sufficient in food, most countries in the ESCAP region have an interest in the outcome of the Uruguay Round Agreement on Agriculture.

1. Outline of the Agreement

The Agriculture Agreement has three main components, covering import access, export competition and domestic support outlays. These

contain the definition of new rules and schedules for reducing levels of protection and support, and associated safeguards, quarantines and qualifications. The separate Agreement on sanitary and phytosanitary measures is also relevant for agricultural trade.

The Agreement on Agriculture provides a complete set of operational rules for the agricultural sector. Tariffs are established as the legally accepted form of protection for agriculture and these tariffs are bound against increases. Domestic supports for agriculture are constrained by new commitments to restrain outlays in the agreement and its associated schedules. By binding export subsidies and total domestic supports for agriculture, as well as all border measures, this agreement goes beyond normal GATT tariff bindings. All previous waivers and special exemptions for agriculture are to be removed. Moreover, all participating countries have undertaken specific commitments – including developing countries, although they are granted longer transitional timetables and smaller reductions in accordance with GATT's enabling clause which provides for their differential and favourable treatment. Only least developed countries have not given undertakings to reduce protection; they also receive special treatment under a separate Decision in the Final Act.

(a) Market access

All non-tariff border measures are to be converted into tariff equivalents, based on 1986-1988 levels. These comprise quantitative import restrictions, variable import levies, minimum import prices, discretionary import licensing, interventions by state trading enterprises and voluntary export restraints. All tariffs are to be bound (i.e., can only be increased after negotiation with trading partners) and they take effect as soon as the Final Act takes effect (expected to be January 1995). No new non-tariff measures are to be introduced. There are a few exceptions to this tariffication, however. Some countries are allowed to delay tariffication for a few years (for example, Japan and the Republic of Korea for rice), but stringent conditions apply. Developing countries are exempted from the tariffication commitment on products that are staples in traditional diets (Annex 5: Special Treatment Clause in Agreement on Agriculture).

Following tariffication of border measures, all tariffs are to be phased down as follows:

(i) Developed countries will reduce tariffs by an average 36 per cent over 6 years, with a minimum 15 per cent reduction in any tariff line.;

(ii) Developing countries will reduce tariffs by an average 24 per cent over 10 years, with a minimum 10 per cent reduction in any tariff line;

(iii) Least developed countries do not have to reduce tariffs but they are required to bind them. (These less stringent requirements for developing countries represent part of the differential and more favourable treatment granted under the GATT.)

These reduced tariffs will be bound, which represents a major reduction in uncertainty in agricultural markets.

In addition to tariffication, countries are required to provide 'minimum access' to markets. Where present imports of a defined product are less than 3 per cent of domestic consumption, access is to be raised immediately to 3 per cent, and expanded to 5 per cent after 6 years. These are minimum access quotas which require tariffs to be set to allow significant access. Where current imports account for 5 per cent of domestic consumption, this is to be maintained. In addition, to guard against loss of market access after tariffication (for example, loss of VER access or quotas), minimum access conditions are defined.

Special treatment was agreed for Japan and the Republic of Korea for rice. Japan's minimum access for rice will be based on 4 per cent of domestic consumption, increasing by equal annual amounts to 8 per cent after 6 years. Minimum access in the Republic of Korea's will be only 1 per cent at the beginning of implementation, rising to 4 per cent by the beginning of the tenth year. Larger access shares were provided in other products by these two countries to compensate for this concession.

Special safeguards are provided in the Agreement (Article 5) against disruption of import markets from import surges or low prices, based on defined 'trigger levels'. Where these safeguards are invoked, additional tariffs may be applied. Safeguards are to be limited in duration and must be progressively relaxed throughout their duration.

(b) Export competition

Competitive subsidization of agricultural exports severely disrupted world markets in the mid-1980s. As well as capturing market share from third country exporters, the EC system of restitution payments and the United States export enhancement programme placed pressure on their agricultural budgets. Subsidies became a major issue in the Uruguay Round negotiations.

Participants agreed that no new export subsidies should be introduced and that existing export subsidies would be subject to reductions:

(i) Budget expenditures on export subsidies by developed countries are to be reduced by 36 per cent over 6 years from 1986-1990 levels in 22 defined product categories. In addition, the volume of exports subsidized are to be reduced by 21 per cent over 6 years from 1986-1990 levels in the same product categories;

(ii) Developing countries agreed to reduce expenditures on subsidies by 24 per cent over 10 years, coupled with a 14 per cent volume reduction.

Genuine food aid is exempted from these reductions, which covers least developed countries' interests (Article 10).

The schedule commitments (Article 9) define export subsidies as payments-in-kind, exports from stocks with financial assistance, producer-financed export subsidies, export marketing cost subsidies, transportation subsidies and subsidies incorporated into exports. Export credits and credit guarantees are to be covered in a separate agreement.

This definition is used to set agreed base levels of subsidized exports and subsidy outlays in countries' schedules defined over the period 1986-1988. Using these past levels of export subsidies, participants have accepted legally binding commitments on future export subsidies. This identifies export subsidies for agriculture for the first time in GATT. The burden of proof against claims of subsidizing exports rests with the exporting country. The agreement contains rules on circumvention and a commitment not to extend export subsidies to new commodities.

The agreement on subsidy constraints means that subsidized exports by the United States and the EC, which have been increasing in recent years, will now decline. The alternative position for grains, dairy and meat exports would have been further price distortions. Now competitive exporters should obtain larger shares in third country markets.

(c) Domestic support

The nature of agricultural policies is that domestic support schemes probably have as much effect on international trade as border measures. The Uruguay Round agreements, therefore, set rules and commitments on domestic support policies.

Certain domestic supports are excluded from the agreed budgetary reductions. These policies, placed in the so-called 'green box', are deemed to be minimally trade-distorting: research and extension, inspection, marketing and promotion, infrastructure, food security stocks, domestic food aid, crop insurance, income safety-net schemes, disaster payments, retirement programmes, set-asides, structural adjustment programmes, environmental programmes and 'decoupled' income support. For developing countries, additional exceptions are granted for rural development programmes, investment subsidies, input subsidies and diversification subsidies. This formidable list of exceptions raises serious doubts about the commitment to reduce domestic supports (Annex 2).

Expenditures on other domestic support schemes are to be reduced by 20 per cent over 6 years from the 1986-1988 base (13.3 per cent for developing countries). The value of this commitment, however, is undermined by the last minute exclusion of direct payments under production-limiting programmes (set-aside land, herd reductions, etc.). The total support covered by the reduction is determined by the aggregate measurement of support (AMS). AMS is the annual level of support expressed in money terms for all policies and instruments (Article 6 and Annex 3). Policies with minimal trade-distorting effects or effects on production are exempt from AMS reduction commitments. Under the Blair House Accord (November 1993) the EC and United States negotiators agreed to additional exclusions for United States deficiency payments and new EC compensation payments under the Reformed Common Agricultural Policy (CAP). These are major aspects of domestic support outlays. Moreover, the Dunkel Draft discipline that domestic support commitments should be product-specific was removed, giving scope to transfer support programmes among products, as long as the aggregate 20 per cent target reduction is achieved.

(d) 'Peace clause'

As an incentive to accept the new disciplines and commitments in the Agreement on Agriculture, policies covered are sheltered from challenges or countervail under GATT during the transition periods (six years for developed countries, ten years for developing countries). If a participant fails to meet obligations under the agreement, countervailing duties may be levied upon proof of injury. In addition, it was agreed that a new round of agricultural negotiations would begin in 1999, the fifth year of implementation.

(e) Implementing the Agreement

A GATT Committee on Agriculture is to be established to monitor

progress in implementing the agreement and an enhanced dispute settlement procedure will take effect. Vagueness in some of the articles of the agreement will give scope for disputes. The interpretations that countries place on their commitments in the Agreement will only become apparent over time. Certain safeguards are not subject to supervision by the Committee. In spite of the apparent clarity of the reductions under the three main components of the Agreement – 36-20-36 (24-14-24) – much will depend on the base-periods, the extent of 'dirty' tariffication, and the flexibility of interpretation of items in 'the green box'. Like GATT itself, the feedback and acceptance of the Agreement on Agriculture will depend on countries' commitment to its objectives.

2. Application of sanitary and phytosanitary measures (SPS)

The SPS Agreement is intended to improve quarantine and similar regulations to protect health and safety, and to prevent their use as disguised protection. Countries have the right to set their own health and safety standards, provided they are based on 'scientific justification' and they comply with international standards where such standards exist. The SPS Agreement is closely linked with the Agricultural Agreement, both because of the potential for health and safety standards being used as disguised non-tariff border measures and because introducing new SPS standards could offer opportunities to avoid new rules on agricultural trade. It is, therefore, an important supplement to the new disciplines in the Agreement on Agriculture.

The SPS Agreement does not regulate specific policies, so no specific national commitments are included. It provides general guidelines for government behaviour. Its implementation depends on interpretations of the principles of harmonization and equivalence set out in the agreement. Where harmonization is not appropriate through the adoption of agreed international standards, countries may opt for 'equivalence' where importers accept the SPS applied in the exporting country. Equivalence offers a simple step towards harmonization as increasing trade leads to convergence among national standards. Where countries insist on their own domestic standards, they must not discriminate by source. It remains to be seen whether the SPS Agreement will reduce trade disputes, such as the EC ban on hormone additives in beef.

The SPS Agreement could have particular importance for exporters of horticultural produce and animal products, by making it more difficult for importers to establish discriminatory standards.

3. Trade in tropical products

Tropical products occupied a special place in the Uruguay Round negotiations because at Punte del Este developing countries convinced other contracting parties that they had particular relevance to developing economies. (Indeed, the category 'tropical products' is something of a misnomer; many products covered could equally be defined as temperate; for example, sugar is not included, but maize is). The category of tropical products (as defined by GATT) was chosen to receive maximum liberalization and early implementation of the agreed liberalization. Undertakings were made at the Mid-term Review (1988) by several developed countries (including the EC) to reduce tariffs on tropical products on most favoured nation (MFN) basis. In the Final Act, nominal tariffs on all tropical products were reduced by an average 43 per cent; tariffs on spices, flowers and plants were reduced by 52 per cent; and on tropical nuts and fruits by 37 per cent (equal to average reductions on agricultural products by developed countries (table 5)). As part of the Agreement on Agriculture, non-tariff measures on tropical products were eliminated.

Tropical products held particular interest for developing countries because of their share in total exports; this is most marked in least developed countries (22 per cent of merchandise exports, compared with 9 per cent for all developing countries). Some least developed countries rely on one tropical product for 50 per cent or more of export earnings (Gambia, Uganda, Malawi). In earlier GATT Rounds, tropical products received little attention, in keeping with the general neglect of agriculture. In consequence, some unique impediments to market access remain to be dealt with:

(i) Excise taxes are still levied on tropical products (coffee, cocoa);

(ii) Tariff escalation remains a major barrier to processing, while unprocessed products face zero tariffs.

The Uruguay Round outcome shows that tropical products achieved above-average reductions in import protection under the Agricultural Agreement (see table 1). However, tariffs on agricultural products remain significant in developed countries' markets (especially rice and tobacco) and further reductions are possible. In terms of proportional tariff reductions, imports of tropical products from developing countries continue to suffer from tariff escalation against processing of exports; most tariff reductions were similar across product stages, so little de-escalation of process protection occurred (GATT 1993). (This is not true of industrial and semi-industrial

products where tariff escalation diminishes substantially as a result of the Uruguay Round). Assessing the effects of MFN tariff reductions when many imported tropical products are subject to preferences in developed countries is almost impossible. The effects of the Uruguay Round liberalization on tropical products will depend on the individual characteristics of products, import markets and the presence of preferences.

GATT estimates suggest that some trade gains occur in all categories of tropical products for both MFN and generalized system of preferences (GSP) partners, with the biggest gains in rubber, tropical wood, tropical beverages and fruit and nuts. Special preference suppliers and least developed countries lose from trade diversion as a result of the Uruguay Round liberalization because their preferences are reduced by the MFN reductions. Overall, GATT estimates that developed countries' imports of tropical products expand by 2-3 per cent as a result of the Uruguay Round; an increase in value of $2 billion on 1990 imports of $87 billion.

Table 5. Tariff reductions by developed economies on agricultural product categories
(Millions of US dollars and percentages)

Product categories	Import value from:		Percentage reduction in tariffs
	All sources	LDCs[a]	
All agricultural products	**84,240**	**38,038**	**37**
Coffee, tea, cocoa, sugar, etc.	13,634	10,280	34
Frutis and vegetables	14,575	8,887	36
Oilseeds, fats and oils	12,584	6,833	40
Other agricultural products	15,585	4,233	48
Animals and their products	9,596	2,690	32
Beverages and spirits	6,608	2,012	39
Flowers, plants, vegetable materials	1,945	1,187	48
Tobacco	3,086	1,135	36
Grains	5,310	725	39
Dairy products	1,317	48	26
Tropical products	**24,022**	**18,744**	**43**
Tropical beverages	8,655	8,041	46
Tropical nuts and fruits	4,340	3,672	37
Certain oilseeds, oils	3,443	2,546	41
Roots, rice, tobacco	4,591	2,497	40
Spices, flowers and plants	2,992	1,987	52

Source: GATT (1993:36).
a LDC = least developed countries.

4. Assessment of the Agricultural Agreement

An evaluation of the main components of the Agreement depends on opinions about the significance of the new rules and disciplines affecting agricultural trade, as compared with the modest trade liberalization incorporated into the Agreement.

The new rules represent a major step towards stability through an effective dispute settlement procedure. Moreover, the commitments to tariffication and reductions in tariffs, subsidies and domestic support, combined with the 'peace clause', should reduce trade conflicts over the next five years. Adoption of tariffs as the only permitted border measure, subject to some limited exceptions, provides a sound foundation for future liberalization of agricultural trade; and the adoption of bindings on tariffs provides a degree of certainty which did not exist previously. Similarly, the standstill on export subsidies, with agreed schedules of reductions, and constraints on domestic supports represent revolutionary steps for GATT to discipline a wide range of policies affecting international trade. The SPS Agreement also closes another avenue for trade barriers. Taken together, these agreements so clearly represent progress that hopes for constructive international action on agricultural trade must be enhanced.

While the widespread adoption of tariff bindings, especially by developing countries, has ensured greater certainty for traders, in some cases the levels bound are well above actual rates. This is the case for some developing countries which have carried out significant unilateral trade liberalization over the past decade or so, for example, Indonesia. This adds a degree of uncertainty as applied tariff levels could be increased significantly and be GATT-legal. It also means that while the bindings will be reduced over time, actual rates may not change and hence there may be no benefit from future Rounds. In modelling the effect of the Round it is important to make sure that such situations are specified appropriately.

Pessimists argue that although the principles are important, Governments are already showing their intent by the high levels of original tariffication adopted in schedules and the cynical last-minute agreement by EC and United States negotiators to exclude production limitation schemes (set-asides) from the 20 per cent reduction in domestic support expenditures. Exclusion of production-limitation programmes means that this type of intervention is likely to become even more important in Western Europe and North America (Anderson, 1994). Some tariffication levels appear to be much higher than protection under the previous non-tariff measures. The agreement does not establish a procedure to verify new tariff levels,

which invites countries to inflate tariff equivalents. This may mean that effective import barriers could be higher at the end of the transition period. Alternatively, some countries are taking advantage of the agreed reduction of 36 per cent (24 per cent for developing countries) average unweighted reduction to apply the reductions selectively. Thus, not only may average protection of agriculture under the new tariff regime be higher, but also the distribution of protection may be altered to suit farmers' needs. Another source of discrimination is the allocation of the minimum access quantities which may be negotiated bilaterally with major suppliers (Tangermann, 1994).

These evasions are consistent with the recent complicity between United States and EC officials to minimise the real effects on agricultural output and trade. The contents of the 'green box' excluded sufficient instruments to allow major policies, such as cereals programmes, to continue. Because of developments in world agricultural prices and the 1992 CAP reform, the United States and EC producers will be forced to make few adjustments because of the 1986-1988 base levels adopted in the agreement. International food prices are expected to be considerably higher in the 1990s than their depressed levels in 1986-88. The United States and EC authorities, therefore, will not be constrained by the ceilings on domestic support or export subsidy expenditures, at least until towards the end of the phase-in periods.

There is still reason for optimism, however, because agriculture has been brought under GATT rules and transparency of agricultural protection has been enormously increased. Security and predictability for trade in agricultural products has greatly increased.

> The single most important feature of the Agreement is that it establishes a set of completely new and operational rules for policy towards agriculture...binding commitments have [been] accepted under international law. It is hard to overestimate the significance of this fundamental change (Tangermann, 1994).

Tariffication of non-tariff border measures in agriculture goes much further than has been achieved in industrial trade, and the domestic support and export subsidy commitments push the rules further into domestic policy formulation than the GATT has ever found acceptable before. The 1992 CAP reform and United States Farm Policy changes cannot be disengaged from the negotiations in the Uruguay Round. The trend has been to lower support prices and to reduce farm support outlays because of budgetary pressures. If this political pressure is maintained (and the constraints on domestic expenditures in the Uruguay Round agreement

will help), the next mini-round of GATT agricultural negotiations, due to begin in 1999, could see further liberalization based on the new bound tariff levels. Attention could also be focused on further cuts in export subsidy expenditures and on efforts to take crop support schemes out of the 'green box'.

The Uruguay Round Agreement on Agriculture provides a framework for countries to improve the trade system, if they wish. By applying complementary reforms in regional and domestic agricultural policies, in conjunction with other policies, the commitments will have genuine effect. But there is still scope to revert to protectionist strategies within the new framework, particularly in the interpretation of the agreement provisions. Agricultural policies in many small west European countries, which acceded to the EC in June 1994, are more restrictive than the CAP. Moreover, association agreements with central and eastern European countries have significant implications for EC agriculture. EC relations with Mediterranean countries and the Lomé countries (68 Asian, Carribean and Pacific countries) have heavy agricultural components. Agriculture has sensitive areas in the North American Free Trade Agreement (NAFTA) also. The effects of the new GATT agricultural regime on these preferential arrangements remains to be evaluated.

The Cairns Group of countries were only just able to accept the final agricultural agreement, which fell well short of their aspirations. Their main achievement was bringing agriculture into the GATT system. Only modest gains in export revenue are now anticipated, however. The Cairns Group still has a major role to play; first, to keep the major participants up to the mark on their commitments; second, to ensure that there is a thorough-going review of the Assessment in 1999; and third, to pursue further liberalization now that agriculture is part of the GATT process.

5. Erosion of trade preferences given to developing countries

Developing countries have received important trade preferences under the Organization for Economic Co-operation and Development (OECD) countries' GSP schemes and through preferences extended under the Economic Union Lomé Convention and the United States Caribbean Basin Initiative (CBI). Many GSP schemes extend even lower preferential tariffs than those received by other developing countries to the least developed countries. As the Uruguay Round agreements will lower trade barriers on an MFN basis, this will erode these countries' margins of preference and cause their preferential position against other suppliers to decline. They will experience some trade losses as some preference-receiving goods are displaced by exports from non-preference receiving countries. Most of these losses

will concern raw materials and foodstuffs as preference-receiving developing countries, particularly the least developed countries, export little in the way of manufactured goods.

These losses can be offset in two ways. First, as the Uruguay Round will liberalize market access in textiles and clothing to all developing countries, this provides the opportunity for the entry and expansion of manufacture and export of these commodities – the commodities first taken up by countries developing an industrial sector. Second, extensive studies by the World Bank (Thomas and Nash, 1991) document the important gains that can result from trade policy reform by developing countries which have extensive tariff and non-tariff barriers.

6. Implications of the Uruguay Round Agreement on Agriculture for countries in the ESCAP region

Some rifts opened between the developing countries during the agricultural negotiations. The Cairns Group attracted support from agricultural exporters, mainly middle-income countries. A competing group of food-importing countries had another voice in the negotiations at different stages; this group focused around Jamaica, Egypt, Mexico, Morocco, Peru, and Nigeria (assisted on occasion by India, the Republic of Korea and China).

The clash of interests arose because reductions in agricultural support in developed countries could be expected to raise world food prices (Anderson and Tyers, 1990). Agricultural production is effectively taxed and food consumption subsidized in many developing countries, not necessarily directly but via manufacturing protection policies and overvalued official exchange rates. OECD countries' agricultural policies, by creating surpluses, have lowered the relative prices of food, which discourages agricultural output in developing countries. Liberalization of agricultural trade policies will tend to reduce these surpluses and raise world prices. In this way liberalization of agriculture in the OECD, if accompanied by liberalization in developing countries, should improve agricultural efficiency and bring benefits all round. Higher world prices would provide a stimulus to domestic producers but the extent of response will depend on substantial support to provide new equipment, technologies and restructuring.

The ESCAP members of the Cairns Group (Fiji, Indonesia, Malaysia, Philippines, Thailand, as well as Australia and New Zealand) should be reasonably satisfied with the Uruguay Round outcome on agriculture (as outlined above). The new rules and disciplines should prevent new inroads being made into their export markets by subsidized exports. The

new rules and tariffication increase transparency, stability and predictability in agricultural markets. Several bilateral agreements are bound in the new GATT regime; for example, the Andriesson Assurance (the European Union undertook to refrain from exporting subsidized beef and dairy products to Australia's markets in Asia and the Pacific) and the European Union-Australia and United States-Australia bilateral quotas for dairy and meat products are bound under the market access commitments. In other areas these countries should gain increased market shares and potentially higher export prices, which will improve their barter terms of trade. By focusing attention on the potential of their agricultural sectors, the Agreement may also encourage some Governments to remove the bias against their agricultural sectors (for example, price controls, marketing agencies, credit restraints, etc). Already, liberalization of industrial trade in many Asian countries has reduced the cost disadvantages that afflict agricultural sectors under import-substitution strategies for development.

Agricultural importers faced with rising world prices will suffer some deterioration in their barter terms of trade. But the higher prices (plus some removal of policy-induced cost disadvantages) should promote domestic agricultural production. If significant increases in world food prices adversely affect the least developed countries, the Uruguay Round Decision on Measures in Favour of Least Developed Countries will cut in as a safety measure. In addition to providing technical assistance and export support, the decision calls for financial support if hardship is caused by rising prices for imported food. As well, participants agreed to establish mechanisms to ensure that the implementation of the Round does not adversely affect the availability of a sufficient level of food aid to meet developing countries' needs.

For those developing and transition countries which are undertaking economic reforms, including trade liberalization, the Uruguay Round agreements provide a very favourable environment. Over the next several years their access to developed country markets will be improving and they will have less competition from subsidized exports from developed countries. It will be up to them to take advantage of the opportunities made available. This is a different environment from that which faced countries undertaking economic reforms in the early 1980s, when trade barriers in developed countries against the exports of developing countries were being made more restrictive.

Of course, the implications of the Agricultural Agreement for economies in the ESCAP region, whether net importers or exporters of agricultural products, cannot be separated from other aspects of the Uruguay Round Final Act. The balance of effects from the Uruguay Round on

countries' terms of trade and growth performance depends on many unrelated circumstances. Industrializing economies stand to gain from liberalization of industrial trade and stronger disciplines on contingent protection providing more predictable and improved access to overseas markets for manufactured exports. These trade benefits offset any rise in imported prices of agricultural products and could, directly and indirectly, provide resources to strengthen domestic agriculture.

Several Cairns Group exporters anticipate export gains, as United States and EC subsidies and domestic supports are constrained. Improved access to markets in Japan and the Republic of Korea have particular interest, especially for rice. Some Asian members will gradually liberalize their markets for beef, grains and dairy products. Japan and the Republic of Korea will be markets of particular importance. This will offer greater export opportunities to Australia, Canada and perhaps some Latin American members of the Cairns Group. The Association of South East Asian Nations (ASEAN) countries should increase exports of tropical products, grains, fruits and vegetables, and vegetable oils.

It is impossible at this point to draw any general conclusions about the effects the Agricultural Agreement may have on trade and output in the ESCAP region. The agreed rates of reduction in support and protection for agriculture are limited in reality because of the 1986-1988 base-levels used in the agreements and ongoing reform in producer countries. Nevertheless, it is widely agreed that the main contribution is to bring agriculture back within GATT disciplines. Further negotiations and assessment of the Agreement on Agriculture are to begin in the fifth year of implementation. This is likely to be the acid test for commitments to the liberalization of world agriculture.

C. REVIEW OF MODELLING RESULTS

1. Introduction

Considerable quantitative analysis of agricultural trade liberalization has been carried out since the launch of the Uruguay Round of GATT trade negotiations in 1986. The analysis has deepened understanding of the consequences of agricultural protection and provided impetus to agricultural negotiations in the Round. For the first time in GATT history, agriculture has been included in multilateral trade liberalization. More detailed evaluations can now be undertaken to draw out the policy implications of agricultural agreements for individual countries and groups of countries.

Assessment of the Agricultural Agreements essentially involves quantifying the gains and losses to specific countries and regions resulting from agricultural liberalization, and within the countries and regions, assessing the impact on various interest groups, such as consumers and producers, and exporters and importers. It also entails analysis of the mechanisms which determine the consequences of trade liberalization for countries and interest groups. Needless to say, not all countries in the ESCAP region have been covered in the literature. This makes it important to examine the mechanisms of the trade liberalization process as defined in the analysis, so that general implications of agricultural liberalization can be drawn out for those countries that have not been included in the research to date.

This section provides an overview of the earlier quantitative assessments of the impact of agricultural liberalization. This review serves to highlight the major issues arising from agricultural liberalization, especially those that are important to the ESCAP region. The survey is not intended to be comprehensive, but rather focuses on the major studies and extracts the main findings and policy implications of the previous research. The section is organized as follows. The following section reviews the major issues arising from agricultural liberalization in the Uruguay Round, particularly those relevant to developing countries. Section 3 examines the models used for the quantitative assessment of trade liberalization and highlights the main strengths and weaknesses of different types of models. Section 4 summarizes the main findings from the earlier studies, and the final section draws conclusions from the survey.

2. Issues in agricultural liberalization

There is little doubt that the trade liberalization resulting from the Uruguay Round will improve global economic welfare (Goldin, Knudsen and van der Mensbrugghe, 1993; Nguyen, Perroni, and Wigle, 1991; Deardorff and Stern, 1990). How this global gain will be distributed among countries and regions is, however, a complex issue. This is particularly true with regard to liberalization of agriculture, where the interests of individual countries are diverse. Because most developed countries heavily protect their agricultural sector, standard trade theory suggests that, overall, they are likely to benefit from agricultural reform. OECD countries will save billions of dollars from reductions in their budgetary outlays for agricultural subsidies, while consumers will benefit from lower domestic prices. It is the producers in these countries who will lose from the reform. Their losses will, however, be much smaller than the gains to their Governments and consumers.

Among developing countries, those that are, overall, net agricultural exporters will benefit from the agricultural reforms, as reductions in agricultural protection in OECD countries will tend to allow the trend level of world prices to shift upwards. Lower border protection in developed countries will increase demand for agricultural commodities on the world market; reductions in export subsidies will reduce exports from developed countries; and reductions in production support will reduce the surplus output in North America and the European Union which is the underlying reason for the export subsidies in those countries.

Perhaps the most contentious issue, as far as the direction of the impact of agricultural reform is concerned, is on the economic welfare of net food importers; many of these are in the ESCAP region. If world prices rise following agricultural reform, the terms of trade for net food importers would deteriorate, as they would have to pay more for their imports. Whether net food importers will lose or not depends on the extent of the terms of trade deterioration, on the difference between the composition of their imports and exports, and on the extent of agricultural trade liberalization which they undertake. If, for example, a country is only a marginal net food importer, and its export prices increase substantially more than its import prices, the country may well gain from agricultural trade liberalization. Further, if a country undertakes reform of its agricultural sector, its food production may increase and its food imports may decline.

Any trade reform is unlikely to stop at the border, and its long-term effects can be far-reaching and widespread. First, producers in net food-importing countries and regions will respond to trade liberalization by increased agricultural output, so that part of the terms of trade effect can be offset. If the production response is such that they become net food exporters, then the chances are that they will gain from trade liberalization. This may appear unlikely except for marginal net food-importing countries and regions. However, if one looks back at history, this has indeed happened in non-marginal, food-importing countries and regions. Over the last three decades or so, some developed countries have turned from being large net food importers into large net food exporters (such as in the European Union), and for some developing countries the opposite is true (Tyers and Anderson, 1992, p.4).

Developing countries have been taking a smaller and smaller share of world food exports. This has resulted from three developments. The first is the increasing agricultural protection in developed countries, which has, as mentioned earlier, depressed world food markets. The second development is the discrimination of domestic policies against agriculture in developing countries (see Krueger and others, 1988). If developing

countries reduce or eliminate this discrimination, the situation can change drastically. The late 1970s witnessed a dramatic turn-round in China, where economic reform – including the improvement of the internal terms of trade for the rural sector – substantially boosted agricultural production and exports. The third development is that demand for food in most developing countries has been growing more rapidly than in developed countries because both population and income have been growing faster. Moreover, income elasticities of demand for food are higher in developing countries than in developed countries. In other words, consumers in developing countries spend proportionally more of their increased income on food than their counterparts in developed countries.

The Uruguay Round has provided a unique opportunity for developing countries to reform their policies which discriminate against agriculture. Reductions of export taxes would undoubtedly raise domestic prices for agricultural commodities, and tariff reductions in the non-agricultural sectors would improve the internal terms of trade for the agricultural sector. This favourable change in the internal terms of trade will be reinforced by a similar change in the international market, where trade liberalization in non-agricultural commodities will tend to lower the relative price of most industrial products. Agricultural reform in developing countries has been made politically easier by the Uruguay Round outcome because developed countries will reduce their protection on non-agricultural commodities, including that on textiles and clothing which is of great importance to many developing countries. Increased earnings from exports of industrial commodities can offset revenue losses to Governments as a result of domestic tariff reductions. Given the liberalization momentum that has built up in the last decade or so in a number of developing countries, and especially countries in the ESCAP region, agricultural reform has become an increasingly possible policy option.

Another important factor which must be taken into account when assessing the impact of agricultural reform on developing countries is the possibility of induced technological progress as a result of trade liberalization. There is growing evidence that there are substantial dynamic gains from trade liberalization (Dollar, 1990; Edwards, 1992). If such dynamic gains are tapped, more developing countries will gain from agricultural reform, and those which would gain even without the induced technological change will gain even more.

Nevertheless, for some resource-poor, heavy net food-importing developing countries, there is little chance that they will become net food exporters even with reform both at home and overseas. And even with induced technological change, there is no guarantee that they will not lose

from agricultural liberalization. The overall result depends on how strong the induced technological change is and how the technological change affects the country's terms of trade, if it is a large country. This is very much an empirical question, and has to be assessed using quantitative models. Before turning to the results from these models, however, one other possible benefit of agricultural reform should be mentioned, and that is the impact on the price instability of agricultural commodities.

Price instability in agricultural commodities has been a major risk for the global economy, and more so for the developing countries as agricultural exports are often very important and food consumption accounts for a much larger budget share of households in these countries than in developed economies. There are two causes of price instability. One is the effects of policy, the other is the result of natural events such as weather, pests, and disease. It has been a policy of both developed and developing countries to insulate their domestic food prices from fluctuations in world markets. Such insulation in turn increases the need for international prices to adjust to clear world markets. The increased price instability in world markets induces interventions by Governments to insulate domestic prices even further. It is obvious that price stability is a public good for the international community. If the Uruguay Round means less insulation of domestic prices – which is likely, as protection policies have often been designed for insulation purposes (such as variable import and export levies in the European Union) – there is an additional welfare gain from trade liberalization, especially for developing countries.

3. Types of models used for quantitative assessment of trade liberalization

Models used in the quantitative assessment of agricultural trade liberalization fall into two broad categories according to their coverage of markets: partial equilibrium (PE) and general equilibrium (GE) models. PE models normally deal with one or several commodity markets without including other markets in an economy or the global economy. Factor markets are often excluded in partial equilibrium models. Because of the exclusion of other markets, the linkages between the included and excluded markets are severed. It is therefore impossible to capture the interactions among different markets in the economy.

Obviously, the major weakness of partial equilibrium models is that they are unable to capture such feedbacks. For example, when a tariff reduction occurs, domestic prices of imported commodities fall, and hence consumption increases. However, the tariff reduction is also likely to lead

to a rise in real national income, which in turn will boost demand for imported commodities, assuming these commodities are normal goods. Apart from this income effect, some substitution effects are also likely to be omitted in partial equilibrium models. Although the most important substitutes for commodities included in the models are normally present in these models, the omission of a large number of other commodities may alter the behaviour of the model to a significant degree.

The main strength of partial equilibrium models is their focus (Winters, 1990). By concentrating on a subset of an economy, economists can do more detailed research on that sector, and hence build more sophisticated and realistic features into the models. This is reflected in a number of partial equilibrium models, such as Tyers and Anderson's grain, livestock and sugar (GLS) model (Tyers and Anderson, 1992), which incorporates commodity stocks and also includes stochastic aspects of world food markets. Another main advantage of partial equilibrium models is that their results are relatively easy to interpret. This is because the secondary effects of policy changes are absent from the results, leaving aside the complexities involved in tracing the interactions among different markets. Where the secondary effects of any policy changes are minimal, partial equilibrium models can be a very effective tool of analysis. Where the secondary effects are important, however, general equilibrium models should be used.

In principle, GE models include all markets of an economy, although some models do exclude factor markets (Martin, 1992; Trela and Whalley, 1990). It must be pointed out, however, that most GE models are so-called "real" models, as typically there are no money markets. Interactions between the real micro-economy and the nominal macro-economy are therefore excluded in most GE models. There have been recent attempts to link GE models with macroeconomic models (McKibbin, 1994). As in the case of PE models, this linkage may or may not be important, depending on the issues being addressed by the models.

The main weaknesses of PE models are precisely the main strengths of GE models. By being comprehensive, GE models are able to capture the overall effects of policy changes being studied, including feedbacks from other sectors. A rigorous theoretical basis is a typical feature of GE models. For example, income transfers in terms of taxes and subsidies can be traced using a GE model. Thus, GE models are internally consistent and impose desirable model properties from economic theory.

Being comprehensive is, however, not necessarily desirable in all circumstances. It can unnecessarily complicate a simple issue and

makes the results difficult to interpret. In addition, details of the sector of concern may get lost in the pursuit of comprehensiveness. More computing resources are also required as the dimensions of the model increases. Thus, there is a trade-off between being focused and comprehensive (Winters, 1990). GE and PE models are better treated as supplements rather than as substitutes for each other. Basically, the choice between the use of these two types of models depends on the issues to be addressed and the resources available for building and implementing experiments.

Models can also be classified into comparative static and dynamic models. The former category refers to models which focus only on the impact of policy changes on equilibrium situations, whereas the latter category captures the impact of policy changes in transitory periods as well as in equilibria. Similar to the trade-off between PE and GE models, comparative static and dynamic models have their advantages over one another in circumstances which suit them. For example, if one is interested in issues of short-run adjustment to a policy change, it is necessary to use a dynamic model. If, however, one's interest is in the long-term structural impact of a particular policy change, then a comparative static model may have an advantage over a dynamic model owing to its ease of interpretation.

4. Interpreting model results

Before detailing the results of previous studies of agricultural trade liberalization, some notes on how to interpret these results are perhaps desirable. Most studies present their results in the form of comparisons, rather than projecting the trend levels of economic variables. That is, results compare the magnitude of economic variables with and without policy changes. This is true for both comparative static and dynamic models. Figure 1 illustrates this point. In the absence of a policy change or if the policy continues at the historical trend, the variable concerned is assumed to evolve along the line AB and reach point B at time t_1. When a policy change is introduced at time t_0, however, the economic variable would follow path AC and reach equilibrium C at time t_1. With a dynamic model, the paths with and without the policy change are traced, so that the effect of the policy change over the period can be calculated as the difference between line AB and AC. With a comparative static model, only the difference between points B and C is calculated, and the effect of the policy change in the transitory period between t_0 and t_1 is not estimated.

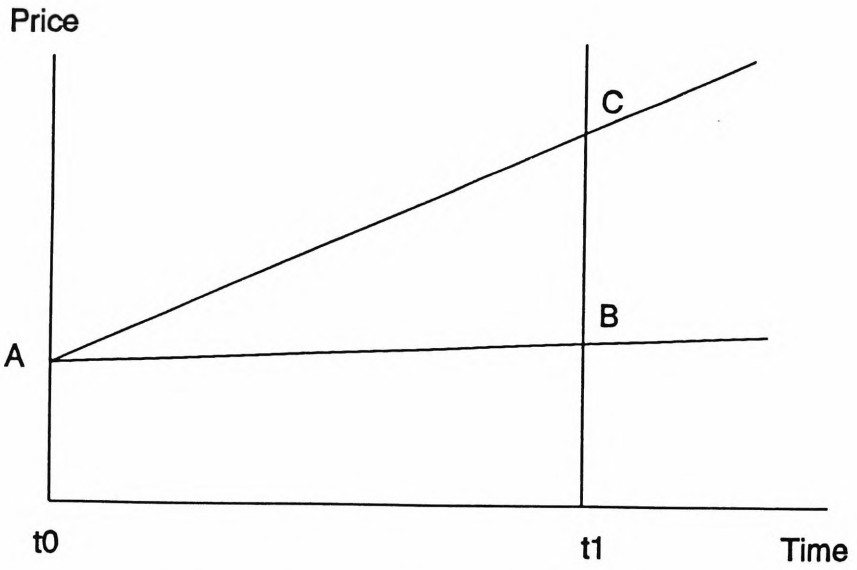

Figure 1. Interpreting modelling results

Suppose that a five per cent price increase is reported as the result of a comparative static simulation of a tariff reduction. Following the explanation above, this five per cent increase should be interpreted as an increase in the price above the level that would otherwise have prevailed without the tariff change. The increase should not be interpreted as a projection of a future price movement. The tariff reduction may lead to the price increasing by five per cent above the level it would otherwise be, but the absolute price level may actually rise by more or less than five per cent or may even fall, depending on other factors influencing it.

5. A review of model results

Most results now available from modelling research on agricultural liberalization are the results of research done before the conclusion of the Uruguay Round. Hence, policy changes introduced in these studies are considerably different from the outcome of the Uruguay Round negotiations. However, the economic issues that have been dealt with are the same after the conclusion of the Round. In what follows, we review the literature on the basis of issues, rather than policy experiments.

(a) World food prices

Perhaps the issue of most interest with respect to agricultural liberalization in OECD countries has been its impact on world food prices. On the one hand there are the exporters interested in how far the prices of their exports may increase. On the other hand, as a number of developing countries are net food importers, increases in world food prices can have substantial adverse impacts on them. The most intensive research into the issue is contained in a book edited by Goldin and Knudsen (1990a) which is based on an international symposium held in Paris in October 1989. In the symposium, leading agricultural economists presented their modelling results. The models used have been among the most influential in terms of their impact on policy makers and trade negotiators. Table 6 summarizes some of these results and identifies the main models. It should be noted that these results refer to the impact of full agricultural liberalization by OECD countries.

World prices for meat, dairy and sugar are projected to rise following full trade liberalization. Most models also project increases in the prices of other commodities. Rice and coarse grains are the two exceptions. While only the MTM model projects a price fall for rice, both the MTM and Zietz/Valdes models project a decline in the price of coarse grains. However, among the models which project the same direction of price change, there are large variations.

Given the different assumptions in the models, it is inevitable that results will differ. According to Goldin and Knudsen (1990b), several factors are important in contributing to the differences. First, the base years for the models are different. The Zietz/Valdes uses a base year of 1981-83 and the MTM model uses an average level of protection for 1982 to 1985, while the USDA/SWOPSIM has a base year of 1986. One of the important characteristics of agricultural protection in OECD countries is its variability owing to the widespread use of quantitative restrictions. Unlike tariffs, which provide constant protection measured in *ad valorem* terms, the magnitude of quantitative restrictions changes with demand and supply conditions. The differences in the base line of models can, therefore, lead to varying results. To some extent, therefore, these results measure the effect of OECD agricultural protection at different times.

Second, the treatment of the livestock sector in the OECD countries contributes importantly to the differences in the results for coarse grains. In all models, the livestock sector is highly supported before liberalization. Most models project falls in livestock production in OECD countries. This in turn leads to a decline in demand for coarse grains which are

Table 6. Price effects of full agricultural liberalization by Organization for Economic Co-operation and Development (OECD) countries

Model/commodities	Wheat[1]	Rice	Coarse grains	Meat	Dairy	Sugar
Partial equilibrium models						
Anderson-Tyers[2] (projected 1995)	25	5	3	43	95	22
Zietz and Valdes[3] (OECD countries)	3	2	-3	10	–	15
OECD/MTM[4] (OECD countries)	-5	–	-10	5	31	9
USDA/SWOPSIM[5] (1986 base)	27	18	16-22	16	84	29
General equilibrium models						
IIASA[6] (projected 2000)	18	21	11	17	31	–
RUNS[7]	15	14	8	18	–	57
WALRAS[8]	17	–	–	10	14	–

Source: Adapted from I. Goldin and O. Knudsen, "The implications of agricultural trade liberalization for developing countries", in I. Goldin and O. Knudsen, eds., *Agricultural Trade Liberalization: Implications for Developing Countries* (Paris, Organization for Economic Co-operation and Development, 1990) and A. Brandao and W. Martin, "Implications of agricultural trade liberalization", *Agricultural Economics,* No. 8, pp. 313-43. For original sources, see these two references.

Notes:

1 In some models other grains are included with wheat.
2 Partial price transmission. Meat is ruminant meat.
3 Meat projection is only for beef.
4 The Ministerial Trade Mandate (MTM) model of the OECD Agricultural directorate projects 10 per cent reductions. The numbers presented here are simple multiples of these to provide comparative 100 per cent reductions. Meat projections are averages of beef, poultry, pork and sheep price movements weighted by world production of these commodities. SWOPSIM is the Static World Policy Simulation Model of the US Department of Agriculture.
5 Meat is only beef and veal, dairy is butter (cheese value is 37, milk power 81, and fresh milk 0).
6 International Institute for Applied Systems Analysis.
7 Rural Urban North South (model).
8 World Agricultural Liberalization Study (of the OECD).

mainly used as animal feeds. Unlike other models listed in the table, the MTM model includes forage and non-grain feed sectors. The cross-elasticities among various types of feeds are high. As the production of livestock output falls following liberalization, the induced demand for feeds declines substantially, causing a decline in their prices. The fall in feedgrain prices also leads to increased production of food grains, depressing the prices for these commodities. Goldin and Knudsen argue that the cross-price effects are perhaps exaggerated in the MTM model, but at the same time point out the importance of the livestock sector in agricultural reform.

In comparison with partial equilibrium models, general equilibrium models (ITASA, RUNS, and WALRAS) project more consistent results for food prices. In addition, GE models also project much more muted price responses to liberalization. This is probably because GE models allow interactions between the agricultural and non-agricultural sectors. Economy-wide resource constraints and substitution help dampen the response of the agricultural sector to reform.

Overall, complete liberalization seems to exert upward pressure on world agricultural prices for most commodities, especially the heavily protected commodities, meat, dairy products, and sugar. With the elimination of their protection, production falls in the OECD countries. The induced output response in developing countries is unable to fully offset the upward pressure on world prices. As most developing countries are small importers of these products, the adverse effects of OECD liberalization on their terms of trade are perhaps not as great as one might have expected. Grain prices may also rise, but to a lesser degree. The grain price increases reflect the dominant position of the OECD countries in the world food markets for most temperate commodities. Because of the greater importance of grains to developing countries, the impact of the price increases may be large. In most studies the price of rice is projected to rise to a lesser degree than other grains. This result reflects the dominance of developing countries in the world rice market, and their response to reform outweighs the production contraction in OECD countries.

One final factor needs to be taken into account in interpreting the results presented in table 6. While production support in the OECD countries may increase agricultural output, the land set-aside programmes in the United States and Japan have the effect of reducing agricultural output. As the set-aside issue is not dealt with in the Uruguay Round, it is potentially possible that the land set aside can be brought into production as production support diminishes. Whalley and Wigle (1990) show that once this is taken into account, the overall United States commodity programmes can have a negative impact on United States wheat production.

The implication of this finding is that some agricultural prices may not rise following liberalization, or price increases can be damped. Brandao and Martin (1993) show, however, that the implementation of a 20 per cent reduction in the land set-aside together with liberalization has only a marginal effect on world prices.

Table 7 presents results on world food prices resulting from trade liberalization of agriculture in both industrial and developing countries. The policy reform leading to these results involves the complete elimination of positive agricultural protection in OECD countries and both positive and negative protection in developing countries. Developing countries tend to provide protection to their agriculture in terms of tariffs and input subsidies, while at the same time imposing taxes on agricultural exports. However, over-valued exchange rate policies and higher non-agricultural protection often means that the overall internal terms of trade discriminates against agriculture.

Taking into account the liberalization of these policies in developing countries, the results for global liberalization contrast sharply with those of OECD liberalization alone. The effect on rice is clearly reversed, with the negative protection in the developing countries outweighing the positive effect from the developed countries. The impacts of developing country liberalization on other commodities are less clear. All one can generalize is that more models project reversed or damped effects, although even this generalization may not apply to dairy products. If one believes in this tendency in the shift of the results, it can be concluded that developing countries liberalization tends to mitigate the upward pressure on world prices. The implication of this conclusion is that net food-importing developing countries are less likely to lose and net exporters are more likely to gain. This is consistent with the welfare results from the models, to be discussed shortly.

The above studies are largely confined to temperate products. Regions as diverse as the ESCAP region have an interest in a much wider spectrum of commodities. Two more recent studies, by Brandao and Martin (1993) and Goldin, Knudsen and van der Mensbrugghe (1993), using an extended version of the RUNS model, provide good coverage of tropical commodities and cash crops (table 8). It is interesting to present the results from these two studies because they used the same model and database but implemented slightly different reform scenarios.

Table 7. Price effects of liberalization by both OECD and developing countries
(percentage)

Model/commodities	Wheat[1]	Rice	Coarse grains	Meat	Dairy	Sugar
Partial equilibrium models						
Anderson-Tyers[2] (projected 1995)	1	-25	-7	8	60	-12
Zietz and Valdes[3] (OECD countries)	-12	-21	-24	13	–	1
OECD/MTM[4] (OECD countries)	-7	-5	-12	-4	29	7
USDA/SWOPSIM[5] (1986 base)	23	–	8-19	7	79	7
General equilibrium models						
IIASA (projected 2000)	23	–	13	11	34	–

Source: Adapted from I. Goldin and O. Knudsen, "The implications of agricultural trade liberalization for developing countries", in I. Goldin and O. Knudsen, eds., *Agricultural Trade Liberalization: Implications for Developing Countries* (Paris, Organization for Economic Co-operation and Development, 1990) and A. Brandao and W. Martin, "Implications of agricultural trade liberalization", *Agricultural Economics*, No. 8, pp. 313-43.

Notes:
1 In some models, other grains are included with wheat.
2 Partial price transmission. Meat is ruminant meat.
3 Meat projection is only for beef.
4 The Ministerial Trade Mandate (MTM) model of the OECD Agricultural directorate projects 10 per cent reductions. The numbers presented here are simple multiples of these to provide comparative 100 per cent reductions. Meat projections are averages of beef, poultry, pork and sheep price movements weighted by world production of these commodities.
5 Meat is only beef and veal, dairy is butter (cheese value is 37, milk power 81, and fresh milk 0).

In the Brandao and Martin study, tariffs and tariffied non-tariff border protection are reduced by 36 per cent from their 1986-1988 levels for developed countries; budget outlays on export subsidies are reduced by 36 per cent; and there is a 20 per cent reduction in domestic support. Developing countries liberalize by two thirds of the extent of liberalization undertaken by industrial countries. In contrast, the Goldin and van der Mensbrugghe study only considers a 30 per cent reduction in tariff equivalents (negative protection in developing countries is also reduced by the same extent) and a 30 per cent reduction in all agricultural input subsidies. As can be seen in table 8, the two studies project the same trends for most commodities except for rice, coffee, cocoa and other food products. In addition, the Brandao and Martin study projects price increases for all commodities.

Clearly the extent of trade liberalization can greatly affect the outcome for individual commodities. The reduced negative protection in developing countries is able to reverse the direction of price change for some of the commodities most important to developing countries. Rice is extremely important to most Asian economies; coffee and cocoa are two major export commodities for Latin American and African countries, as well as for some Asian countries. Comparison of the results from these two studies highlights the great influence policy changes in developing countries can exert on the prices of some commodities. As reductions of negative protection are not a requirement of the Uruguay Round, the outcome of world prices can be affected by unilateral trade reforms of some developing countries. In the case of rice, for example, if China and Thailand decide to reduce their export tax on the commodity, the trend of world prices would be altered significantly.

Table 8. World price impact of the Dunkel Draft-based agricultural liberalization
(percentage)

	Brandao and Martin	Goldin, Knudsen and van der Mensbrugghe
Wheat	6.3	5.9
Rice	4.2	-1.9
Coarse grains	4.4	3.6
Sugar	10.2	10.2
Beef, veal and sheep	6.1	4.7
Other meats	3.2	1.0
Coffee	0.4	-6.1
Cocoa	0.1	-4.0
Tea	2.3	3.0
Oilseeds	4.5	4.1
Dairy	10.1	7.2
Other food products	0.7	-1.7
Wool	2.0	2.0
Cotton	2.2	3.7
Other agriculture	2.2	5.9

Source: A. Brandao and W. Martin, "Implications of agricultural trade liberalization for the developing countries", in *Agricultural Economics*, No. 8, pp.313-43.

(b) Welfare effects

The welfare effects of trade liberalization can be decomposed into four components: efficiency gains from resource re-allocation, terms of trade effects, any second-best welfare effects arising from changes in tax revenues, and if trade liberalization also leads to more rapid technological change, as suggested by endogenous growth theories (for example, Romer, 1990; Grossman and Helpman, 1991), then there can also be an efficiency gain from technological progress. Indeed, as we will see later, these induced technological changes can make a great difference to the outcome of liberalization.

Table 9 presents results from two reasonably comparable studies on the welfare effects of agricultural liberalization (see Brandao and Martin, 1993). It is desirable to present the results from these two studies because they envisage different long term impacts of trade liberalization on agricultural performance. The Krissoff and others study evaluates only the conventional efficiency gain, terms of trade effects and change in government revenues, whereas the Anderson and Tyers study also intends to capture the effect of induced technological change arising from trade liberalization.

It is not surprising that in both the industrial country and global liberalization scenarios, the Anderson and Tyers study projects much larger global gains. Also very much as expected, industrial countries unambiguously benefit from agricultural liberalization in all scenarios. A quick glance at the Krissoff and others results suggests that without induced technological change, as many developing countries lose as those that gain from industrial country liberalization alone. Developing countries as a group would be about $5 billion worse off. In fact, only the following countries gain: India, Pakistan, Thailand, Argentina, other Latin America, South Africa and eastern Europe. If developing countries also participate in trade liberalization, most countries gain, and developing countries as a whole gain just over $2 billion. Not surprisingly, those which still lose are the large net food importers.

In contrast, the Anderson and Tyers models results by incorporating liberalization-induced technological change project that most developing countries will benefit from agricultural liberalization even if this only occurs in industrial countries. The extension of trade liberalization to developing countries would double the benefits to developing countries and further reduce the number of countries losing from trade liberalization. Those that continue to lose are heavy net food importers and these incur only relatively small losses. Clearly, induced technological change can have a substantial impact on the outcome of trade liberalization.

One issue worth further study is how strong the induced technology may be. There is considerable evidence to support the notion that more open economies tend to outperform more closed and distorted economies. The implication of this literature is that conventional methods tend to underestimate the benefits of trade liberalization. However, most endogenous growth theories tend to suggest that the largest induced efficiency gain is likely to occur in the manufacturing sector, especially in industries where economies of scale and imperfect competition are prevalent (Grossman and Helpman, 1991). It is also argued that manufacturing activities involve more learning by doing, and more open trade regimes encourage this learning process through international linkages. Nevertheless, one should not underestimate the impact of price incentives on agricultural production in the long run. As mentioned earlier, if China's experience of rural reform is of any guide, trade liberalization can indeed be very powerful in stimulating production.

Two recent modelling studies have more explicitly incorporated endogenous efficiency gains in the evaluation of the Uruguay Round trade reforms (Francois, McDonald and Nordstrom, 1994; Yang, 1994). In the Francois and others study, economies of scale and imperfect competition are incorporated. Also present in their model is the so-called medium-term dynamic effect (Baldwin, 1989, 1992), which captures the investment expansion effect of trade liberalization. Yang takes a different approach by incorporating export externalities which have been found to generate substantial benefits to countries following outward-oriented trade policies. Both studies show that these market imperfections imply substantial extra benefits to liberalizing economies. The Francois study projects that these extra benefits can be several times as large as the conventional benefits if the market access reform resulting from the Uruguay Round is implemented. Similarly, the Yang study suggests that the overall benefits of the Uruguay Round could double, although this would be less so for agricultural since he assumes the externality effect is much smaller for agriculture.

(c) Price Instability

As mentioned earlier, price instability in world agricultural markets has a lot to do with protection policies in both industrial and developing countries. Only a few studies have addressed the issue quantitatively. Using the stochastic version of their model, Anderson and Tyers (1992) have shown that trade liberalization will substantially reduce price instability. This finding supports the theoretical insight into the issue, but more empirical work is clearly needed to deepen the research.

Table 9. Welfare effects of agricultural liberalization

	Krissoff and others		Anderson and Tyers	
	Industrial (1986 $ million)	Global (1986 $ million)	Industrial (1985 $ million)	Global (1985 $ million)
Bangladesh	-40	-24	-200	100
China	-69	-76	2,900	12,900
India	335	1,746	1,300	1,100
Indonesia	-105	119	400	900
Korea, Republic of	-385	1,490	-900	6,500
Pakistan	50	317	300	400
Philippines	-27	67	0	-100
Taiwan Province of China	-273	-58	-200	400
Thailand	195	346	500	-200
Other Asia	-325	-166	500	1,700
Subtotal Asia	-644	3,761	4,600	23,700
Argentina	532	637	5,400	5,100
Brazil	-432	406	2,900	800
Mexico	-59	505	1,200	900
Other Latin America	162	716	3,200	800
Subtotal Latin America	204	2,264	12,700	7,600
Egypt	-442	-181	–	–
Nigeria	-28	24	-300	400
South Africa	19	152	600	200
Other Sub-Saharan	-64	-54	1,300	2,100
Other North Africa and Middle East	-2,184	-2,211	-2,300	-600
Subtotal	-2,699	-2,270	-700	2,100
Eastern Europe	691	729	–	–
Former Soviet Union	-1,373	-1341	–	–
Rest of the world	-1,164	-1083	–	–
Subtotal developing	-4,985	2060	166,600	33,400
Industrial countries	33,128	33,065	46,500	73,300
World total	28,133	35,125	62,200	106,400

Sources: A. Brandao and W. Martin, "Implications of agricultural trade liberalization for the developing countries", in *Agricultural Economics*, No. 8, pp.313-43.

B. Krissoff, J. Sullivan, J. Wainio and B. Johnston, "Agricultural trade liberalization and developing countries", ERS Staff Report, AGES 9042, USDA Economic Research Service, Washington, D.C.

K. Anderson and R. Tyers, "More on welfare gains to developing countries from liberalizing food trade", in *Journal of Agricultural Economics*, 44 (2): 189-204.

Notes: The commodity coverage of the Krissoff and others study is slightly broader than for Anderson and Tyers because the latter consider only temperate products: wheat, coarse grain, rice, ruminant meat, non-ruminant meat, dairy products and sugar. Krissoff also include oilseeds, cotton and tobacco. Neither study considers the tropical beverages, of prime importance to many developing countries. The Krissoff study measures welfare changes by combining impacts on producer surplus, Marshallian consumer surplus, and direct government revenues relative to a 1986 baseline. Anderson and Tyers measure welfare changes in 1985 dollars using producer surplus, Hicksian consumer surplus, and direct government revenues.

However, while trade distortions may amplify fluctuations in world prices, there is a question as to how important this is relative to other destabilizing factors. Duncan (1990) argues that the trade policy-induced price instability may not be very important. This argument is supported by the experience in other commodity markets, where the absence of significant trade distortions has not been associated with price stability. In agriculture, natural disasters can have major impacts on price stability, and their impact can easily dominate any other factors. The message is that trade liberalization is certainly conducive to price stability, but one has to pay greater attention to other destabilizing factors to project price movements.

6. Conclusions

In the framework of standard trade theory, net food-importing developing countries tend to lose from agricultural liberalization in industrial countries. The key to understanding the issue is the changes in world prices of agricultural commodities. Trade liberalization in industrial countries will exert upward pressure on these prices. Developing countries as a whole are likely to lose since they import more than they export. Heavy net food importers tend to lose more. This projection is largely supported by the empirical research based on the same theory.

Even in the conventional framework, however, if developing countries also participate in trade liberalization, the likelihood that they will lose from the Uruguay Round is substantially reduced. This is because, the gain from reducing their own distortions offsets at least some of their potential losses from industrial country liberalization. In addition, the reduced discrimination against agriculture will boost their exports and mitigate the upward pressure on world prices. As a result, the adverse terms of trade effect on net food importers is reduced. Recent studies suggest that developing countries as a whole are likely to gain from agricultural liberalization, although possible losses for heavy net food importers cannot be ruled out.

If technological progress is generated from trade liberalization, as economists increasingly believe is the case, there is a greater chance that most developing countries will benefit from the Uruguay Round. Participation in agricultural reform and improvement in agricultural technology are, therefore, two powerful instruments to overcome any possible adverse effect of trade liberalization, and increase the economic well-being of developing countries in the long run.

D. MODELLING THE IMPACT OF THE URUGUAY ROUND AGRICULTURAL AGREEMENT

1. The GTAP model

The GTAP model used in this study was developed by Tom Hertel of Purdue University in the United States, and its database is drawn from the SALTER model developed by the Industries Commission of Australia. The original model covered 24 countries/regions and 37 commodities. In this study, we have used a 17x15 version of the model (17 commodities and 15 countries/regions), a matrix which gives good coverage of individual countries/regions of the ESCAP region and provides regional aggregates for most of the rest of the world. The economies/ regions shown separately are Australasia, China, Hong Kong, Japan, the Republic of Korea, Indonesia, Malaysia, Philippines, Singapore, South Asia, and Thailand. These are the only ESCAP countries/regions for which the necessary sets of data are presently available in the GTAP database (see table 10 for a full listing of countries/regions in the model).

The GTAP is a comparative-static, general equilibrium model of the global economy. Other models of this type include Whalley's (1985) model of world trade, the Michigan model of world production and trade (Deardorff and Stern, 1986), the RUNS model (Goldin, Knudsen and van der Mensbrugghe, 1993), the WALRAS model (Burniaux and others, 1990) and the SALTER model (Zeitsch and others, 1991). Like the GTAP model, these models include full general equilibrium features of individual economies and link these economies through international trade. Some (for example, the latest version of SALTER) also have linkages through international capital markets.

In each of the economies, the activities of economic agents (consumers, producers and governments) are modelled according to economic theory. In the GTAP model, an individual economy is represented by a single 'super-household'. This household disposes of total national income according to a Cobb-Douglas per capita utility function specified over three forms of final demand: private household expenditure, government expenditure and savings. This means that national income is spent in fixed proportions in these three areas. Government expenditure is also distributed on the basis of constant budget shares among composite goods and services, which are composed of domestically produced and imported goods and services. Domestic and imported goods and services are treated as distinctive products in the concept of the Armington assumption of product differentiation (Armington, 1969). The demands for domestically

produced and imported goods and services are determined by their relative prices and the level of the demand for the composite goods and services according to CES (constant elasticity of substitution) functions. Similarly, demand for imports from a particular foreign supplier is also determined in the CES fashion by the level of imports from all sources and the relative prices of the goods and services from this particular source.

Private households allocate their expenditure on various composite commodities according to the so-called CDE (constant difference of elasticity) function. This functional form is used to capture the non-homothetic nature of private household demand because income elasticities for different commodities vary. Once the demand for composite goods and services is determined, CES functions are again used to determine import levels and their sourcing from individual foreign suppliers.

On the supply side, producers are assumed to be profit-maximizing. There is perfect competition and constant returns to scale. Gross output is composed of value added and a composite intermediate input, and demand for both of them are proportional to output levels (Leontief technology). Value added is in turn composed of labour, capital and land (for agricultural use only), and demand for them is governed by CES functions. Similarly, the composite intermediate input is made up of those produced domestically and imported, and their substitution is determined by CES functions. Demand for imports are sourced again according to CES functions. It should be noted that labour and capital are perfectly mobile across industries, while land is only partially mobile. This implies that wages and rental prices are equalized across industries while land prices can vary from industry to industry.

Apart from goods and services sectors within national boundaries, there are two global sectors in the model. One is the global transport sector which provides services to individual countries. Transport costs make up the differences between the cost, insurance, freight (C.I.F.) and free on board (F.O.B.) prices of traded commodities. The other global sector is the banking sector. This sector intermediates between global savings and investment. The level of investment is determined by the expected rate of return to investment. The change in the expected rate can be assumed to be either equal across countries or variable according to the economic circumstances being modelled.

2. Modelling the Uruguay Round Agricultural Agreement

The Agricultural Agreement in the Uruguay Round has three major components. First, non-tariff barriers (NTBs) are to be converted to

their tariff equivalents and both the converted NTBs and previously bound or applied tariffs are to be reduced – by 36 per cent on average for industrial countries and 24 per cent for developing countries, with a minimum reduction of 15 per cent for each tariff line. Second, the budget outlay on export subsidies is to be reduced by 36 per cent, and the volume of subsidized exports is to be reduced by 21 per cent for industrial countries and 15 per cent for developing countries. Third, domestic support for agricultural production is to be reduced by 20 per cent for developed countries and 15 per cent for developing countries.

In the simulations to follow, we have assumed that the *ad valorem* rates of tariffs (including both those converted from non-tariff barriers and existing ones) are reduced by 36 per cent for industrial countries and 24 per cent for developing countries. This is how reduction in border protection should be implemented according to the agreement. Some simplification was required to implement the reductions in export subsidies and production support as these reductions are measured in value and quantity terms and cannot be readily captured by the model. Following Brandao and Martin (1993), the reductions in export subsidies and production support were approximated by 36 per cent reductions in the rate of export subsidies and 20 per cent reduction in the rate of production support, respectively, for industrial countries. For developing countries, two thirds of the industrial country reductions were implemented.

Based on GATT (1994) estimates, tariffs on industrial goods other than textiles and clothing were reduced by about 40 per cent on average in industrial countries, and tariffs on textiles and clothing were reduced by 21 per cent for items imported from developing countries and by 19 per cent for items imported from industrial countries. Developing countries' tariffs were reduced by two thirds of the industrial country reductions. The Multifibre Arrangement (MFA) was phased out over time by reducing its export tax equivalent to zero.

The tariffication estimates used in the modelling exercise may lead to an over-estimate of the gains from the Uruguay Round for the reasons given in Section B. In some cases, tariff levels are bound above actual rates and while the bindings will be reduced the actual rates may not be. In other cases there may be "water" in the tariff so that reductions will not have any effect. The tariffication process is not subject to verification, so that tariff rates adopted may be higher than the effective rate of existing restrictions. Also the scope for applying reductions selectively to commodities within the agreed average reduction may mean that some commodities in some countries may experience smaller cuts in protection than agreed.

An important aspect of modelling the Uruguay Round trade reform is the form of model closure. The model closure describes the economic environment in which economic agents (government, consumers producers, etc.) conduct their activities. The impact of exogenous shocks (such as trade liberalization) obviously depends on the economic environment. For example, whether wage rates are flexible or not will affect the outcome of liberalization on output expansion. If real wages are fixed, most of the impact of trade liberalization on the labour market will fall on employment.

In the experiments conducted in this study, all prices and quantities are endogenous in the model, except supplies of factors of production (labour, capital and land) and the price of savings (the numeraire). The expected rate of return to investment is set at 10 per cent, making investment not very responsive to the rate of return.

3. Patterns of existing agricultural protection

Agricultural protection data in the GTAP model are detailed in Hertel (1994). The rates of production taxes, the levels of tariffs and tariff equivalents of non-tariff barriers, and the export taxes used in the model here are shown in tables 10, 11 and 12. Here, only a brief overview of the protection pattern is provided to aid the interpretation of the simulation results to be presented in the next section.

Industrial economies as a whole subsidize agriculture, including meat and milk products. Australia and New Zealand have, however, only limited subsidies for their agriculture. Among developing countries, the Republic of Korea, Indonesia, Thailand, Latin America, Sub-Saharan Africa, South Asia and the "Rest of the World" provide production subsidies to agriculture. Agricultural subsidies seem to be at high levels in the Republic of Korea, Latin America and the "Rest of the World", while they are at low levels in Indonesia, Thailand, Sub-Saharan Africa, and South Asia. Both industrial and developing countries tend to tax industrial production.

Border protection (tariffs and the tariff equivalents of non-tariff barriers) on agriculture is very high in industrial countries except in Australia, New Zealand and the Republic of Korea. Most other developing countries also protect their agriculture, but to a much lesser extent. Industrial country protection is concentrated in temperate zone grain crops and livestock products. Developing countries can be broadly divided into three groups according to the pattern of their tariff protection. The Republic of Korea, the Philippines, Latin America, Sub-Saharan Africa, South Asia and the "Rest of the World" tend to protect all agricultural commodities, whereas

Indonesia, Malaysia, Thailand and China tend to protect commodities other than rice and wheat. The third group, Hong Kong and Singapore, has, of course, insignificant protection.

Only North America and the European Union have sizeable subsidies on agricultural exports. These subsidies are largely concentrated in grain crops and livestock products. Most developing countries tax their agricultural exports rather than subsidize them. It must be noted, however, that the export tax data in table 12 are by no means complete. Some restrictions are obviously omitted. In the case of China, for example, some agricultural exports to Hong Kong are subject to quotas (World Bank 1988), yet there are no agricultural export tax equivalents shown in the database. The complete absence of export restrictions for several countries in table 12 suggests that much more needs to be done toward improving the export tax/subsidy data.

Among industrial goods, textiles and clothing are subject to relatively high tariffs in both industrial and developing countries. Most developing countries have high tariffs on manufactured goods, but China, the Philippines and Thailand seem to have the highest. The high export taxes on textiles and clothing reflect the restrictions of the MFA, which are modelled as voluntary export restraints in the GTAP model. It should be noted that the magnitude of these taxes does not accurately reflect the extent of the restriction as these are averages over all export destinations. Obviously, other things being equal, countries whose exports are concentrated in industrial countries have higher average export tax rates. China, South Asia and ASEAN countries are in fact the most severely restricted if only exports to North America and the European Union are considered.

4. Simulation results

Five simulation exercises were conducted, based on the 1992 version of the GTAP database:

(E1) Industrial country agricultural liberalization as agreed in the Uruguay Round;
(E2) Global agricultural liberalization as agreed in the Uruguay Round;
(E3) Global liberalization of all agricultural distortions;
(E4) Complete Uruguay Round trade liberalization;
(E5) Complete Uruguay Round trade liberalization with induced technological change.

Table 10. Production taxes
(percentage)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-25.1	-3.5	-9.2	-33.6	-4.5	0.0	2.2	0.0	-2.2	0.9	0.0	-50.8	246.0	-5.8	-2.5
Wheat	-12.9	-3.9	-12.9	0.3	0.0	0.0	2.2	0.0	0.0	1.0	0.0	-10.0	8.2	4.6	-2.2
Other grain	-14.3	-3.2	-14.1	-7.5	-9.6	0.0	2.2	0.0	0.3	2.6	0.0	-18.2	2.0	18.3	-20.3
Non-grain crops	-29.2	-1.9	-32.8	-26.8	-1.9	0.0	2.5	1.8	-0.4	4.3	0.0	11.1	-8.9	-2.8	-36.7
Wool	-7.7	-2.8	0.0	0.1	0.0	0.0	0.8	0.0	0.0	0.8	0.0	-0.2	0.6	0.8	1.1
Other livestock	-6.8	-1.3	-0.5	-12.9	0.5	0.0	1.8	2.2	0.1	0.9	0.0	-2.0	0.8	-1.0	-7.0
Forestry	1.1	2.3	2.3	0.6	0.7	0.0	5.3	0.0	2.1	10.3	0.0	0.4	8.9	10.3	1.6
Fishery	0.1	4.0	2.7	0.1	0.5	0.0	3.5	0.2	0.6	4.7	0.0	1.0	4.1	4.7	1.5
Processed rice	0.1	0.7	0.0	0.3	1.0	0.0	0.7	0.0	1.4	4.8	0.0	0.7	3.3	4.8	0.8
Meat	-0.9	0.7	1.3	1.7	0.8	0.0	2.3	1.4	0.8	2.5	0.0	0.2	2.0	2.5	0.8
Milk products	-1.1	3.9	-6.7	-16.6	1.1	0.0	4.6	0.7	3.2	8.0	0.0	0.4	4.0	-11.3	-4.4
Other food products	0.2	0.8	0.9	6.1	1.2	0.0	2.0	0.7	1.5	3.7	0.0	-0.8	2.6	3.7	1.0
Beverages and tobacco	9.8	0.9	86.6	109.7	17.3	0.0	16.2	0.4	70.0	31.0	0.0	15.0	26.4	31.0	47.6
Minerals	2.9	1.4	2.8	-0.2	0.2	0.0	9.5	0.0	6.3	8.1	0.0	1.3	10.0	8.7	3.3
Textiles and clothing	0.8	1.1	2.0	1.3	1.4	0.0	1.7	0.6	2.8	8.5	0.0	1.6	7.4	8.5	1.6
Other manufactures	1.5	0.9	4.1	2.9	-1.4	0.0	6.7	0.5	4.8	12.0	0.0	1.3	10.9	12.3	2.6
Services	3.7	2.4	3.3	4.1	2.2	0.0	3.1	2.2	2.4	8.2	0.0	2.8	5.8	8.5	3.3

Source: GTAP (Global Trade Analysis Project) database.

Note: Negative entries are production subsidies.

Acronyms: NAE: North America and European Union; AUS: Australia and New Zealand; JPN: Japan; KOR: the Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Table 11. Import tariffs and tariff equivalents of non-tariff barriers
(percentage)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	116.2	2.4	352.5	317.2	0.0	0.0	50.0	0.0	0.0	0.0	0.0	16.4	2.8	2.1	2.4
Wheat	33.1	0.0	490.8	5.0	0.0	0.9	10.0	0.0	0.0	1.0	0.0	5.6	5.5	8.0	16.2
Other grain	45.3	1.4	463.4	403.4	7.8	0.2	20.3	0.0	19.5	10.1	0.0	17.8	11.2	3.8	55.8
Non-grain crops	44.0	7.4	95.8	382.1	66.5	1.9	37.7	0.0	60.4	24.2	0.0	10.3	9.9	10.3	16.5
Wool	1.1	1.8	0.0	10.0	5.0	2.0	20.0	0.0	30.0	15.0	0.0	7.6	5.1	5.2	6.0
Other livestock	40.3	2.1	57.7	49.5	7.6	2.2	20.6	0.0	10.8	34.7	0.0	6.6	9.4	8.8	9.0
Forestry	0.0	0.2	0.1	5.0	14.6	5.6	10.0	0.0	16.4	10.1	0.0	9.1	1.4	0.5	3.2
Fishery	5.2	1.2	5.0	22.2	29.3	4.7	17.4	0.0	57.2	36.0	0.0	22.7	7.9	4.4	7.7
Processed rice	75.4	2.8	350.9	316.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	15.3	11.8	10.9	11.6
Meat	37.8	11.2	57.7	49.5	30.0	1.0	34.5	0.0	54.1	45.4	0.0	12.2	12.8	6.6	12.0
Milk products	122.0	33.1	343.8	123.0	27.7	1.4	15.7	0.0	23.1	35.5	0.0	15.5	14.1	12.0	17.8
Other food products	10.4	7.0	9.1	17.1	20.0	13.6	22.1	0.2	49.7	29.4	0.0	18.8	12.6	12.3	12.8
Beverages and tobacco	11.6	6.6	11.7	73.6	24.0	1.0	45.0	0.0	59.5	96.8	0.0	11.0	6.4	3.1	10.0
Minerals	0.5	0.3	0.8	4.8	1.2	2.1	18.7	0.0	18.2	9.8	0.0	4.7	6.1	4.2	3.5
Textiles and clothing	15.6	17.3	11.9	18.3	28.3	22.3	39.8	0.5	59.5	65.9	0.0	19.5	12.6	13.2	12.3
Other manufactures	9.3	18.8	4.1	17.1	13.0	8.6	22.2	0.5	33.0	28.8	0.0	15.5	11.0	10.0	10.4
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.2	0.0	0.0	0.0

Source: GTAP (Global Trade Analysis Project) database.

Acronyms: See table 1.

Table 12. Export taxes
(percentage)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-24.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wheat	-28.6	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Other grain	-20.9	2.2	0.0	0.0	0.0	22.4	0.0	0.0	0.0	0.0	0.0	2.2	2.8	0.0	7.3
Non-grain crops	-7.7	0.3	0.0	0.0	0.0	18.5	0.0	0.0	0.0	0.0	0.0	-0.3	0.1	0.0	0.7
Wool	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.1	0.0	4.9
Other livestock	-0.2	0.8	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2
Forestry	0.0	0.1	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Fishery	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Processed rice	0.4	0.2	0.0	0.0	0.0	186.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Meat	-25.8	1.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	-0.4	0.1	0.0	0.2
Milk products	-46.8	-5.3	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	-2.8
Other food products	-0.5	0.6	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0	0.0	2.7	2.2	0.0	7.0
Beverages and tobacco	17.0	7.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	6.2
Minerals	0.8	1.3	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.2	0.0	0.7	0.0	0.0	0.1
Textiles and clothing	0.1	1.5	0.0	6.4	22.1	56.4	34.3	7.8	15.4	12.7	8.5	16.2	0.0	29.0	6.9
Other manufactures	0.9	0.7	1.2	0.2	0.0	5.2	0.0	0.0	0.0	0.1	0.0	0.2	0.4	0.3	0.7
Services	-0.2	0.4	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Source: GTAP (Global Trade Analysis Project) database.

Note: Negative entries are export subsidies.

Acronyms: See table 1.

In what follows, we discuss the impact of all these reform scenarios on world prices, country economic welfare and terms of trade. The impact of complete Uruguay Round trade liberalization (experiment 4) on trade, production, employment and factor returns is also analysed subsequently.

(a) Agricultural prices

Our first experiment (E1) essentially provides a check on the results of the previous studies reviewed in the previous sectioin. When only industrial countries liberalize their agriculture as required by the Uruguay Round agricultural agreement, world prices indeed increase for nearly all agricultural commodities, confirming the results of previous studies (table 13). The largest price increases are seen in rice, wheat, other grains and livestock products. The magnitudes of these price increases are not strictly comparable with those surveyed in Section C because of the partial liberalization nature of this experiment. If we assume the impact of trade liberalization to be proximately linear and multiply our results by a factor of three, which makes our border liberalization just over one hundred per cent, the magnitudes of price changes are quite similar to those obtained by other general equilibrium models.

When developing countries also participate in agricultural trade liberalization as agreed in the Uruguay Round (E2), the direction of price changes for all commodities is the same as for E1, and the size of the changes are limited. This result is not surprising given that direct agricultural interventions tend to be small in developing countries in comparison with those in industrial countries.

Contrary to the results of previous studies, however, developing country liberalization puts slight upward pressure on world agricultural prices, rather than dampening price rises. Developing countries generally increase production following the reform, and this leads to export expansion, exerting downward pressure on world prices. However, agricultural protection in developing countries mainly takes the form of tariffs, and when these tariffs are reduced, imports increase, putting upward pressure on world prices. On balance, agricultural trade liberalization in developing countries leads to slightly higher world prices than in E1.

If developing countries choose to liberalize their agricultural sectors more than is required of them by the Uruguay Round agreement (E3), price increases in world markets will be mitigated. Direct agricultural interventions other than those covered by the Uruguay Round are limited to a few moderate production and export taxes. The mild effect of reductions in these taxes reflects these limited distortions and the relatively small

share of developing countries in the world market. Nevertheless, this extended reform is significant enough to reverse the sign of price changes for several commodities, namely, forestry, other food products and beverages and tobacco.

If agricultural reform proceeds before reforms in other areas, the above three experiments provide a reasonable representation of the likely effects of the Uruguay Round on world agricultural prices. Given that agricultural reform in industrial countries is to be implemented over a six-year time period from 1995 to 2000 – shorter than the period for tariff dismantling and the MFA phase-out – it is quite possible that the impact of industrial country agricultural reform will be felt first. Thus, our results indicate the price effects of the Uruguay Round reforms by around the turn of the century.

Table 13. Impact of agricultural reform scenarios on world prices (C.I.F.), various scenarios
(percentage change)

	E1	E2	E3	E4	E5
Rice	6.9	7.8	7.7	8.1	8.5
What	10.4	10.5	10.4	10.0	10.5
Other grain	6.8	7.2	7.0	7.1	7.6
Non-grain crops	3.4	3.9	3.5	4.4	5.2
Wool	2.8	3.0	2.6	2.8	2.8
Other livestock	1.5	1.5	1.4	2.0	2.3
Forestry	0.2	0.2	-0.5	1.7	2.5
Fishery	0.3	0.3	0.0	0.6	1.6
Processed rice	1.0	1.5	0.9	2.9	2.9
Meat	5.0	5.1	4.9	4.9	4.8
Milk products	12.8	13.1	12.8	12.8	12.7
Other food products	0.7	0.6	-0.3	0.6	1.1
Beverages and tobacco	0.2	0.2	-6.4	-0.2	0.5
Minerals	0.2	0.2	0.3	0.1	1.2
Textiles and clothing	0.3	-0.2	-0.2	-9.4	-8.0
Other manufactures	0.0	0.0	0.0	-0.3	0.4
Services	0.1	0.1	0.0	0.1	1.1

Source: Simulation results.

Notes: (E1) Industrial country agricultural liberalization as agreed in the Uruguay Round;
(E2) Global agricultural liberalization as agreed in the Uruguay Round;
(E3) Global liberalization of all agricultural distortions;
(E4) Complete Uruguay Round trade liberalization;
(E5) Complete Uruguay Round trade liberalization with induced technological change.

Over the longer term, however, when other reforms – especially the phasing out of the MFA – take effect, there will be considerable interactions between agricultural and non-agricultural reforms. The net effect of the complete Uruguay Round package on world agricultural prices may be significantly different from the results presented above. This hypothesis was tested by the experiment (E4) which simulates the impact of the complete Uruguay Round reform. Overall, reforms in the non-agricultural sectors tend to amplify the price effects of agricultural reform without reversing the signs of any price changes resulting from the Uruguay Round agricultural reform alone (E2). The largest impact of non-agricultural reform is seen in textiles and clothing, where world prices decline considerably when the MFA is phased out.

The scenario looking at the impact of induced technological change as a result of the price increases (E5) sees, in general, a further strengthening of the effect of non-agricultural reforms on agricultural prices. The technological change introduced in this experiment results in a one per cent increase in total factor productivity across the board. The experiment thus assumes that once the Uruguay Round trade liberalization has taken its full effect, the productivity of the global economy is one per cent higher than it would otherwise be. Since the productivity change introduced is 'neutral' in the sense that the efficiency of all sectors of the world economy is increased by the same proportion, no changes in the direction of world prices are expected. The impact of the induced technological change should be felt most in the welfare effects on the world economy, as will be seen shortly.

(b) Welfare effects

As discussed in the previous section, import prices are only one of the several factors determining the welfare outcome of trade liberalization for individual countries. Despite the increases in world agricultural prices, the economic welfare of most countries of the ESCAP region in our model improves following agricultural reforms in industrial countries (see EI in table 14). The only losers are the Republic of Korea and Singapore, all of which are heavy net food importers. (The Rest of the World losses are largely influenced by the outcome for the economies in transition and the Middle East and North Africa region included in this aggregate. The economies in transition include countries of the former Soviet Union and Eastern Europe). Developing countries as a group (including the economies in transition) would lose in the order of $1.8 billion. The largest loss is incurred in the "Rest of the World", and this loss is likely to be borne mostly by the economies in transition as they tend to be heavy net food importers. By and large, these results confirm the conclusions of previous

studies. One notable difference is that most Asian developing countries gain from agricultural liberalization in industrial countries.

One of the frequently overlooked issues in the analysis of the effect of agricultural trade liberalization on developing countries has been what happens to export prices. As explained in the previous section, it is true that if a country is a heavy net food importer, especially if it does not export much in the way of agricultural commodities, there is little chance that it will gain from trade liberalization. If, however, a country's terms of trade improves as a result of greater increases in its export prices than in its import prices, its welfare losses will be minimized, and the country may even gain. Perhaps somewhat surprisingly, most developing countries experience a terms-of-trade improvement following trade reform in industrial countries (E1 in table 15). Those whose terms of trade does not improve are again heavy net food importers, namely, Hong Kong, Japan, Singapore and the "Rest of the World", and even for these countries the losses are relatively small except for the "Rest of the World" (E1 in table 14).

Although the participation of developing countries in agricultural trade liberalization does not exert a strong impact on world prices, it has a critical impact on their welfare. They gain $3.3 billion from global agricultural liberalization as agreed in the Uruguay Round (E2 in table 14). This is a more than $5 billion improvement from the scenario in which they do not participate in trade reform (E1). Countries in the ESCAP region fare particularly well, gaining a further $3 billion from developing country agricultural reform. Their participation in trade liberalization is mainly to their own benefit, rather than to industrial countries. South Asia is the only exception. The deterioration in their terms of trade from E1 is responsible for the welfare loss for South Asia. For countries which lose from industrial country liberalization, their losses are reduced considerably by their own reform, and in the case of the Republic of Korea, it becomes a large beneficiary as a result of the reduction of its heavy agricultural protection. Korean consumers would benefit substantially from cheaper and increased food imports.

The terms-of-trade effects of developing country liberalization seem to be quite small, both on themselves and industrial countries (one needs to compare E2 with E1 in table 15 to see this). In fact, several economies, namely, the Republic of Korea, Malaysia, Singapore and Hong Kong, see an improvement in their terms of trade. This reinforces the rationale for liberalization in developing countries. That is, liberalization is in the interest of developing countries themselves, and the terms-of-trade effect of liberalization is not a reason for maintaining a protectionist policy.

Table 14. Welfare effects (equivalent variation) of agricultural trade liberalization scenarios
(Millions of US dollars at 1992 prices)

	E1	E2	E3	E4	E5
Australasia[1]	1,070	1,204	1,173	807	7,767
Japan	4,428	4,370	7,485	31,333	107,795
Republic of Korea	-439	2,219	2,587	3,644	9,520
Indonesia	99	265	230	2,302	5,412
Malaysia	135	194	106	2,864	4,671
Philippines	26	46	45	304	1,428
Singapore	-82	-52	-55	-245	1,114
Thailand	314	482	461	-1,192	2,033
China	26	-63	-48	2,448	14,965
Hong Kong	-195	-23	74	418	-274
Latin America	1,437	1,840	1,688	-211	25,047
Sub-Saharan Africa	-118	-105	926	-535	2,923
South Asia	10	-86	-68	-556	7,921
Rest of the world[2]	-3,026	-1,431	-344	-6,257	53,185
Subtotal: ESCAP region	5,392	8,555	11,989	42,128	162,353
Subtotal: developing[3]	-1,812	3,284	5,601	2,974	127,946
World	19,238	24,108	28,763	84,124	539,292

Source: Simulation results.

Notes: (E1) Industrial country agricultural liberalization as agreed in the Uruguay Round;
(E2) Global agricultural liberalization as agreed in the Uruguay Round;
(E3) Global liberalization of all agricultural distortions;
(E4) Complete Uruguay Round trade liberalization;
(E5) Complete Uruguay Round trade liberalization with induced technological change.

1 Australasia refers to Australia and New Zealand in this table and all subsequent tables.

2 This largely consists of developing countries and economies in transition.

3 This consists of all non-industrial countries/areas, i.e. the total minus industrial countries, Australasia and Japan.

Table 15. Terms-of-trade effects of trade liberalization scenarios
(per cent change)

	E1	E2	E3	E4	E5
Australasia	1.15	1.29	1.24	0.07	0.17
Japan	-0.23	-0.23	-0.12	1.77	1.65
Republic of Korea	-0.06	-0.03	0.03	-1.82	-0.96
Indonesia	0.19	0.14	0.10	-2.33	-1.52
Malaysia	0.22	0.28	0.16	-3.09	-2.76
Philippines	0.27	0.19	0.16	-3.54	-2.36
Singapore	-0.09	-0.06	-0.06	-0.23	-0.45
Thailand	0.52	0.50	0.39	-4.59	-2.69
China	0.19	0.07	0.08	-4.27	-2.55
Hong Kong	-0.22	-0.02	0.07	0.58	-1.87
Latin America	0.51	0.48	0.40	-0.81	-0.88
Sub-Saharan Africa	0.42	0.36	0.59	-0.29	-0.41
South Asia	0.38	0.30	0.32	-3.78	-2.83
Rest of the world	-0.01	-0.13	-0.08	-0.76	-0.83

Source: Simulation results.

Notes: (E1) Industrial country agricultural liberalization as agreed in the Uruguay Round;
(E2) Global agricultural liberalization as agreed in the Uruguay Round;
(E3) Global liberalization of all agricultural distortions;
(E4) Complete Uruguay Round trade liberalization;
(E5) Complete Uruguay Round trade liberalization with induced technological change.

If both industrial and developing countries jointly liberalize agricultural trade beyond what they agreed in the Uruguay Round (E3), the efficiency of the world economy will further improve, and the incremental welfare gain to developing countries is over $2.3 billion (table 15). The lion's share of this gain goes to Sub-Saharan Africa and the Rest of the World, where a number of agricultural commodities have been heavily taxed. There are probably many more distortions which discriminate against agriculture in developing countries than have been incorporated in our model. The implication of this is that we may have substantially underestimated the potential benefits of agricultural reform in developing countries.

As mentioned earlier, one of the most important distortions is the high protection for the non-agricultural sector, which acts as a tax on the agricultural sector (Stoeckel and others, 1989). The impact on agriculture of reductions in this protection, as required by the Uruguay Round is, however, not obvious in our results. (However, it should be noted that much of the discrimination against agriculture has come from over-valued exchange rates.) Table 14 shows that tariff reductions in the non-agricultural sectors lead to a welfare loss for developing countries as a group, largely

as a result of a heavy loss to the "Rest of the World". The aggregate welfare measure, however, does not indicate the extent to which non-agricultural reform benefits agriculture. The welfare loss from non-agricultural reforms seems to result from two factors. When the MFA is eliminated, developing countries lose quota rents they previously enjoyed. Previous studies show, however, that most developing countries benefit from the MFA phase-out despite the loss of quota rents (Trela and Whalley, 1990; Yang, 1994). The key factor is the terms-of-trade effect of tariff reductions. The strong terms of trade effect under the Armington assumption is responsible for the losses resulting from tariff reductions (table 15). Sensitivity analysis shows that if the Armington elasticities are doubled, which implies products from different countries are more homogenous than assumed in the model, developing countries as whole will gain $28 billon, and the global welfare gain would be around $150 billion. Fewer developing countries would lose. Given the critical importance of this elasticity assumption, it is an area in which further research is needed.

The ESCAP region is a large beneficiary of the Uruguay Round reform. The region as a whole gains US$42 billion, accounting for half of the global gain. China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines and the Republic of Korea, all benefit from the reform, whereas other countries in the region suffer losses from adverse terms of trade effects. It must be noted here that these results should be treated with caution as they do not take into account the effect of the likely technological change arising from the Uruguay Round trade liberalization. Thus, the results in table 15 should be interpreted as partial effects of the Uruguay Round reform.

Although the incorporation of induced technological change has strong empirical support, the particular value of an annual one per cent productivity increase that we used is not based on empirical estimates. This experiment (E5) was, however, not intended to produce robust numerical results. Rather it was meant to show how a small improvement in productivity that may flow from the Uruguay Round can alter the outcome of trade liberalization. The Uruguay Round is claimed to be most successful in rolling back quantitative restrictions in agriculture and textiles and clothing (GATT, 1994). Its impact is likely to be much wider than that arising from the more efficient re-allocation of existing resources. If the less quantifiable parts of the Uruguay Round agreement are taken into account, such as the strengthened dispute settlement mechanisms, and agreements in TRIMS and TRIPS, one may well expect that the Round will provide a boost to the world economy through greater investor confidence, including in research and development. It is, therefore, not entirely unimaginable

that the Uruguay Round can speed up world technological change significantly.

If the one per cent productivity gain eventuates, the global welfare gain will rise to nearly $540 billion, nearly six and a half times the gain from the scenario without induced technological change. Moreover, all countries gain. This result contrasts sharply with the outcome of the scenario without technological change, where some countries lose from the Uruguay Round reform. While it is unrealistic to believe that all countries would have their productivity boosted by one per cent as a result of the Uruguay Round reform -as some countries may be able to do better than one per cent and others may achieve much less- it is likely, however, that domestic reform in addition to a more favourable global market will significantly boost technological change if appropriate policies are put in place.

Without emphasising particular numerical results, this last experiment highlights the importance of agricultural productivity and productivity in general. The Uruguay Round is undoubtedly important to many developing countries, but in the longer run technological change can be much more powerful in improving the economic welfare of developing countries. If countries in the ESCAP region can use the Uruguay Round reform as an opportunity to foster technological change in their economies, they will be able to reap great benefits from the Round.

(c) Effects on trade

While the price effects of agricultural liberalization have received a great deal of attention, its impact on agricultural trade volumes has not been analysed in detail. The common perception is that when agricultural prices rise, demand for agricultural imports remain unchanged so that import bills have to increase. Simulation results (from experiment 4) in table 16 show that this is unlikely to be the case. While industrial countries as a group increase their net imports of most agricultural commodities as they cut back their domestic supports and widen market access (by $12 billion according to table 16), developing countries which have only moderate direct interventions reduce their net imports (by $8.4 billion). This results from both increased exports and reduced imports following trade liberalization. Although a number of economies increase their net agricultural imports, only Hong Kong and Singapore experience an increased overall trade deficit or reduced surplus.

Net agricultural imports by the ESCAP region increase by about $11 billion. This largely results from the substantial increase in Japan's net imports. Most developing countries have moderate increases in their

net imports. When non-agricultural trade is taken into account, however, the ESCAP region has a $50 billion reduction in net imports. Increases in textile and clothing exports from the region are the main contributor to the reduced net imports. Thus, most developing countries are in a better position to finance their agricultural imports despite the increases in prices.

Changes in bilateral trade flows of agricultural commodities as a result of the complete Uruguay Round trade liberalization are detailed in the annex. The table shows the changes in these flows in the format of a trade matrix. The rows show imports and the columns show exports. For example, the first row of the table indicates rice exports by North America and the European Union to various countries and regions. The last column in this row shows the total exports of rice by North America and the European Union to all destinations (the world). Similarly, the first column shows imports of rice by North America and the European Union from all sources, and the last row in this column indicates the total imports by North America and the European Union from all sources (the world). It should be noted that the numbers shown in the table include only bilateral trade flows, while exports to the global transport sector are omitted. This, should, however, not affect the results markedly as agricultural exports to the global transport sector are typically very small compared with bilateral flows.

As far as rice is concerned, Australasia, China, South Asia and Thailand in the ESCAP region have significant increases in rice exports. Most increases in world rice exports are absorbed by North America and the European Union and Latin America. Rice imports in Japan and the Republic of Korea's only increase marginally. Hong Kong's exports are largely re-exports.

Increases in world wheat exports are largely from Australasia, Latin America, South Asia, China, Japan and Thailand. Most of these export increases are destined for Japan, North America and the European Union, and the Republic of Korea. Most economies in the ESCAP region reduce their wheat imports. Only Hong Kong, the Republic of Korea and Singapore increase their wheat imports.

Australasia, China, and Thailand are the major beneficiaries from the export expansion in other grains (corn, etc.). North America and the European Union, Japan, the Republic of Korea and Latin America absorb the bulk of the export increases. Latin America increases its net exports despite considerable increases in imports. Most Asian countries also increase their imports slightly. Malaysia and China are the only two countries which experience a substantial decline in imports of other grains.

Most countries increase their exports and net exports of non-grain crops substantially. Japan, the Republic of Korea and Malaysia are the exceptions. Most increases in exports go to North America and the European Union, Japan, the Republic of Korea, China and the "Rest of the World". North America and the European Union, however, increase their net exports of non-grain crops.

It may appear surprising that world wool exports shrink. This is because world trade in wool is little subject to distortion. When global trade liberalization occurs, consumers substitute away from wool as it becomes more expensive. The elimination of the MFA is unable to offset the substitution effect. The decline in world wool exports results largely from the contraction in wool exports by North America and the European Union and Japan. Most other countries in the ESCAP region increase their imports of wool. Australasia is the main loser in the world wool market because of the decline in exports.

All Asian countries except Malaysia increase their exports of other livestock products. North America and the European Union, Japan and the Republic of Korea experience large increases in net imports.

Exports of forestry products decline in all countries except Australasia, and all countries increase their imports and net imports except Australasia. Japan, the Republic of Korea, Thailand and China have the largest increases in imports. North America and the European Union also substantially increase their exports and net exports of forestry products.

Exports of fishery products decline in all countries except Australasia, Japan and Thailand. As a result, most countries increase their net imports of fishery products, including Japan. Apart from Japan, the Republic of Korea, Thailand, China Malaysia and the Philippines also see considerable increases in their net imports of fishery products.

Australasia, Thailand, China and South Asia, are the main beneficiaries of the expansion in the world market for processed rice. North America and the European Union also increase their net exports. Japan and the Republic of Korea have large increases in net imports. Latin America also increase its net imports. While it is not shown separately, Viet Nam is an important rice exporter and will benefit from any expansion in rice trade.

As expected, Australasia is the largest beneficiary of trade liberalization in the world meat market. China and Thailand also increase their exports and net exports considerably, while other countries increase

their net imports. Japan and the Republic of Korea are again large net importers. North America and the European Union have the largest increase in net imports, thanks to both a decline in exports and an increase in imports.

Changes in the world market for milk products are similar to meat products, but Australasia is the only region which has significant increases in net exports. Most other countries except Japan and the Republic of Korea have marginal changes in their net imports. The largest increase in net imports occurs in North America and the European Union, where exports decline sharply and imports increase substantially.

Most countries experience declines in net exports of other food products, including Australasia, Thailand, China and South Asia. Japan and the Republic of Korea, by contrast, increase their net exports, as does North America and the European Union. Like the world wool market, the pattern of change in the world market for other food products is largely a result of general equilibrium effects. That is, in the traditional agricultural exporting regions, such as Australasia and Thailand, resources are drawn away from this sector as other agricultural sectors expands. In the heavily protected countries, resources released from other sectors make the other food product sector more competitive.

North America and the European Union substantially increase their exports of beverages and tobacco products. Significant net export expansion also occurs in Singapore, Latin America and the "Rest of the World". Most economies in the ESCAP region have a considerable increases in net imports, especially Japan, the Republic of Korea, China and Hong Kong.

(d) Effects on production, employment, wages and land prices

One of the frequently overlooked aspects of agricultural liberalization is its impact on rural incomes in developing countries. It is true that higher agricultural prices will reduce the living standards of the urban poor in developing countries. At the same time, however, the abolition of the MFA is expected to provide substantial compensation for the urban poor by increasing their opportunities of employment. However, most poor people live in rural areas. Therefore, the evaluation of the impact of agricultural liberalization on agricultural production, wages, and employment is of interest for its impact on income distribution.

Our results (of E4) in Table 17 show that although production declines in a number of agricultural commodities in developing countries,

most developing countries increase their production of temperate crops and livestock products, especially meat and milk products. Much of the increased output comes as a response to higher domestic prices transmitted from international markets, as well as from reductions in taxes on domestic production and exports and reductions in industrial tariffs which lower the cost of agricultural production. The increases in agricultural production are very small, and in Malaysia production of most agricultural commodities declines. This is largely because the expansion of the textile and clothing sector, following the removal of the MFA, draws considerable resources away from the agricultural sector, thus dampening production expansion in agriculture. Japan and the Republic of Korea are the only two countries where agricultural production contracts substantially. One should be aware, however, that this contraction occurs to the benefit of their economies. This is because resources are released from their less efficient agricultural sectors to the more efficient non-agricultural sectors.

Changes in agricultural production will eventually translate into changes in rural wages or employment, or both (table 18). It is noticeable that the expansion of the textile and clothing sector occurs at the expense of employment in a number of agricultural sectors. However, as in the case of the impact of the MFA reform on agricultural production, this is unlikely to have any adverse effects on rural incomes as expansion in employment in the textile and clothing sector will absorb rural labour. In fact, incomes for rural labour may well increase as wages rise economy-wide. While increases in wages, and employment in some cases, will reduce poverty in many developing countries, increases in land prices will also help small landholders (table 19). Overall, agricultural liberalization represents a welfare improvement for rural economies in most developing countries. Only countries which have heavily protected their agriculture at the expense of other sectors of their economies may see their agricultural sectors adversely affected by the Uruguay Round reform.

5. "Open" versus "closed" regionalism

The world economy has become increasingly interdependent as a result of increases in trade and investment flows across national borders. Such interdependence allows countries to specialize in the production of commodities in which they have a comparative advantage and import others at lower real resource cost from elsewhere in the world. Trade restrictions lead to deviations from the international trade pattern that would result from nations following the principle of comparative advantage, and reduce economic welfare for individual economies and the global economy as a whole. To maximize the benefits from trade liberalization, the best way to

Table 16. Changes in net imports following the Uruguay Round agricultural trade liberalization (E4)

(Millions of US dollars at 1992 prices)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	ESCAP	DIN	WLD
Rice	63	-2	0	0	0	0	0	0	-3	0	0	11	-5	-15	-43	-20	-55	7
Wheat	718	-142	401	9	-4	-10	-16	1	-2	-180	1	-184	-127	-42	-437	15	-992	-14
Other grain	-358	-84	730	284	12	-16	0	2	-9	-263	1	-99	-77	1	-3	657	-167	121
Non-grain crops	4,914	-526	3,251	829	861	39	-60	-7	-353	-392	-6	-3,900	-1,307	-280	-898	3,355	-5,475	2,164
Wool	-254	182	-12	73	1	2	1	0	1	34	8	3	0	6	-53	295	76	-8
Other livestock	350	-100	251	459	15	27	16	-14	15	14	22	-49	-34	21	-726	726	-235	266
Forestry	-440	-47	73	38	9	387	13	0	40	79	4	-10	15	-3	-103	593	469	55
Fishery	-670	-135	858	166	193	115	101	1	66	337	42	-189	-41	94	-798	1,838	87	140
Processed rice	-84	-13	17	16	9	2	1	1	-7	-11	7	51	7	8	16	32	100	21
Meat	2,314	-644	860	138	-1	10	6	-7	-94	-90	11	-987	-83	-2	-1,247	187	-2,345	184
Milk products	2,009	-847	422	40	-1	-7	5	-36	-4	4	-5	-269	-33	15	-1,256	-414	-1,547	36
Other food products	-909	90	-48	-855	66	526	394	-4	56	735	51	-664	76	267	473	1,278	1,122	254
Beverages and tobacco	-1,437	38	1,190	260	58	60	139	-130	28	421	64	-161	-149	32	-61	2,161	562	353
Subtotal: agriculture	6,216	-2,232	7,993	1,456	1,220	1,137	600	-193	-265	687	199	-6,448	-1,757	101	-5,137	10,703	-8,400	353
Minerals	-2,484	-1,092	1,764	332	2,049	1,502	98	-21	467	454	82	-507	-104	785	-2,954	6,420	2,183	372
Textiles and clothing	98,347	657	3,435	-10,741	-15,522	-28,344	-3,529	-179	-4,261	-33,066	230	1,357	858	-13,425	11,058	-104,744	-95,562	6,876
Other manufactures	-19,411	3,960	-9,438	2,481	3,666	6,377	218	132	337	11,495	1,028	5,339	1,040	4,893	-1,531	25,149	35,475	10,587
Services	-28,568	-977	4,424	1,710	451	1,782	556	278	106	245	2,722	-998	-58	1,159	-4,242	12,454	3,709	-21,412
Total	54,101	316	8,178	-4,763	-8,136	-17,547	-2,056	17	-3,616	-20,185	4,260	-1,257	-20	-6,487	-2,806	-50,017	-62,595	0

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world; ESCAP: ESCAP countries; DIN: developing countries; WLD: World.

Table 17. Effects of the Uruguay Round agricultural trade liberalization on production (E4)

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-5.6	6.4	0.0	-1.0	0.2	-3.3	-1.1	5.8	-0.1	-0.1	21.9	-1.3	-0.2	-0.3	0.3
Wheat	-2.9	7.2	-46.0	19.3	1.9	-10.1	-8.5	6.3	12.5	0.9	7.7	4.9	8.1	-0.1	8.7
Other grain	-0.6	11.6	-51.9	-38.0	-1.3	-4.8	-5.4	7.7	1.6	0.1	5.9	1.0	1.1	-0.5	-0.1
Non-grain crops	-5.8	6.8	-11.6	-13.4	-2.1	0.2	0.6	4.2	6.4	3.3	15.4	5.4	7.4	2.8	0.8
Wool	-7.9	-4.8	19.1	-3.4	56.2	-14.5	-11.7	16.4	-8.5	-10.2	-1.5	-1.2	-3.2	-7.1	-0.1
Other livestock	-1.5	8.2	-3.3	-7.7	1.4	-0.8	-1.4	2.6	0.3	1.8	1.1	1.3	-0.4	0.9	2.6
Forestry	1.0	0.9	-0.1	-6.9	-5.4	-18.9	-2.8	2.0	-4.9	-2.7	49.4	-0.5	-1.2	-1.4	0.5
Fishery	1.4	6.7	-1.3	-0.9	-5.7	-5.9	-3.7	-2.1	-3.6	-4.4	-4.8	1.7	0.2	-2.3	2.6
Processed rice	0.1	5.9	0.1	-0.6	0.1	-5.2	-1.1	5.0	-0.2	-0.4	-10.7	-1.3	-0.5	-0.7	0.1
Meat	-1.2	6.3	-1.6	-1.1	0.1	-0.4	-0.7	8.8	1.5	-0.3	8.5	1.7	1.5	-0.9	2.0
Milk products	-2.3	16.6	-7.0	-3.9	15.6	2.5	-1.3	25.5	0.4	-1.6	16.2	1.9	5.4	-5.1	6.7
Other food products	-0.1	-0.3	1.4	7.0	-0.5	-10.3	-6.3	2.5	-2.1	-3.6	2.8	0.6	-1.4	-2.0	-0.3
Beverages and tobacco	0.8	-0.6	-0.8	-4.4	-1.1	-2.9	-7.5	27.9	-2.0	-3.4	6.6	0.2	1.1	-1.1	-0.2
Minerals	1.0	3.7	-1.7	-4.5	-14.4	-24.0	-14.2	-2.6	-14.8	-6.2	-6.5	-0.3	-0.3	-8.4	1.2
Textiles and clothing	-20.0	-9.5	-2.2	49.5	158.0	697.4	115.7	53.9	24.7	27.8	13.9	-2.4	-11.9	22.9	-9.7
Other manufactures	0.5	-4.8	0.8	-0.3	-8.0	-18.4	-2.2	-0.2	-2.7	-6.4	11.1	-1.6	-3.3	-4.2	-0.1
Services	0.4	0.1	0.2	-0.1	0.6	-0.9	-1.5	-0.8	-0.8	-0.1	-3.2	0.0	-0.5	-0.7	0.0

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Table 18. Effects of agricultural trade liberalization on employment and wages (E4)

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-6.3	8.9	-3.1	-7.7	-1.4	-7.3	-1.6	8.5	0.6	0.2	27.9	-0.3	0.0	-0.3	1.1
Wheat	-3.4	9.9	-50.9	15.7	0.9	-13.8	-10.2	8.4	14.4	1.4	10.1	6.5	8.6	-0.1	10.6
Other grain	-1.0	15.0	-56.7	-47.3	-3.2	-9.0	-6.6	9.9	2.4	0.4	7.9	1.7	1.3	-0.5	0.4
Non-grain crops	-6.4	9.4	-15.5	-21.5	-4.0	-3.5	0.4	6.4	7.8	4.1	20.0	6.9	7.9	2.9	1.6
Wool	-8.4	-3.7	17.8	-10.5	61.5	-17.5	-13.9	19.2	-8.8	-10.9	-0.3	-0.4	-3.2	-7.2	0.3
Other livestock	-1.8	11.3	-6.6	-15.2	-0.1	-4.6	-2.1	4.5	1.0	2.3	2.9	2.2	-0.2	1.0	3.6
Forestry	1.1	1.0	-0.1	-6.6	-6.7	-22.2	-3.3	1.9	-5.1	-2.8	49.2	-0.5	-1.6	-1.5	0.6
Fishery	1.4	6.7	-1.2	-0.7	-7.0	-9.8	-4.1	-2.2	-3.9	-4.5	-5.1	1.8	-0.2	-2.3	2.6
Processed rice	0.1	6.0	0.1	-0.2	-2.2	-12.5	-1.9	4.9	-0.7	-1.3	-11.0	-1.2	-1.8	-1.3	0.2
Meat	-1.2	6.4	-1.6	-0.8	-1.9	-8.1	-1.6	8.7	0.9	-1.2	8.1	1.8	0.1	-1.6	2.1
Milk products	-2.2	16.7	-6.9	-3.6	12.9	-5.4	-2.3	25.4	-0.1	-2.5	15.8	2.0	3.8	-5.7	6.7
Other food products	0.0	-0.2	1.4	7.4	-2.8	-17.2	-7.0	2.4	-2.6	-4.4	2.5	0.7	-2.7	-2.6	-0.2
Beverages and tobacco	0.9	-0.5	-0.8	-4.0	-3.9	-9.6	-8.3	27.8	-2.5	-4.5	6.0	0.3	-0.5	-1.9	-0.1
Minerals	1.1	3.8	-1.7	-4.2	-17.0	-30.6	-14.9	-2.8	-15.3	-7.0	-7.0	-0.2	-2.0	-8.9	1.4
Textiles and clothing	-19.9	-9.4	-2.2	50.1	151.7	653.6	114.3	53.8	24.0	26.7	13.6	-2.3	-13.1	22.1	-9.6
Other manufactures	0.5	-4.8	0.8	0.2	-10.8	-24.4	-3.0	-0.4	-3.3	-7.3	10.7	-1.5	-4.7	-4.9	0.0
Services	0.4	0.1	0.3	0.3	-1.9	-7.6	-2.4	-0.9	-1.4	-0.8	-3.6	0.1	-1.7	-1.2	0.1
Wages	-0.8	0.5	2.2	4.0	8.2	19.4	9.9	1.6	5.3	4.9	11.7	-0.2	1.5	4.4	-0.4

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Table 19. Changes in land prices resulting from the Uruguay Round agricultural trade liberalization (E4)

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-8.9	15.9	-15.4	-19.4	3.9	7.0	7.3	13.1	10.7	7.8	41.3	4.3	6.1	5.4	2.7
Wheat	-7.2	16.6	-45.3	-6.8	5.4	2.2	1.2	13.1	20.2	8.6	28.4	8.8	11.9	5.5	8.8
Other grain	-5.7	20.0	-49.6	-43.7	2.7	5.8	3.7	14.1	12.0	7.9	26.7	5.6	7.0	5.2	2.2
Non-grain crops	-9.0	16.2	-22.5	-27.3	2.1	9.8	8.7	11.8	15.8	10.4	35.6	9.0	11.4	7.5	3.0
Wool	-10.3	7.1	-4.1	-20.9	42.5	-0.7	-1.5	20.2	4.0	-0.1	20.5	4.2	3.9	0.6	2.2
Other livestock	-6.2	17.5	-17.4	-23.6	4.8	9.0	7.0	10.4	11.0	9.2	22.9	6.0	5.9	6.2	4.3
Forestry	-4.4	10.4	-13.7	-18.8	0.3	-4.4	6.1	8.7	6.6	5.7	55.2	4.2	5.0	4.5	2.4
Fishery	-4.2	14.4	-14.4	-15.5	0.0	5.2	5.5	5.9	7.5	4.5	16.7	5.7	5.9	4.0	3.7
Processed rice	-3.9	10.2	-9.7	-10.5	4.6	7.2	7.8	8.2	8.6	6.3	11.9	2.6	4.0	4.6	1.5
Meat	-4.5	10.4	-10.4	-10.8	4.8	9.7	8.0	10.1	9.4	6.3	22.7	4.1	4.9	4.5	2.4
Milk products	-5.0	15.4	-12.8	-12.0	11.9	11.2	7.6	17.7	8.9	5.6	26.7	4.2	6.7	2.4	4.5
Other food products	-4.0	7.1	-9.1	-7.3	4.3	4.4	5.1	7.0	7.6	4.7	19.6	3.5	3.5	4.0	1.3
Beverages and tobacco	-3.6	7.0	-10.1	-12.2	3.7	8.9	4.4	18.8	7.7	4.6	21.5	3.4	4.6	4.3	1.3
Minerals	-3.5	9.1	-10.5	-12.2	-3.2	-3.9	0.8	4.4	0.8	3.3	14.2	3.1	3.9	0.7	2.0
Textiles and clothing	-12.8	2.2	-9.9	8.2	59.3	179.9	52.5	27.7	19.6	18.6	24.6	2.0	-1.6	14.9	-3.2
Other manufactures	-3.5	4.5	-8.7	-9.5	0.6	1.1	7.4	5.4	7.1	3.3	23.2	2.3	2.4	2.9	1.3
Services	-3.4	6.5	-8.4	-8.8	5.2	11.0	7.8	4.9	7.9	6.3	15.7	2.9	3.7	4.6	1.2

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

proceed is to reduce trade barriers on a non-discriminatory basis, the most favoured nation (MFN) principle. This is the rationale underlying the GATT-based global multilateral trade liberalization.

For historical and political reasons, a number of regional trade blocs have been formed, either as free trade areas or as custom unions. Trade theory shows that in terms of global welfare, regional trade arrangements are inferior to multilateral trade liberalization. Unlike MFN-based global trade arrangements, regional trade blocs lead to trade diversion as well as trade creation. In other words, intraregional trade may increase as a result of reductions in regional trade barriers, but this can occur at the expense of interregional trade. More competitive imports from outside the regional blocs are replaced by less competitive imports from within the regional blocs.

In the wake of the formation of the European Union and the North America Free Trade Area (NAFTA), there has been increasing interest in closer regional economic relations in the Asia-Pacific region. The gains from any such regional arrangements depend on the form of integration. Open regionalism of the type proposed under the Asia-Pacific Economic Cooperation (APEC) initiative provides greater opportunities for trade and investment without discriminating in favour of regional partners. Hence the benefits are greater than the exclusive type of regionalism, of which the EU is an example. The actual welfare gains or losses depend on the height of initial tariffs (i.e., the degree of discrimination created by the regional free trade arrangement).

The great diversity of the ESCAP region means that economic integration in the form of a free trade area is unlikely in the foreseeable future. The interests of countries may be best served by adopting an open regionalism approach to regional economic cooperation, if further trade liberalization in the region beyond what has been agreed in the Uruguay Round is pursued. This can take the form of concerted trade liberalization as well as reductions in barriers to investment flows. Trade liberalization should be taken in its broadest sense by reducing all tariff and non-tariff barriers, as well as harmonising customs procedures, commodity classifications, health standards, etc. This should lead to greater transparency in the trade and investment systems and greater economic cooperation. The ESCAP region can build on this liberalization process for further economic cooperation.

(a) MFN-based regional trade liberalization

In what follows, we explore the consequences of more aggressive trade liberalization than required by the Uruguay Round as a concerted effort by the ESCAP region. The experiment examines the potential impact of such liberalization on regional welfare, trade, production and employment. In contrast to the modest trade liberalization required of developing countries in the Uruguay Round, we implement a 50 per cent MFN trade liberalization in all commodities and all forms of trade barriers (at least those available in the model database) in the ESCAP region. This includes reductions in tariffs and non-tariff barriers, export subsidies and taxes, and production subsidies and taxes. The depth of liberalization is about twice the magnitude agreed under the Uruguay Round for developing countries.

We use the same model closure and the implementation of the reforms as in the previous experiments. Two simulations have been conducted. One involves all the reform measures outlined above, and the other incorporates induced technological progress in addition to the trade liberalization.

If any MFN-based regional trade liberalization eventuates in the ESCAP region, the economic benefits will not only come from static effects alone (i.e., the net effects of trade creation and trade diversion), but also from productivity improvements, as in the case of multilateral trade liberalization examined above. Research shows that the formation of the European Union in 1992 under the Single European Act can generate considerable productivity improvement in its member countries (Cecchini and others, 1988; Baldwin, 1989). In light of this evidence, in the second simulation we postulate a 1.5 per cent improvement in productivity in all countries in the ESCAP region and a one per cent increase in countries outside the ESCAP region following the regional trade liberalization on top of the Uruguay Round reform. The productivity improvement, which implies obtaining one per cent more output from a given level of inputs, takes place over the period of liberalization. Again, the accuracy of the results is not the objective of this exercise; it is the sources of the potential economic benefits from further trade liberalization in the region that we are trying to demonstrate.

The welfare impact of additional trade liberalization in the ESCAP region is substantial. (To see this, table 20 results below should be compared with results in table 14, experiment E4). Assuming there is no endogenous technological progress as the result of trade liberalization, countries of the ESCAP region as a group gain $54 billion. This is $12 billion larger than the gain from the Uruguay Round reform alone. As expected, it is the

countries that gain by far the most from their own reforms. This occurs despite deterioration in the terms of trade for many countries.

Table 20. Welfare effects (equivalent variation) of 50 per cent regional liberalization
(Millions of US dollars at 1992 prices)

	Without induced technological change		With induced technological change	
	Equivalent variation	Terms-of-trade	Equivalent variation	Terms-of-trade
Industrial countries	455,568	0.53	277,824	0.62
Australasia	1,027	0.26	10,645	0.32
Japan	38,238	1.99	139,985	1.63
Korea, Republic of	4,240	-1.88	14,865	-1.78
Indonesia	2,116	-2.77	5,747	-2.97
Malaysia	3,443	-2.83	5,191	-2.97
Philippines	476	-3.01	2,027	-2.83
Singapore	-165	-0.17	2,077	0.02
Thailand	-726	-4.38	2,465	-4.40
China	4,041	-4.01	19,728	-4.09
Hong Kong	1,122	1.33	4,426	3.04
Latin America	-441	-0.90	22,862	-0.85
Sub-Saharan Africa	420	-0.03	3,683	0.07
South Asia	244	-3.52	10,556	-3.73
Rest of the world	-6,799	-0.83	47,652	-0.79
Subtotal: ESCAP region	54,055		217,713	
World	92,803		569,734	

Source: Simulation results.

Singapore and Thailand are the only two losers from the proposed liberalization. These two regions also lost in the Uruguay Round trade reform experiment presented above. Compared with that experiment, however, both countries are actually better off from their participation in the regional trade liberalization.

Although we have assumed a moderate 1-1.5 per cent improvement in productivity as a result of the Uruguay Round and the ESCAP region's further trade liberalization, the impact of this induced technological change is dramatic. The ESCAP region as a whole gains $218 billion. Moreover, no country loses. As in the experiment without the incorporation of induced technological change, the gain from the ESCAP region's liberalization initiative accrues exclusively to the region itself (to see this one has to compare this experiment with E5 in the previous section). This again

highlights the point that the largest gain from trade liberalization is likely to come from induced technological change, both for the global and individual economies.

Most countries of the ESCAP region are projected to increase their net exports (table 21). This largely results from the abolition of the MFA, but net exports of some agricultural products, such as milk products, also increase. The considerable increases in imports of agricultural products also mean that consumers in the ESCAP region can enjoy foreign products without increasing trade deficits. Nevertheless, this does not exclude the possibility that some particular sectors in some countries may face substantial adjustment. Policies should, therefore, be targeted to these sectors to help the adjustment process.

Changes in production and employment indicate the magnitudes of the adjustment required for the sectors adversely affected by trade liberalization (tables 22 and 23). The adjustments are particularly large in countries which have given high protection to agriculture, notably in Japan and the Republic of Korea. Several other countries also face substantial adjustment in certain sectors. Most countries suffer a substantial decline in wool production and employment. Given that this sector is typically a minor industry, the impact is expected to be small. It should be noted that substantial increases in employment in manufacturing industries, especially in textiles and clothing, will make the transition much easier.

Owing to the model closure we used in the experiment, total employment does not change following trade liberalization. This leads to an underestimate of the positive impact of trade liberalization on employment. An alternative labour market closure is to assume that wages (either in real or nominal terms) are fixed, so that any expansion of production as a result of trade liberalization will translate into increases in total employment.

With fixed total employment, the benefits to labour are largely reflected in increases in wages (table 23). Clearly, wages in all countries in the ESCAP region increase. The benefits that could accrue to labour as increased employment are also partly passed to landholders. Because of the wage increases, land is substituted for labour, and this drives up land prices. Changes in employment and land prices have important implications for different groups in the farm sector in the ESCAP region. Whether and to what extent trade liberalization will benefit farm employees, land tenants and landholders deserves more detailed study.

In summary, economic cooperation in the ESCAP region is well served by the GATT multilateral trade framework. An open regionalism

based on the APEC initiative will largely benefit the ESCAP region itself. The benefits of this approach are also well distributed among countries. Some sectors in individual countries will face considerable and even substantial adjustment, but countries in the region should be able to manage this transition with little trouble given the substantial gains flowing from further trade liberalization.

Table 21. Changes in net exports following the 50 per cent regional liberalization with induced technological improvement

(Millions of US dollars at 1992 prices)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	ESCAP	WLD
Rice	-41	1	0	0	0	0	0	0	-9	-1	0	-14	26	-8	42	-17	-4
Wheat	-221	148	-443	-45	-10	3	19	-3	5	-84	0	180	92	-92	427	-501	-24
Other grain	696	95	-799	-324	-7	6	0	-3	22	19	-1	96	48	2	5	-989	-145
Non-grain crops	-3,621	552	-3,596	-1,004	-979	129	52	-10	221	-578	-59	5,076	1,218	-797	1,065	-6,071	-2,333
Wool	264	-176	8	-76	-2	-3	0	0	-1	-63	-6	2	1	-16	74	-336	7
Other livestock	231	98	-270	-509	-3	-25	-18	1	-17	-605	-162	49	153	-99	882	-1,608	-292
Forestry	606	55	-203	-87	-9	-277	-21	-1	-65	-213	-8	5	-37	-24	146	-852	-132
Fishery	1,311	369	-1,139	-391	-166	-160	-136	-8	-252	-802	-243	282	221	-303	1,219	-3,232	-199
Processed rice	61	18	-20	-19	-6	-10	-1	-6	-69	-49	-36	-69	279	-85	10	-282	-1
Meat	-2,059	628	-937	-136	1	-5	-7	-2	54	-131	-94	978	150	-16	1,387	-645	-190
Milk products	-1,992	1,040	-467	-47	-1	3	-8	36	-3	-12	-42	243	33	-45	1,210	454	-53
Other food products	884	-71	-280	961	-72	-61	-547	37	-317	-1,407	-312	946	216	-434	109	-2,503	-348
Beverages and tobacco	-2,448	-259	2,619	1,114	-46	-183	-190	-67	670	-554	-1,053	-475	494	-27	-2	2,022	-409
Minerals	7,127	1,268	-2,324	-500	-2,233	-1,121	-146	43	-547	-1,957	-169	237	-1,188	-1,628	2,816	-9,315	-323
Textiles and clothing	–	-733	-4,290	11,361	19,077	27,126	3,320	187	4,511	34,156	-3,548	-1,317	-859	14,639	–	105,806	-7,208
Other manufactures	1,933	-4,357	24,371	-1,836	-5,019	-6,544	469	92	-192	-279	-8,157	-6,912	-988	-1,478	-3,024	-2,930	-11,920
Services	38,009	1,150	-8,062	-2,303	-347	-1,575	-804	-567	-160	-1,074	-6,125	1,310	-260	-1,742	6,125	-21,610	23,574
Total	-59,519	-173	4,167	6,159	10,178	17,304	1,981	-273	3,850	26,367	-20,016	616	-401	7,847	1,914	57,391	0

Source: Simulation results.

Acronyms: IND: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world; ESCAP: ESCAP countries; WLD: World

Table 22. Changes in production following the 50 per cent regional liberalization with induced technological improvement

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-5.0	6.7	1.1	0.3	1.4	-2.6	-1.6	5.1	-3.2	-0.7	20.1	-0.9	4.7	-0.5	0.6
Wheat	-1.8	7.1	-48.1	16.3	4.6	-14.7	-11.2	8.6	10.5	-2.8	21.1	5.0	12.1	-1.4	9.8
Other grain	-0.3	12.4	-53.7	-36.2	0.5	12.8	-6.3	15.4	4.6	-1.8	8.8	1.3	4.3	-0.5	0.8
Non-grain crops	-4.9	7.2	-10.0	-12.7	-1.4	6.0	0.3	2.6	4.5	1.7	14.2	7.2	8.8	0.9	2.1
Wool	-5.3	-4.8	12.5	-3.4	69.1	-21.6	-12.1	18.3	-14.2	-19.4	6.9	-0.4	30.0	-17.9	2.6
Other livestock	-1.3	8.3	-2.0	-6.1	3.0	-0.3	-0.9	6.0	0.7	1.3	2.9	1.5	4.4	2.0	3.6
Forestry	1.0	1.5	-1.9	-8.8	-7.4	-16.1	-0.5	-2.7	-4.1	-2.4	64.9	-0.3	-1.9	-0.7	0.7
Fishery	3.0	18.8	-0.4	-2.7	-2.9	-5.9	-1.8	3.8	-9.7	-8.0	-7.3	3.6	8.9	-2.6	5.3
Processed rice	0.8	9.8	1.7	2.3	3.0	-2.1	0.1	6.7	-1.6	-0.5	-23.4	0.1	7.6	-0.2	1.3
Meat	-0.5	6.4	1.2	2.0	2.3	1.1	1.2	12.3	2.0	-0.8	10.3	2.5	7.5	0.7	3.5
Milk products	-1.7	20.9	-4.7	0.4	23.0	3.2	0.7	32.6	3.7	-1.2	24.6	3.1	14.1	-8.8	8.1
Other food products	0.0	0.2	3.5	11.9	1.6	-2.1	-6.2	7.5	-3.8	-5.1	-0.1	1.8	6.2	-0.6	1.4
Beverages and tobacco	1.7	-1.1	17.7	30.4	2.8	-10.1	-5.2	-7.3	21.0	0.9	-41.8	1.0	11.2	4.4	3.0
Minerals	1.1	4.1	-2.7	-7.1	-16.6	-20.1	-5.8	3.9	-15.3	-8.7	-7.3	-1.0	-4.8	-10.8	0.9
Textiles and clothing	-18.8	-8.0	-0.6	52.6	194.9	678.3	108.3	73.1	27.6	30.9	10.1	-1.0	-8.9	27.3	-8.0
Other manufactures	0.7	-4.5	2.2	0.6	-10.4	-18.1	5.3	0.2	-0.2	-0.3	12.6	-1.2	-2.5	0.1	0.1
Services	1.6	1.9	1.7	1.5	2.9	0.6	-0.1	1.3	1.2	1.9	-0.5	1.4	-0.1	1.7	1.3

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Table 23. Changes in employment and wages following the 50 per cent regional liberalization with induced technological improvement

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-6.7	7.0	-3.5	-8.2	-2.2	-7.3	-4.8	5.9	-5.7	-2.7	23.2	-1.0	4.2	-2.1	0.1
Wheat	-3.4	7.5	-53.8	9.9	1.8	-19.4	-15.5	9.4	9.3	-5.0	23.4	5.4	11.6	-2.9	10.5
Other grain	-1.8	13.6	-59.2	-46.6	-3.4	9.8	-10.1	17.0	3.0	-3.9	9.2	1.0	3.7	-2.1	0.2
Non-grain crops	-6.6	7.7	-15.2	-22.3	-5.3	2.1	-2.7	3.0	2.8	-0.1	16.2	7.7	8.3	-0.6	1.7
Wool	-6.8	-5.7	8.7	-12.3	72.9	-25.7	-16.5	19.5	-16.7	-22.9	7.4	-0.6	31.2	-19.6	2.2
Other livestock	-2.7	9.0	-6.8	-15.2	-0.4	-4.7	-4.0	6.8	-1.4	-0.5	3.0	1.3	3.7	0.5	3.4
Forestry	0.0	0.0	-3.3	-9.9	-10.4	-20.4	-2.1	-4.2	-6.0	-3.8	62.1	-1.3	-3.6	-2.0	-0.3
Fishery	2.0	17.1	-1.8	-4.0	-6.1	-10.9	-3.4	2.0	-11.3	-9.3	-9.0	2.6	7.1	-4.0	4.3
Processed rice	-0.2	8.3	0.2	1.2	-1.6	-10.5	-1.6	4.8	-3.7	-1.5	-24.9	-0.9	3.9	-1.1	0.3
Meat	-1.4	4.9	-0.2	0.8	-1.9	-7.6	-0.6	10.4	-0.4	-1.8	8.2	1.5	3.5	-0.1	2.5
Milk products	-2.6	19.2	-6.1	-0.8	17.5	-5.7	-1.1	30.3	1.4	-2.3	22.2	2.2	9.7	-9.5	7.1
Other food products	-1.0	-1.2	2.1	10.6	-2.9	-10.5	-7.8	5.6	-5.9	-6.1	-2.0	0.9	2.5	-1.4	0.4
Beverages and tobacco	0.7	-2.5	16	29	-2.4	-17.2	-6.9	-9.0	18.3	0.0	-43.1	0.0	6.7	3.8	2.0
Minerals	0.2	2.7	-4.1	-8.2	-21.0	-27.7	-7.5	1.8	-17.3	-9.7	-9.4	-2.0	-8.9	-11.5	-0.1
Textiles and clothing	-19.6	-9.3	-2.0	50.9	181.5	627.2	104.9	70.3	24.8	29.5	8.1	-2.0	-12.0	26.2	-8.9
Other manufactures	-0.3	-5.9	0.8	-0.4	-15.2	-24.9	3.5	-1.7	-2.5	-1.4	10.4	-2.1	-6.2	-0.6	-0.9
Services	0.7	0.5	0.2	0.4	-1.8	-7.3	-1.8	-0.5	-1.2	0.7	-2.6	0.4	-3.3	0.7	0.3
Wages	0.7	5.7	9.6	13.3	12.5	27.4	18.7	11.7	13.7	22.2	31.8	1.6	6.4	20.1	1.5

Source: Simulation results.

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Table 24. Changes in land prices following the 50 per cent regional liberalization with induced technological improvement

(percentage change)

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW
Rice	-8.3	17.9	-9.9	-13.1	6.2	18.1	9.7	23.7	8.7	17.8	61.4	5.6	16.8	17.0	3.7
Wheat	-6.3	18.3	-43.8	-2.5	8.9	8.0	1.6	26.3	19.4	16.0	61.6	9.9	22.1	16.3	10.5
Other grain	-5.3	22.5	-48.1	-38.6	5.4	31.7	5.7	31.8	14.9	16.9	49.4	7.0	16.4	16.9	3.7
Non-grain crops	-8.3	18.4	-17.1	-21.9	4.0	25.7	11.2	21.5	14.8	19.9	55.5	11.5	19.8	18.1	4.7
Wool	-8.5	8.7	-2.8	-15 6	53.0	2.5	0.8	33.6	0.3	1.5	47.8	5.9	35.4	3.1	5.1
Other livestock	-5.9	19.3	-11.9	-17.5	7.4	20.2	10.3	24.3	11.8	19.5	43.9	7.2	16.5	18.9	5.9
Forestry	-4.2	12.9	-9.8	-14.2	0.4	7.1	11.7	16.0	8.4	17.0	92.5	5.5	11.2	17.0	3.4
Fishery	-3.0	24.9	-8.9	-10.6	3.5	15.2	10.7	20.7	4.4	12.6	32.9	8.1	18.9	15.5	6.4
Processed rice	-3.0	15.2	-3.4	-2.4	8.1	18.5	13.7	19.8	11.1	19.6	21.1	4.6	13.8	18.3	3.2
Meat	-3.6	13.5	-3.6	-2.6	8.0	20.3	14.3	22.8	12.8	19.5	43.9	5.8	13.6	18.9	4.3
Milk products	-4.1	20.6	-6.3	-3.3	17.6	21.5	14.0	32.8	13.8	19.2	52.4	6.1	16.8	13.5	6.4
Other food products	-3.4	10.3	-2.6	1.8	7.5	18.5	10.3	20.2	9.8	17.0	37.3	5.5	13.1	18.2	3.2
Beverages and tobacco	-2.6	9.6	3.5	9.4	7.7	14.3	10.8	12.1	22.4	20.5	6.2	5.1	15.3	21.0	4.0
Minerals	-2.9	12.4	-5.4	-6.8	-2.5	7.2	10.5	18.2	3.4	14.9	32.4	4.1	7.0	12.3	3.0
Textiles and clothing	-11.7	5.9	-3.6	17.5	72.6	200.9	57.8	47.9	24.7	35.2	43.0	3.9	5.3	31.9	-1.2
Other manufactures	-2.8	7.7	-2.4	-2.2	1.5	10.1	16.6	16.0	11.8	19.9	44.4	3.9	8.3	18.7	2.5
Services	-2.3	10.6	-2.0	-1.1	8.5	21.3	14.2	16.3	12.5	21.0	36.4	4.8	9.6	19.4	3.0

Source: Simulation results.

Acronyms: IND: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world.

Annex: The impact of the Uruguay Round on bilateral trade flows

Table A1. Changes in bilateral trade flows as a result of the Uruguay Round trade liberalization
(Millions of US dollars)

Paddy rice

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	42.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	-4.0	0.0	-33.2	23.8
AUS	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.1
JPN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
KOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MYS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	2.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	2.6
CHN	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.5
HKG	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
LTN	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	-0.1	0.0	0.0	11.4
SSA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3
SAS	15.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	15.1
ROW	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	13.8	21.6
WLD	79.4	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	20.6	-4.0	0.0	-19.0	77.6

Table A1. (*continued*)

Wheat	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	45.9	0.2	306.0	-40.8	-25.2	-6.9	-17.1	-1.2	-3.6	-194.5	0.7	-140.8	-153.4	-28.7	-401.0	-660.5
AUS	0.0	0.8	70.3	22.4	-0.1	-4.4	0.0	0.0	-0.6	10.1	0.0	0.0	13.0	-1.0	32.7	143.2
JPN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	1.4
KOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MYS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
PHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
CHN	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
HKG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTN	0.6	0.0	0.4	0.0	5.8	0.0	0.0	0.1	0.0	9.1	0.0	80.4	3.9	5.0	22.7	127.8
SSA	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.1	1.3
SAS	0.0	0.0	0.0	0.6	0.3	-0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.9	0.1	14.9	17.1
ROW	7.5	0.0	0.3	25.5	14.8	2.3	2.1	2.1	2.6	7.7	0.0	6.5	17.7	1.2	116.3	206.5
WLD	54.3	1.0	377.0	8.1	-4.0	-9.2	-14.7	1.1	-1.6	-167.6	0.8	-52.5	-117.1	-23.5	-214.3	-162.1

Table A1. (*continued*)

Other grains

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	125.0	-0.3	515.7	72.6	0.2	-0.2	-2.8	-1.5	-0.2	-21.1	-0.6	74.2	-82.9	0.1	-106.8	571.4
AUS	1.8	0.4	14.6	3.6	0.0	-0.2	0.9	0.0	0.0	12.7	0.0	0.0	0.3	0.0	50.2	84.3
JPN	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
KOR	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
IDN	0.0	0.0	0.0	0.0	0.0	-2.8	0.1	-0.4	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	-3.0
MYS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHL	0.0	0.0	0.0	0.0	0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	0.7	0.0	0.4	0.0	3.1	-4.3	0.0	1.0	0.0	0.0	0.8	0.0	0.9	0.0	12.5	15.2
CHN	2.5	0.0	73.0	182.1	4.7	-6.4	1.4	1.8	5.2	0.0	1.2	-0.1	0.5	-0.4	-10.6	255.0
HKG	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
LTN	44.9	0.0	38.1	0.0	0.0	0.1	0.0	0.2	0.3	0.2	0.0	21.1	15.8	0.9	83.0	204.7
SSA	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	7.6	0.0	0.3	13.2
SAS	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	0.1
ROW	13.1	0.0	18.2	0.6	0.2	-0.1	0.0	0.1	0.0	1.1	0.0	0.6	1.0	0.0	-0.2	34.5
WLD	193.5	0.1	660.4	259.0	8.6	-14.1	-0.3	1.4	5.3	-7.1	1.4	96.0	-56.6	0.6	28.1	1,176.3

Table A1. (*continued*)

Non-grain crops

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	643.9	-4.3	1,019.6	360.3	280.8	-1.6	50.7	-2.6	63.7	175.2	4.4	-119.3	-24.2	2.6	-448.3	2,001.3
AUS	87.8	2.3	165.2	53.4	154.6	1.1	0.9	4.8	16.3	-0.5	2.3	0.0	1.7	13.0	41.8	544.7
JPN	-24.2	-1.9	0.0	2.3	1.0	-0.7	-0.4	-1.7	-0.4	-1.7	-7.2	-2.0	-0.3	-0.7	1.8	-36.0
KOR	3.0	0.2	148.4	0.0	1.7	0.2	0.0	0.4	0.7	1.3	4.5	0.1	0.1	0.6	21.9	183.2
IDN	-14.1	3.2	71.3	25.3	0.0	4.8	-0.4	10.9	1.0	15.1	0.4	-2.1	0.6	7.3	25.5	148.7
MYS	-10.2	-0.9	21.5	38.5	2.9	0.0	1.2	-40.1	0.7	-10.6	-2.8	-10.0	-1.4	0.5	-1.6	-12.5
PHL	-5.6	0.0	98.2	34.9	0.8	-0.5	0.0	-0.4	0.3	1.3	-0.8	-0.1	0.0	0.3	2.5	130.9
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	291.5	1.0	238.3	71.8	12.2	1.4	0.0	8.2	0.0	-8.5	3.5	1.6	1.0	6.2	44.4	672.5
CHN	121.0	2.3	272.1	76.8	146.4	1.3	6.5	5.0	17.9	0.0	8.9	-1.0	2.9	5.5	47.6	713.2
HKG	-0.1	0.1	1.3	2.7	14.2	0.3	0.1	0.1	0.3	13.8	0.0	-0.2	0.0	0.5	0.8	34.0
LTN	2,647.4	8.9	398.3	105.5	103.5	9.7	1.1	3.9	52.5	28.4	11.2	129.2	7.0	4.2	373.0	3,883.9
SSA	967.7	0.9	76.3	18.3	26.1	3.8	0.0	5.6	67.8	31.4	0.6	1.3	8.0	26.4	69.6	1,303.8
SAS	76.9	2.8	67.1	37.9	75.4	1.1	-0.8	0.8	38.8	8.8	0.2	-1.8	2.6	26.7	77.1	413.9
ROW	1,001.1	0.7	122.9	20.7	26.9	1.2	0.1	-1.0	7.5	14.6	-1.7	-4.2	-0.2	22.0	19.6	1,230.2
WLD	5,785.9	15.3	2,700.6	848.5	846.7	22.0	59.2	-6.1	267.2	268.7	23.5	-8.4	-1.9	115.2	275.7	11,211.8

Table A1. (*continued*)

Wool																
	IND	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	-0.3	0.2	3.6	0.9	0.1	0.0	0.0	0.1	0.1	2.5	0.3	0.2	0.1	1.6	2.7	12.1
AUS	-212.0	-1.7	-14.9	57.7	1.2	0.2	0.1	0.1	0.8	23.8	5.1	-1.3	-0.5	1.7	-43.8	-183.8
JPN	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	1.3
KOR	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
IDN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MYS	0.0	0.0	-0.8	0.1	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.2	0.0	0.0	0.0	-0.3	-1.5
PHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHN	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-0.8	-0.2	-1.1
HKG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	-0.4	-0.1
LTN	-9.7	0.0	0.3	0.5	0.1	0.0	0.0	0.0	0.0	2.2	0.1	1.6	0.0	1.7	0.9	-2.4
SSA	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
SAS	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.1	-1.3
ROW	-8.0	0.0	1.1	10.7	0.0	0.0	0.0	0.0	0.0	3.3	1.9	0.0	0.2	0.3	0.4	10.0
WLD	-231.3	-1.5	-10.7	70.7	1.4	0.2	0.5	0.2	1.0	32.0	7.5	0.5	-0.2	4.2	-40.8	-166.4

Table A1. (*continued*)

Other livestock products

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	288.7	6.1	185.5	324.1	8.0	2.1	4.7	1.9	8.3	88.0	40.6	28.9	1.7	8.1	81.1	1,077.8
AUS	66.1	1.1	10.5	25.4	4.1	1.4	6.4	0.5	8.8	-0.8	-0.4	-0.2	-0.1	2.3	-15.3	109.6
JPN	12.2	0.6	0.0	9.4	0.3	0.2	1.8	0.2	8.1	3.1	5.8	0.3	0.0	0.3	14.3	56.8
KOR	2.9	0.0	5.3	0.0	0.7	0.0	0.9	0.0	-0.1	1.7	0.6	0.0	0.0	0.1	-0.1	12.0
IDN	0.8	0.0	0.3	0.4	0.0	0.4	0.4	0.3	0.0	0.6	-1.1	0.0	0.0	0.0	-0.2	1.9
MYS	0.1	-0.1	-0.2	0.0	0.0	0.0	0.0	-21	0.8	0.3	-0.6	0.0	0.0	0.0	-0.6	-21.5
PHL	-0.2	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	-0.1	0.1
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THA	-0.1	0.2	3.4	0.2	0.1	0.4	0.1	0.3	0.0	0.9	0.6	0.0	0.0	0.0	-0.5	5.6
CHN	133.8	0.0	12.0	22.3	0.2	0.1	0.0	0.1	-15.5	0.0	-21.1	-0.3	0.0	7.5	-9.4	129.5
HKG	3.3	0.0	0.0	1.0	0.0	0.1	0.0	-0.1	0.8	9.2	0.0	-0.1	-0.1	1.0	-0.6	14.7
LTN	53.4	0.3	11.9	10.0	0.1	0.2	0.0	0.3	3.8	0.2	1.4	16.6	0.0	0.8	0.8	100.1
SSA	29.8	0.0	2.4	0.2	0.2	0.0	0.0	0.2	0.1	0.8	0.1	0.2	0.3	0.7	0.8	35.8
SAS	13.4	0.0	1.3	0.5	0.0	0.0	0.0	0.0	0.1	1.1	-0.1	0.0	-0.2	-0.4	-2.1	13.6
ROW	680.5	0.6	43.9	27.5	1.0	0.4	0.4	4.5	3.4	22.3	6.2	0.8	0.1	10.6	6.2	808.4
WLD	1,284.6	8.8	276.2	421.2	14.8	5.2	14.7	-12.6	18.5	127.9	31.9	46.1	1.7	31.0	74.2	2,344.3

Table A1. (*continued*)

Forestry products																
	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	7.0	0.0	259.4	53.5	6.2	0.3	4.3	0.5	0.1	22.0	1.5	2.4	0.4	4.3	58.4	420.4
AUS	0.0	0.0	19.2	20.0	0.0	0.0	2.9	0.0	0.0	4.2	0.2	0.0	0.0	0.3	-0.1	46.8
JPN	-0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-0.2	-0.5
KOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDN	-1.1	0.0	-0.4	-0.1	0.0	-0.1	0.0	-0.3	0.0	2.0	0.0	0.0	0.0	0.0	-1.4	-1.2
MYS	-2.4	-0.1	-276.4	-57.5	-0.1	0.0	0.1	-1.1	10.9	14.8	-3.2	0.0	-1.0	-14.5	-56.0	-386.4
PHL	-0.2	0.0	-1.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-1.7
SGP	-0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.7	0.0	0.0	0.4	-0.8	0.5
THA	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
CHN	-0.1	0.0	-2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	-0.4	-2.4
HKG	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	-0.1	3.6	0.0	0.0	0.0	0.0	0.0	4.3
LTN	-0.1	0.0	3.2	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	13.3
SSA	-17.5	0.0	2.4	0.7	0.0	0.0	0.0	0.1	0.0	0.7	0.2	-0.1	0.0	1.8	-4.0	-15.7
SAS	-0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.4
ROW	0.8	0.0	50.6	4.0	0.0	0.0	0.5	0.9	19.7	11.3	6.1	0.2	0.2	5.0	-0.9	98.3
WLD	-15.0	-0.2	54.7	28.7	6.2	0.6	8.7	0.1	30.7	58.8	6.1	2.5	-0.4	-2.5	-3.8	175.3

Table A1. (*continued*)

Fishery products	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	14.9	0.6	492.7	53.4	3.1	1.4	2.0	1.6	45.7	44.9	8.5	3.9	17.6	0.2	63.9	754.5
AUS	4.4	2.6	69.4	12.8	0.4	5.5	0.2	2.9	3.8	5.1	16.1	0.0	0.0	0.0	8.3	131.5
JPN	-16.7	-1.0	0.0	7.0	0.7	14.0	5.9	0.5	10.4	2.8	6.8	-0.8	-0.3	0.0	-4.6	24.6
KOR	-11.6	0.0	19.3	0.0	2.9	0.2	0.6	0.1	5.8	0.2	0.2	-0.6	-0.1	0.0	-17.3	-0.4
IDN	-52.7	-1.7	-100.3	0.7	0.0	-0.7	0.6	-13.9	-8.9	0.1	-3.7	-0.1	-0.2	0.0	-2.6	-183.3
MYS	-18.2	-4.2	-22.6	-1.3	0.0	0.0	-0.2	-20.0	-3.2	0.0	-5.1	0.0	-0.1	0.0	-1.3	-76.3
PHL	-37.8	-0.5	-34.4	-0.3	0.0	0.2	0.0	-0.3	-0.6	0.6	-3.2	-0.1	0.0	0.0	-2.0	-78.6
SGP	-17.9	-0.3	2.7	0.4	0.3	2.6	0.3	0.0	1.6	4.4	0.7	0.0	-0.2	0.0	-4.2	-9.5
THA	-14.4	-0.5	48.2	2.9	0.0	8.3	0.6	2.1	0.0	23.3	4.4	-0.3	-0.1	0.0	-1.9	72.7
CHN	-114.3	-0.2	-73.7	3.8	0.0	0.7	0.9	-0.6	-0.7	0.0	-13.5	0.0	0.0	0.0	-7.3	-204.9
HKG	-5.1	-0.3	-4.6	0.2	0.0	0.5	0.0	-0.3	0.1	0.5	0.0	0.0	0.0	0.0	-0.5	-9.5
LTN	54.8	1.5	98.2	17.1	0.0	0.1	0.0	1.0	5.0	14.5	2.9	15.0	0.1	0.4	3.9	214.3
SSA	25.3	0.0	25.2	0.4	0.0	0.0	0.0	0.4	9.2	0.3	0.5	0.0	-4.0	0.0	-1.4	55.9
SAS	-60.5	-0.4	-21.7	0.2	0.7	0.3	0.0	-3.3	-0.1	2.8	-2.8	-0.2	-0.9	-0.2	-7.8	-93.8
ROW	328.8	0.7	305.0	53.3	0.3	2.6	9.9	21.4	58.0	21.2	17.5	6.9	1.4	0.0	21.0	848.0
WLD	79.2	-3.6	803.4	150.4	8.4	35.6	20.9	-8.5	126.2	120.6	29.3	23.6	13.3	0.4	46.3	1,445.3

Table A1. (*continued*)

Processed rice

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	67.7	0.6	2.0	0.8	0.8	0.1	0.0	0.4	0.0	0.0	0.4	42.8	18.7	2.1	64.7	201.1
AUS	7.1	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.5	0.5	0.2	0.0	1.0	12.9
JPN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.2	0.0	0.0	-0.1
KOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
IDN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	-0.8	0.0	-1.4
MYS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHL	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3
SGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
THA	4.9	-0.4	8.4	14.0	3.0	1.7	0.0	-0.3	0.0	-2.2	0.8	1.7	-8.9	0.7	-16.6	6.7
CHN	0.5	0.0	1.5	0.0	2.3	0.0	1.0	0.0	0.0	0.0	1.6	2.4	0.4	0.7	0.1	10.5
HKG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTN	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	-0.4	9.2
SSA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.1	1.0
SAS	16.8	-0.1	3.8	0.2	0.5	0.0	0.0	-0.1	0.0	-0.1	0.0	0.3	-2.9	2.5	-23.3	-2.3
ROW	4.2	0.0	0.0	0.0	0.9	0.0	0.1	0.9	0.0	1.6	0.0	3.1	0.6	0.0	0.7	12.1
WLD	107.5	0.2	16.0	15.0	7.1	1.9	1.1	1.2	0.0	-0.8	6.3	55.2	7.3	5.2	26.1	249.3

Table A1. (*continued*)

Meat products																
	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	-105.8	-1.5	106.2	66.4	0.5	-0.5	2.2	-14.8	1.4	10.6	-21.6	-137.7	-74.5	-0.2	-705.8	-875.1
AUS	205.4	4.6	226.5	63.5	4.9	3.8	1.6	4.8	0.8	2.6	4.2	5.0	4.6	0.3	115.7	648.2
JPN	1.6	0.1	0.0	1.4	0.1	0.1	0.1	0.2	0.5	2.9	6.8	0.1	0.0	0.0	1.3	15.2
KOR	0.1	0.0	19.2	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	19.8
IDN	7.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	7.6
MYS	0.1	0.0	0.0	0.0	0.0	0.0	0.4	-0.5	0.0	0.1	-0.1	0.0	0.0	0.0	-0.7	-0.8
PHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	-0.1	0.0	0.0	0.0	0.0	0.3
SGP	0.4	0.1	0.2	0.0	0.3	1.4	0.6	0.0	0.9	0.0	0.6	0.0	0.1	0.0	2.1	6.4
THA	25.0	0.0	70.1	0.6	0.0	0.0	0.0	1.4	0.0	1.6	1.1	0.0	0.0	0.0	0.2	100.2
CHN	15.6	0.0	21.5	1.0	0.2	0.4	0.1	2.5	1.9	0.0	3.8	0.4	0.5	0.1	68.2	116.4
HKG	0.2	0.0	0.6	0.0	0.0	0.2	0.1	0.1	0.0	1.9	0.0	0.0	0.0	0.0	0.3	3.4
LTN	644.9	0.0	55.9	0.4	0.0	1.0	0.0	5.4	0.0	2.6	17.4	77.7	7.2	0.4	119.7	932.7
SSA	20.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7	0.0	0.2	21.6
SAS	-0.2	0.0	0.0	0.0	0.0	1.8	0.0	0.1	0.0	0.0	0.0	0.0	0.4	-0.1	0.3	2.2
ROW	495.6	0.4	300.6	10.1	0.2	0.0	0.3	0.5	0.2	0.7	1.0	5.6	5.2	0.0	62.0	882.3
WLD	1,310.3	3.6	800.9	143.5	6.3	8.2	5.4	-0.2	5.7	23.8	13.4	-49.0	-55.9	0.5	-336.2	1,880.3

Table A1. (*continued*)

Milk products

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	-92.5	-8.7	43.0	6.8	-13.2	-12.2	-21.0	-15.6	-23.1	-4.9	-28.0	-365.8	-65.0	-17.8	-760.7	-1,378.8
AUS	192.1	27.7	244.0	12.0	8.9	14.4	16.1	11.4	15.5	4.9	6.1	84.6	23.4	19.4	194.3	874.8
JPN	1.1	0.0	0.0	0.2	0.1	0.0	0.1	0.6	1.9	0.8	0.5	0.0	0.8	0.2	0.7	7.0
KOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDN	0.0	0.0	0.0	0.1	0.0	0.0	0.9	0.6	0.0	0.1	0.7	0.0	0.1	0.8	0.1	3.5
MYS	0.0	-0.2	0.1	0.0	0.4	0.0	0.0	4.6	0.0	0.4	2.4	0.0	0.0	0.0	5.0	12.6
PHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
SGP	0.5	0.1	6.8	0.3	0.3	0.9	1.2	0.0	0.2	0.2	5.7	0.1	0.8	2.2	23.8	43.1
THA	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.9	0.0	2.1	1.5	0.0	0.0	0.1	1.4	9.0
CHN	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	6.4	0.0	0.0	0.0	0.5	7.2
HKG	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.3	2.3
LTN	11.4	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.7	1.2	0.0	3.4	88.5
SSA	1.1	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.2	2.8
SAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	-0.2	-0.6
ROW	479.1	7.0	107.5	18.3	6.1	2.3	5.2	3.2	10.2	4.9	2.6	39.3	8.7	8.7	96.1	799.3
WLD	593.1	26.0	403.6	37.7	2.7	5.4	4.7	6.9	4.7	10.4	-2.0	-171.1	-29.1	13.2	-435.2	470.7

Table A1. (*continued*)

Other food products

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	424.4	48.9	82.8	11.6	26.6	38.7	129.0	34.3	93.1	102.1	28.7	178.1	144.6	64.4	838.7	2,245.8
AUS	-3.1	35.8	-51.8	-10.3	8.5	-14.6	11.9	8.2	-1.1	18.8	1.1	1.1	0.9	8.8	6.6	20.7
JPN	60.2	7.5	0.0	12.4	7.4	5.5	2.5	20.3	-1.6	31.5	60.7	3.6	2.3	3.7	61.7	277.8
KOR	174.7	12.1	385.0	0.0	8.2	2.7	1.2	13.5	11.0	8.7	66.0	19.1	3.6	19.9	71.7	797.5
IDN	-3.6	1.7	-11.2	-6.5	0.0	-4.4	2.6	8.5	1.6	19.7	0.4	-0.2	2.6	4.6	2.2	18.0
MYS	-137.5	-11.9	-47.0	-15.0	-4.5	0.0	-1.4	-71.6	2.4	37.2	-9.3	-7.6	-53.5	-9.9	-76.2	-405.8
PHL	-163.6	-1.1	-19.7	-9.1	-0.5	-1.4	0.0	-1.9	0.1	3.0	-5.0	-2.3	-1.4	0.0	-14.5	-217.4
SGP	-3.2	0.7	-11.6	-2.5	5.2	-4.9	10.8	0.0	-2.1	32.8	-2.3	0.1	0.7	9.1	-3.1	29.8
THA	11.7	0.3	-63.2	-0.8	13.8	104.8	0.2	2.4	0.0	60.1	-1.5	-0.9	1.7	19.0	2.2	149.7
CHN	-36.4	-2.1	-95.1	-25.8	2.5	-12.2	-0.7	-2.3	31.2	0.0	-56.1	0.1	-1.0	6.6	-15.2	-206.3
HKG	-14.9	-1.3	-3.8	-0.2	0.3	0.2	0.7	0.1	0.8	58.2	0.0	-0.1	0.0	0.1	-1.1	39.0
LTN	578.6	8.7	-27.8	6.0	4.9	4.5	7.4	6.9	24.5	110.3	2.1	245.9	15.4	56.9	91.7	1136.0
SSA	46.2	0.0	-0.5	-0.2	0.0	-0.2	0.0	0.2	0.1	0.1	-0.3	0.3	5.8	0.3	1.1	52.9
SAS	-25.5	-0.7	-7.4	-12.1	2.6	-2.7	-1.7	-1.8	21.1	0.0	-2.2	-0.5	-6.8	4.3	-27.3	-60.5
ROW	358.4	5.3	90.5	-2.2	4.2	-1.9	3.1	6.6	12.9	16.8	2.3	11.1	7.8	6.4	87.8	609.0
WLD	1,266.3	103.8	219.3	-54.6	79.2	114.0	165.7	23.5	194.1	499.3	84.8	447.6	122.8	194.3	1,026.3	4,486.4

Table A1. (*continued*)

Beverages and tobacco

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	RAW	WLD
IND	126.1	51.4	743.7	137.9	23.5	27.8	48.1	216.9	76.4	189.8	143.8	57.2	30.2	16.1	212.0	2,101.0
AUS	3.7	-4.1	0.6	0.7	0.3	0.3	0.4	1.5	0.2	1.2	0.3	0.1	0.0	0.2	2.3	7.6
JPN	-7.3	-1.0	0.0	16.7	0.1	0.2	0.4	2.8	1.2	6.8	-7.7	0.0	0.0	1.4	-3.4	10.1
KOR	18.3	0.3	0.7	0.0	0.9	0.3	1.8	2.0	0.0	0.8	5.8	0.1	0.0	0.0	3.8	34.8
IDN	-10.4	-0.2	3.8	0.0	0.0	0.4	0.0	1.9	0.0	0.2	-2.2	-0.2	-0.2	-0.3	-6.4	-13.4
MYS	-0.4	-0.5	-0.4	0.0	0.3	0.0	4.8	-3.5	0.0	0.1	-1.7	-0.3	0.0	-0.6	-2.2	-4.5
PHL	-5.7	-0.5	0.3	1.2	0.1	0.3	0.0	0.1	0.0	1.1	-2.0	-0.7	0.0	0.0	-2.3	-8.2
SGP	0.8	0.6	270.8	77.9	0.7	16.8	1.8	0.0	1.7	6.8	3.0	-0.1	-0.1	2.3	16.7	399.7
THA	9.1	-0.1	9.3	1.1	1.7	0.1	7.1	3.6	0.0	23.3	1.2	1.5	0.0	0.3	2.7	61.0
CHN	-12.5	-0.3	-5.9	17.0	8.0	0.1	0.9	9.2	0.7	0.0	-36.0	-0.5	-0.2	-0.8	-18.1	-38.6
HKG	-1.8	-0.7	-2.8	7.4	-0.1	2.7	3.2	0.5	0.1	64.5	0.0	0.0	0.0	0.0	-15.1	57.7
LTN	175.0	-2.0	23.0	0.2	1.0	1.1	16.1	3.0	0.0	1.1	1.2	17.0	0.4	2.3	6.9	246.2
SSA	102.9	-2.0	15.3	0.0	2.3	0.1	28.1	0.6	0.0	40.7	0.1	0.3	-0.5	0.1	-6.6	181.4
SAS	7.0	-0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.5	0.0	0.0	-0.9	-1.1	-14.9	-9.6
ROW	197.0	0.0	25.7	6.9	1.8	0.5	5.1	4.4	-0.2	8.4	2.8	3.1	0.6	0.3	35.0	291.5
WLD	601.9	40.8	1,084.1	266.9	40.6	50.7	117.9	243.1	80.0	345.1	108.6	77.4	29.3	20.1	210.2	3,316.6

Table A1. (*continued*)

Minerals

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	643.2	7.8	416.4	64.2	8.7	11.3	-7.2	11.3	37.2	15.1	51.9	61.0	3.1	208.3	535.1	2,067.4
AUS	-50.4	0.6	407.1	34.9	9.5	7.2	-3.7	11.5	31.8	409.2	4.2	-3.6	0.0	76.3	10.9	945.4
JPN	-44.3	-0.2	0.0	-7.6	0.8	0.8	-1.3	-1.0	0.0	-0.5	-10.3	-9.3	0.0	-1.1	-13.9	-88.0
KOR	-3.8	-0.3	-1.9	0.0	0.1	0.0	-0.2	-0.2	-0.9	3.9	-0.5	0.0	-0.2	-0.2	-1.4	-5.7
IDN	-189.1	-97.4	-1,110.5	-223.0	0.0	-3.7	-15.6	-32.2	0.3	-196.9	-19.8	-0.2	-0.2	-2.5	-137.2	-2,028.1
MYS	-94.3	-52.4	-529.1	-182.3	-45.9	0.0	-60.9	-300.1	-62.2	-29.1	-0.6	-25.3	-0.1	-51.7	-34.1	-1,467.9
PHL	-8.0	0.0	-29.9	-1.9	0.0	-0.7	0.0	-1.4	-0.3	-2.1	-4.6	-0.2	-0.7	0.0	-1.6	-51.4
SGP	-5.5	1.4	0.0	0.0	0.1	-0.3	-1.5	0.0	-1.5	2.3	-0.7	0.0	-0.8	-2.9	-1.5	-11.1
THA	-68.8	-9.7	-22.9	-4.9	-0.3	-1.0	-0.8	-4.8	0.0	1.0	-10.8	-0.1	0.0	0.7	-10.5	-133.1
CHN	-54.0	-1.4	-110.2	-10.9	2.2	1.9	-3.4	-24.3	2.5	0.0	-17.2	-7.1	0.0	5.0	-33.7	-250.7
HKG	-33.3	-0.5	-4.7	-0.7	0.0	0.0	-0.3	-0.3	-32.7	-27.3	0.0	-0.1	0.0	-1.2	-8.8	-109.8
LTN	-8.8	0.8	251.6	63.1	6.8	6.1	-2.2	0.1	3.4	27.5	0.8	164.5	0.2	4.1	73.1	591.1
SSA	-60.4	0.1	12.1	6.7	0.2	1.1	-2.5	0.6	2.7	-5.5	0.0	40.0	5.1	29.5	76.1	106.0
SAS	-236.2	-3.2	-61.6	-16.1	-1.4	-0.6	-0.5	-6.1	-64.3	-21.7	-45.8	-0.1	-0.1	-11.3	-15.8	-484.8
ROW	-143.4	14.9	2,281.2	571.9	34.8	7.0	146.3	310.4	399.7	-28.3	28.9	-145.4	-3.7	-12.6	-56.1	3,405.6
WLD	-357.2	-139.6	1,497.6	293.4	15.6	29.0	46.2	-36.5	315.8	147.7	-24.5	73.9	2.5	240.3	380.7	2,484.9

Table A1. (*continued*)

Textiles and clothing

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	-6,124.5	182.9	798.6	454.0	337.8	357.7	218.5	163.7	154.5	613.4	294.8	779.3	120.9	133.7	2,063.9	549.3
AUS	-121.6	40.8	-15.0	4.4	27.7	11.5	4.2	1.9	5.1	-28.9	0.0	-0.3	-0.3	1.5	-4.5	-73.5
JPN	-1,494.5	-13.6	0.0	253.2	252.1	504.4	116.4	30.3	109.9	1,160.2	-71.2	-8.3	-6.8	70.4	-261.3	641.1
KOR	2,844.4	140.6	2,072.3	0.0	1,337.8	379.0	314.0	289.4	349.8	874.7	1,458.8	418.8	57.1	561.4	937.0	12,035.3
IDN	17,220.7	10.2	101.0	79.1	0.0	386.2	26.7	489.8	25.0	15.1	34.0	9.2	2.4	27.4	61.2	18,488.0
MYS	34,027.2	-6.0	-12.0	2.5	18.2	0.0	17.8	57.5	11.7	16.0	-11.0	-3.2	-1.1	-3.3	-26.5	34,087.8
PHL	4,702.8	4.5	38.0	7.1	6.1	10.5	0.0	11.4	5.6	3.7	20.7	10.5	0.1	0.9	20.0	4,842.0
SGP	-289.4	2.0	2.1	3.5	24.4	1,680.4	15.0	0.0	67.3	8.8	3.9	-0.2	-0.8	53.3	-21.2	1,548.9
THA	4604.9	34.1	155.8	31.7	13.9	122.4	24.8	85.4	0.0	13.5	40.9	38.8	38.4	46.0	189.0	5,439.4
CHN	38,871.3	175.8	865.9	214.0	43.2	150.0	26.4	72.4	33.0	0.0	686.0	-6.4	-5.5	22.8	-154.6	40,994.4
HKG	-2,194.4	40.4	4.1	14.1	113.7	478.6	164.8	30.6	53.2	3,755.0	0.0	-34.5	-13.2	74.2	-211.4	2,275.4
LTN	-198.6	-1.7	-1.7	15.8	5.6	1.0	1.0	1.3	3.7	49.3	-0.4	-36.6	-2.0	2.9	-20.5	-180.7
SSA	-694.8	-0.1	0.0	0.4	0.5	0.6	0.0	1.0	0.2	0.2	-0.2	-9.9	-9.8	-0.1	-7.6	-719.6
SAS	15,311.9	-60.5	-162.3	21.1	15.2	162.9	7.5	-13.8	8.2	-1.9	-96.6	-22.7	-36.8	19.9	-570.3	14,581.9
ROW	-13,021.6	5.2	52.7	134.8	631.7	1,255.4	317.2	93.1	299.7	1,144.4	43.5	-17.4	-11.6	88.9	-424.9	-9,408.8
WLD	93,443.8	554.7	3,899.7	1,235.6	2,827.9	5,500.9	1,254.2	1,313.9	1,126.8	7,623.5	2,403.0	1,117.1	1,31.2	1,100.3	1,568.4	125,101.0

Table A1. (*continued*)

Other manufactures

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	22,139.0	2,623.3	8,675.8	5,144.2	1,751.2	665.8	572.6	1,280.1	1,546.3	4,593.9	1,858.7	6,141.3	988.8	2,053.6	18,444.0	78,478.6
AUS	73.3	269.3	284.4	189.4	-1.5	21.6	24.5	123.9	-31.7	218.1	86.5	21.5	3.0	36.0	42.1	1,360.3
JPN	27,091.8	505.6	0.0	1,169.6	164.3	-365.7	10.9	-1,131.8	757.1	1,910.6	-776.7	-784.6	-211.7	319.1	-4,362.1	24,296.4
KOR	1453.7	198.9	1,282.5	0.0	362.5	81.6	50.9	354.5	139.3	342.8	383.9	289.4	181.6	226.0	455.6	5,803.1
IDN	-603.1	-6.9	22.5	-61.2	0.0	-15.6	6.2	-117.7	-38.9	208.5	-32.0	-11.0	-10.9	2.7	-176.0	-833.3
MYS	-3,172.8	-40.4	-395.2	-31.3	-30.7	0.0	-14.1	-1,421.4	66.7	73.7	-236.3	-41.9	-25.5	-14.7	-303.2	-5,587.2
PHL	180.4	22.8	172.9	37.1	9.8	27.2	0.0	27.5	93.8	34.7	42.8	4.4	0.5	10.8	14.7	679.4
SGP	-253.6	259.4	56.8	192.7	39.0	-169.6	30.8	0.0	-180.2	219.6	147.9	-35.8	-51.3	57.8	-349.1	-35.5
THA	1,004.0	33.3	676.2	73.2	49.8	105.5	17.3	380.3	0.0	42.8	182.6	14.4	11.1	28.1	166.8	2,785.4
CHN	-194.1	260.1	552.9	158.4	29.3	31.0	20.4	25.5	59.4	0.0	2,242.6	34.0	9.4	154.2	111.2	3,494.3
HKG	-659.6	25.2	98.0	106.3	3.6	-43.3	13.1	-77.7	30.4	4,894.5	0.0	17.7	1.0	61.5	-17.6	4,453.0
LTN	974.6	57.5	315.7	69.5	20.5	17.8	-2.0	87.1	-102.9	-4.7	60.4	1,837.5	26.1	76.4	185.4	3,619.1
SSA	-51.0	1.0	23.1	-10.2	-1.9	7.5	1.0	12.6	-37.5	-0.6	9.4	13.4	0.4	19.7	14.0	0.7
SAS	-581.3	1.5	-18.7	-29.3	-14.1	-4.2	-3.9	-28.4	-12.0	-7.3	-12.1	0.6	-30.6	7.0	-197.2	-930.0
ROW	7,842.4	693.8	1,934.2	642.3	225.7	367.2	96.5	527.6	596.0	1,378.1	1,142.5	793.8	73.6	578.2	3,592.0	20,483.9
WLD	55,243.6	4,904.4	13,681.0	7,650.6	2,607.5	726.9	824.2	42.2	2,885.8	13,904.7	5,100.2	8,294.8	965.5	3,616.4	17,620.6	138,068.0

Table A1. (*continued*)

Services

	NAE	AUS	JPN	KOR	IDN	MYS	PHL	SGP	THA	CHN	HKG	LTN	SSA	SAS	ROW	WLD
IND	1,582.8	196.9	3,291.5	433.9	164.7	163.9	48.4	242.9	14.3	182.8	375.9	372.4	188.5	316.6	1,629.4	9,204.9
AUS	-57.0	4.2	264.3	37.0	17.2	25.1	4.2	9.6	0.0	0.9	15.5	-2.4	-0.2	17.3	-17.0	318.6
JPN	-1,799.8	-86.9	0.0	-59.0	11.3	29.0	7.8	-54.3	-7.0	-9.9	-41.5	-223.0	-61.6	-8.7	-928.3	-3,231.9
KOR	-443.8	-26.5	-184.6	0.0	1.3	7.5	1.5	-26.7	-1.3	-2.1	-14.8	-118.5	-90.7	-11.8	-507.2	-1,417.9
IDN	-51.2	-5.3	-141.3	-7.2	0.0	0.0	-0.1	-9.0	-0.1	-0.6	-5.8	-3.0	-2.1	-1.4	-40.3	-267.3
MYS	-422.6	-24.4	-484.4	-38.0	-10.2	0.0	-2.9	-206.2	-2.6	-1.6	-37.0	-16.5	-25.2	-30.0	-110.7	-1,412.4
PHL	-262.0	-6.7	-226.3	-10.5	-1.7	-0.6	0.0	-9.4	-0.6	-0.4	-12.7	-7.9	-1.3	-1.8	-38.2	-580.4
SGP	-326.0	-23.6	-0.9	3.9	12.7	88.7	4.7	0.0	-2.5	-3.0	20.1	-25.9	-13.8	12.6	-157.9	-410.8
THA	-102.9	-3.6	3.8	1.2	1.9	5.0	0.4	0.1	0.0	-0.5	25.1	-9.6	-6.4	1.3	-40.2	-124.3
CHN	-74.1	-61.0	-28.1	-4.7	7.7	9.9	7.3	-6.4	-1.2	-1.4	-0.3	-83.9	-29.8	-0.5	-103.3	-370.1
HKG	-1,276.5	-44.9	-210.1	-80.8	-3.8	0.1	-3.0	-79.1	-2.3	-74.8	0.0	-70.3	-24.1	-27.8	-488.6	-2,386.3
LTN	45.0	2.0	236.5	29.6	6.3	4.2	1.7	7.0	0.1	1.5	10.2	13.9	2.0	9.1	7.9	377.0
SSA	-66.2	0.0	16.5	1.3	0.7	1.1	0.4	1.2	0.0	0.1	1.0	-2.8	-1.4	5.3	-5.3	-48.0
SAS	-432.4	-9.4	-87.2	-7.5	-0.8	1.0	0.0	-6.6	-1.5	-0.6	-9.0	-6.0	-21.3	-10.8	-187.3	-779.4
ROW	260.3	21.9	1,109.2	157.8	42.9	42.1	19.8	77.4	1.8	16.9	174.9	9.0	12.1	123.1	113.2	2,182.4
WLD	-3,426.5	-67.3	3,558.8	456.9	250.0	377.0	90.3	-59.8	-2.9	107.3	501.7	-174.5	-75.4	392.5	-874.1	1,054.2

Acronyms: NAE: North America and European Union; AUS: Australasia; JPN: Japan; KOR: Republic of Korea; IDN: Indonesia; MYS: Malaysia; PHL: Philippines; SGP: Singapore; THA: Thailand; CHN: China; HKG: Hong Kong; LTN: Latin America; SSA: Sub-Saharan Africa; SAS: South Asia; ROW: Rest of the world; WLD: World.

E. CHALLENGES AND OPPORTUNITIES FOR COUNTRIES IN THE ESCAP REGION

The ESCAP region includes the fastest growing economies in the world, such as China, Hong Kong, the Republic of Korea, Indonesia, Malaysia and Thailand. It also includes countries which have undertaken economic reforms and which appear to be set on a new, higher growth path, such as India and New Zealand. It includes some transition economies such as Lao People's Democratic Republic, Mongolia, and Viet Nam which are struggling to establish market economies. And it includes the Pacific islands countries which have generally been unsuccessful in establishing policies which will put them on to a path of sustained growth. While there is this wide range of economic performance levels, the region has facing it an environment which is highly favourable to strong economic growth. Three factors stand out. First, the China-centred growth pole of China, Hong Kong, and Taiwan Province of China provides a huge, rapidly expanding income base. These economies, together with Japan and the Republic of Korea and the rapidly growing South-East Asian countries of Indonesia, Malaysia and Thailand, have been the main source of growth in imports of foodstuffs and raw materials over the past decade or so. Second, the Uruguay Round agreements will provide increasingly easier market access both within the region and importantly into the major markets of the United States and Western Europe. And there will be less competition from the subsidized exports of the United States and the European Union. As well, with the APEC thrust towards "open regionalism" there is within the region a generally favourable attitude towards freer trade in goods and services. Third, there are several good models of economic management within the region which other countries can learn from and after which to fashion their own policies.

As several of the fast-growing developing countries such as Chile, Indonesia, Malaysia, and Thailand have shown, development of the agricultural sector can be the first step on the path to higher growth (see World Bank, 1994). Faster growth in the agricultural sector releases capital and labour to other sectors (such as manufacturing) and enables these other sectors to grow without incurring rapid increases in wages. The Uruguay Round has provided the basis for a favourable environment for an expansion of agricultural exports in the developing countries of the ESCAP region – unlike when countries such as Malaysia and Thailand were in this phase of their development. Countries such as the Lao People's Democratic Republic, Myanmar, and Viet Nam should recognize that this opportunity presents itself and take advantage of it.

The rapid growth of the large developing countries within the ESCAP region is generating a huge demand for primary commodities of all kinds. As these countries increase their per capita incomes from very low levels, their consumption of foodstuffs is growing rapidly. As time has shown, their domestic agricultural base is unable to grow at the same rate. While agricultural production may grow at annual rates of up to 4 per cent for short periods, over the long run it maintains a annual growth rate around 2 per cent. This means that imports of foodstuffs have to increase rapidly to meet the increasing demand. As incomes grow, moreover, the composition of diets changes – usually from staples such as rice and maize to wheaten products. Also, the quantity of meats, fruits and vegetables, and dairy products consumed increases (see, for example, Ingco, 1990 and 1991). As per capita incomes grow further, food consumption demands become more sophisticated, with demand shifting from the raw products to products in processed form. This change leads to a change in the form of imports, but more importantly, to the establishment of food processing activities within the economies which are growing rapidly. Thus, we have seen in recent years, intense investment activity by United States processing firms in South-East Asia where rapid economic growth has been underway for some time.

This phenomenon of rapidly expanding food consumption in the region offers those countries with efficient agricultural sectors tremendous opportunities for export growth. To make the best of the opportunity the exporters need to maintain good quality product standards as well as high standards in processing, packaging and storage. Perhaps the most difficult part for newcomers is with export marketing. Here it has been shown that joint ventures with experienced firms are most successful.

An unfortunate aspect of trade policies of many countries in the region is significant tariff escalation against imports of processed foodstuffs and raw materials (see Safadi and Yeats, 1994). Industrial countries have been long criticized for their tariff escalation which discriminates against exports of processed products from developing countries. But developing countries are just as guilty of this. Such policies have the effect of not allowing individual countries to exploit fully their comparative advantage in different products. Thus, individual countries and the region as a whole have lower incomes than they otherwise would enjoy. With the fast-growing demand for higher quality diets, the removal of tariff escalation should be a high priority within the region.

Turning now to the results of the trade model simulation, these confirm the basic findings of previous studies that world agricultural prices tend to rise when agricultural trade is liberalized. This is true regardless

of the participation of developing countries in trade liberalization. Although developing countries' participation may not dampen the upward pressure on world prices resulting from industrial country liberalization, their participation is critical in determining the welfare outcome of the Uruguay Round agreements. If developing countries do not participate in trade liberalization they, as a group, are likely to suffer net welfare losses from industrial country liberalization. If they do, they will gain.

Some heavy net food-importing developing countries lose, regardless of their participation in trade liberalization, but they will lose more if they do not participate. Most developing countries, including some net food importers, will gain from global trade liberalization. Low-income Asian developing countries in the ESCAP region fare especially well.

Changes in world prices for individual commodities have several important implications for countries in the ESCAP region. Large rice producers and exporters, such as China, India, Pakistan, Thailand, and Viet Nam, will undoubtedly benefit from the higher price of rice, and net importers may have to pay more or reduce their imports of rice. Most countries in the ESCAP region are net importers of wheat. As a result, import bills for wheat may increase. For large net wheat importers such as Bangladesh and Indonesia, this means that significantly increased foreign exchange earnings may be required to finance imports. If country is both a net rice exporter and a net wheat importer, such as China, the impact of the price changes in rice and wheat on the trade balance may be offset.

Our model does not explicitly include cotton, one of the important cash crops in the ESCAP regions. If the price change for non-grain crops in table 14 in Section D is any indication of what may happen in the cotton market, the world price for cotton is likely to rise as a result of the Uruguay Round trade liberalization. Two forces drive the prices for non-grain crops, and that of cotton in particular. Demand for cotton will rise following reductions in protection in both industrial and developing countries. The abolition of the MFA will also boost demand by developing countries for cotton and other textile fibres. This is evident from the higher price increase resulting from the implementation of the complete Uruguay Round package than from agricultural liberalization alone (table 4).

Vegetable oils and horticultural products (vegetables and fruits) are also included in the non-grain crops category. Again, if changes in the prices for these products follow the overall trend of non-grain crops, world prices for them are expected to rise following trade liberalization. In general, the Uruguay Round trade liberalization tends to boost world demand

for agricultural commodities and their prices are therefore subject to upward pressure. One should, however, be cautious in inferring price changes for specific commodities from the overall trend of broader commodity categories, as factors pertaining to specific commodities may not have been incorporated into our model.

There are large variations in the impact of the Uruguay Round trade liberalization on individual agricultural sectors. However, the ESCAP region as a whole can only expect limited increases in net exports of rice and milk products, and the overall net agricultural imports of the region increase considerably, largely as a result of a substantial expansion of imports by Japan.

In examining the ability of the ESCAP region to finance its agricultural imports, one should look at the impact of the Uruguay Round trade liberalization on the overall trade balance, rather than look at trade balances in agricultural commodities alone. Despite the considerable increases in net agricultural imports, the region is in fact in a much better position to finance its imports in general and agricultural imports in particular, thanks to the abolition of the MFA and tariff reductions. It is also important to note that the overall terms of trade for developing countries, and developing countries in particular, is likely to improve as a result of the Uruguay Round agricultural reform. It is the MFA reform and tariff reductions that are more likely to have an adverse terms-of-trade effect on the developing countries in the region. This suggests the Uruguay Round trade reform should be viewed as a comprehensive package, and its impact should be put in an economy-wide perspective. Policy makers should, therefore, respond to the reform both at the microeconomic and macroeconomic levels. This principle should also apply in the analysis of the impact of the Uruguay Round reform on other aspects of the agricultural sector, such as production and employment.

The impact of trade liberalization on the production of individual commodities in the ESCAP regions varies considerably. In general, production increases most in commodities which have been highly protected in industrial countries and are subject to liberalization in the Uruguay Round. Rice production is little affected across the ESCAP region. Hong Kong's huge rise in rice production reflects its tiny production base. Wheat production expands in all wheat-growing economies in the ESCAP region except for Japan, Malaysia, the Philippines and South Asia. The production of other grains increases only in Thailand and China. The output of non-grain crops increases in all countries except Japan, the Republic of Korea and Indonesia. Cotton, vegetable oils, and fruits and vegetables are the most important products in this latter category, and these commodities are projected

to experience output expansion. The meat and milk product sectors are perhaps the largest beneficiaries of the Uruguay Round trade liberalization, as they experience the largest output increases in some countries, such as Australasia and Indonesia. However, Japan and the Republic of Korea may suffer significant reductions in their production of these products. Other countries and regions, such as the Philippines, China and South Asia may experience minor declines in production.

Employment, rural wages and land prices mirror the changes in production. Therefore, sectors which experience increases in production also tend to benefit from rises in employment, wages and land prices. More labour-intensive sectors enjoy greater increases in employment than less labour-intensive sectors. This may explain part of the substantial increases in employment in meat and milk product sectors. For some countries, considerable increases in employment in wheat and non-grain crops are largely the result of the greater expansion of production in these sectors.

By boosting agricultural production, trade liberalization has a number of favourable consequences for the rural poor in developing countries. Wages will increase and employment will tend to increase either in the rural or urban sector, and land prices will also rise to the benefit of small landholders. The most likely losers from agricultural trade liberalization are the urban poor in developing countries, but the abolition of the MFA may well offset the potential losses from agricultural trade liberalization. In the case of Japan and the Republic of Korea, however, agricultural trade liberalization means substantially cheaper food for the urban population. In other countries, if the urban poor do become worse off, government policies should be targeted to help them. In the longer run, the best way to reduce urban poverty is to increase employment through economic growth. The Uruguay Round trade liberalization provides developing countries with greater market access for their manufactured exports as well as for their agricultural exports. For the least developed countries which have yet to develop a manufacturing sector, the phasing-out of the MFA provides an important opportunity. Appropriate domestic policies should be put in place to exploit this opportunity and provide greater employment in the process.

One frequently overlooked consequence of trade liberalization is its stimulation of investment. Trade liberalization increases agricultural profitability as a result of higher prices for agricultural output and lower prices for inputs. This leads to increases in production, which in turn stimulates investment. Obviously, sectors in which production increases the most would have the greatest expansion in investment, other things

being equal. One therefore expects that investment in wheat, non-grain crops and livestock products will increase most in countries as the result of the Uruguay Round trade liberalization.

The incentives to investment in agriculture in the ESCAP regions, and in developing countries in general, can have long-term dynamic effects as well as short-term static effects. With improved internal terms of trade for agriculture, farmers would have greater incentives to invest in infrastructure facilities in expectation of permanently more favourable conditions for agricultural production. They are also more likely to introduce new technologies and farming practices.

Greater export-orientation in agriculture provides more opportunities for technology transfer from abroad. Such transfer can occur through several channels. Increased foreign exchange earnings allow farmers to purchase more advanced farm equipment and intermediate inputs (such as pesticides and fertilizers). Farmers can learn from exporting about product quality control and marketing. Greater openness provides opportunities to produce higher value added products for international markets, and this is in turn enhances the skills of farmers. Although agriculture involves less learning by doing than manufacturing activity, greater openness should help farmers acquire appropriate technology and better farming practices.

Research has shown that if domestic trade reform is pursued, technological progress is likely to ensure. With such induced technological change, the chance that developing countries will benefit from the Uruguay Round trade liberalization is greatly increased. In fact, the positive welfare impact of any modest technological improvement is likely to overpower any potential adverse impact of trade liberalization. While the Uruguay Round is undoubtedly important, its static impact is relatively small for most developing countries. Developing countries should direct their policy focus to increasing the long-term dynamic gains from trade liberalization by fostering technological progress.

A question of great importance for the developing countries of the region is whether the Uruguay Round Agreement on Agriculture will act as a deterrent to these countries from ultimately subsidizing their agricultural sectors? Industrial countries have long subsidized their declining agricultural sectors, and in the ESCAP region, in the more industrialized countries of the region, there is inverse debate as to the merits of subsidizing or otherwise protecting the agricultural sector.

The immediate pressures for this kind of action appear to be two-fold. First, the increasing openness of the economy leads to greater

instability of domestic agricultural prices facing producers and consumers. Second, some agricultural regions do not realize the same gains in income that the remainder of the economy experiences from the rapid economic growth. There is then concern about the effects of income disparity and price instability on socioeconomic stability and assistance to the agricultural sectors in extended in an attempt to correct the income disparity.

The Uruguay Round agreements should prevent developing countries from turning from taxing their agricultural sectors to subsidizing them as they develop. Protection cannot increase from zero or negative rates. Where countries are protecting agricultural industries and they have bound their tariffs at a level above the actual rates, they will be able to increase protection. If there is a perceived need to do something about relatively low income levels in certain agricultural regions, structural adjustment policies are on the long term the most preferable options.

F. CONCLUSIONS AND RECOMMENDATIONS

Model simulations such as those reported here cannot make accurate projections. They are best thought of as describing tendencies – in prices, flows of exports, production, welfare, etc. Therefore, the results should be interpreted in terms of what these tendencies imply for directions to take in trade and other policies. That is how they are used in this chapter – to point to the important policy changes which should be sought by countries in the ESCAP region.

The Uruguay Round ended with negotiated agreements well short of what many countries had hoped for. This was particularly the case for the Agreement on Agriculture. It was a far cry from the original negotiating position of the Cairns Group and the United States. But to look on the bright side, agriculture is at last part of the GATT process and some reductions in protection, domestic supports and export subsidies were agreed. Thus, there is scope for some gains in the short term and hope for larger gains in the long term.

The Uruguay Round agreements and the rapid growth already being experienced by many countries provide a very optimistic environment for the agricultural exporting countries of the region – both those already exporting and those potentially able to do so under appropriate policies. Development of the agricultural sector is a primary step to take on the path to faster growth. Putting policies in place to ensure this must be a priority for those countries which have not already done so. Now is an excellent time to take this step as the opportunities for export growth both

in primary and manufactured products will ease the costs of adjustment by providing the opportunity for strong employment growth.

Agricultural sectors are often subject to discriminatory taxes on production and exports which inhibit investment, productivity growth and export growth. Agriculture is also often discriminated against by import restrictions on its inputs such as fertilizers, pesticides, and machinery. The most important restriction on agriculture in some cases is an over-valued exchange rate which makes its exports more expensive than they would otherwise be to the potential importers. *Correcting such discriminatory policies is the first step to helping agriculture to move to a higher growth path.*

To encourage investment and technological change in the agricultural sector and in the processing sector, of great importance is equal treatment for foreign and domestic investors. Foreign direct investment can be a major source of technical change in developing countries. It is also important for helping the marketing of products on the world market. *Therefore, removal of barriers to foreign investment and ensuring that foreign investors are treated just the same as domestic investors in all respects is essential.*

Most of the trade expansion flowing from the Uruguay Round will be on an intraregional basis. But this expansion will be greatly over-shadowed by the trade expansion arising from the fact that several countries of the ESCAP region will be growing rapidly (and hopefully this number will be added to). The opportunities for trade in processed agricultural products should be enormous, given the rapidly rising per capita incomes in the region. But an important restriction on the development of trade in processed products within the region is the tariff escalation practised by many of the countries of the region.

A coordinated effort within the region to reduce the extent of tariff escalation could be a very worthwhile endeavour. It could be the focus of an ESCAP-based effort to promote trade expansion within the region. As the simulations of the trade model have shown, most of the gains from any MFN-type "open regionalism" movement towards lower trade barriers within the region will accrue within the region. Reductions in tariff escalation by at least a majority of countries does seem to be an achievable objective.

Because agricultural trade liberalization is such an important issue to many countries in the ESCAP region, another activity which would appear to be in their interest would be to see that the Uruguay Round agreements on agriculture negotiated are adhered to. This would mean

seeing that the major participants are in compliance with their commitments. It could also mean ensuring that there is a full, thorough assessment of progress in implementation of the agricultural agreements in the target year, 1999. And it could also mean ensuring that further liberalization of agriculture is part of the next GATT round.

In the Uruguay Round the developing countries agreed to smaller reductions in protection than those agreed to by the developed countries. As the model simulation results reported here show, agricultural liberalization by the developing countries generates benefits to them, not costs. If it is true that trade liberalization has the effect of increasing productivity growth in an economy, then agricultural trade liberalization can be an extremely important generator of increases in welfare. It was shown that agricultural trade liberalization can offset the negative effects on food importers of higher world prices stemming from the implementation of the Uruguay Round. In many cases, this is because the agricultural sectors are taxed in various ways and removing this taxation leads to increased domestic production. In other cases, agricultural sectors are heavily protected and removing this protection leads to gains to consumers which more than offset the loss to producers. *Increasing awareness among policy-makers of the costs of agricultural protection would lead to significant benefits both to them and their trading partners.*

Many countries which have protected their agricultural sectors have been able to do so due to the benefit of economic growth. Previously these sectors were taxed. This syndrome of moving from taxing to subsidizing the agricultural sector as per capita incomes increase appears hard to resist for political reasons. However, as experience in the European Union and the United States and more recently in Japan and the Republic of Korea has shown, protection of agriculture is economically unwise, damaging both the country itself and its trading partners, and is very difficult to unwind. Other industrializing countries in the region may have started down this road. It appears that the Uruguay Round agreements have arrived in time to prevent further action along these lines. For example, in China domestic agriculture prices were previously well below world prices and have now been moved into line with world prices. Domestic discussion is intense over whether or not to subsidize agriculture because agricultural incomes are falling behind incomes in other sectors. *Investigation into alternate measures to treat problems giving rise to pressures to subsidize agriculture, is called for.* However, it should be recognized that income disparities are the signal for labour resources to move out of one sector and into another. Lower incomes in agriculture is a signal for labour to move out of agriculture. This is an important part of the development

process as in developing countries most of the labour is in agriculture. Domestic price stabilization schemes have proven to be costly and often ineffectual in trying to provide producers and consumers with prices less volatile than those on international markets. *Countries should be encouraged to explore the use of financial market instruments such as commodity futures and options in seeking to provide protection against commodity price instability.*

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II. THE ASIA-PACIFIC REGION, TROPICAL PRODUCT EXPORTS AND THE URUGUAY ROUND

by

Michael Davenport

A. INTRODUCTION

This chapter looks at the effects of the Uruguay Round agreements on tropical product exports from the ESCAP region. In the spirit of the Round it concentrates on the impact of new market access opportunities on trade flows. It uses a mixture of modelling approaches because to date there is no general equilibrium model which can adequately deal with the complexities of trade preferences and non-tariff barriers (NTBs).

The principle worries among the developing countries about the effects of the agreements have focused on the erosion of preferences, mainly through the various generalized system of preference (GSP) schemes and through the special access that the African, Caribbean and Pacific countries have to the European Union market through the Lomé Convention. The Uruguay Round most favoured nation (MFN) tariff cuts, at least as far as tropical products are concerned, are in fact substantial but at the same time there is an erosion of preferential margins. However, the restricted coverage and utilization of the GSP, and the fact that most GSP schemes are in any event likely to be radically revamped in the near future (not specifically because of the Uruguay Round though that will have a bearing on the nature of the reforms), means that the erosion of the GSP preference margin is probably of limited significance, though that of the African, Caribbean and Pacific Group of Countries (ACP) may be more important.

On balance the degree of tariff escalation by the developed countries on tropical products seems to have been reduced through the Uruguay Round. To what extent this will lead to an increase in the degree of processing by the countries in the ESCAP region is difficult to predict. The relations between tariff escalation or effective protection and value added in exports is poorly understood. It is worth noting that GSP – and even more so Lomé – beneficiaries have been exempt from the problems of tariff escalation over a wide range of products. On the whole, however, they have not used this to move up the processing chain. Of course, there are a great number of other factors involved, but still it does not encourage the belief that reductions in the escalation of MFN tariffs will suddenly elicit a major response in the increased processing of export products.

It cannot be said that the results reported here suggest that the Uruguay Round is going to have a major impact on the region in the tropical products sector. As always one is unhappy about the ability of models, even general equilibrium models, to get at the indirect or 'dynamic'

effects of changes in trade regimes, the effects on investment, including foreign direct investment, with all that implies for the transfer of skills and technology. The appropriate policy response to any loss in export or domestic markets brought about by the erosion of preferences, or perhaps more importantly through the dismantling of preferences in the ESCAP region itself, will be through measures which support investment in those sectors with a real comparative advantage in those markets.

B. THE URUGUAY ROUND CLASSIFICATION

Owing to the demands of, mainly, the European Union and the United States of America, the coverage of the negotiations on tropical products was restricted from the outset of the Uruguay Round to exclude certain products produced, or competing with products produced, in the developed countries. Thus, cane sugar, meat, soya and olive oil, millet, sorghum and other grains were all excluded from the tropical products negotiations. The remaining tropical products consisted of seven groups:

(a) Tropical beverages (tea, cocoa and coffee)

(b) Spices, cut flowers and plants

(c) Certain oil seeds and vegetable oils (caster, palm, coconut oils and oilcakes and some minor seeds and oils)

(d) Tobacco, tobacco products, rice, cassava (manioc) and other tropical roots

(e) Tropical fruits and nuts

(f) Jute and hard fibres

(g) Tropical woods and wood products (excluding pulp and paper), natural rubber and rubber products (excluding shoes and tyres).

A number of arguably tropical products (fish and fish products) were included in the natural resource-base products negotiations, some (cotton, silk and wool fibres) in the textiles and clothing negotiations and still others (cane sugar, grains, meats) in the agricultural goods negotiations. After the failure to reach a final agreement scheduled for December 1990 the number of negotiating groups was reduced to seven, with the agricultural group absorbing most of the products originally dealt with in the tropical products group. This Chapter does not deal with rice which is covered in other chapters.

C. TROPICAL GOODS EXPORTS OF THE ESCAP REGION

Table 1 shows the broad picture of tropical product exports from the ESCAP region and how they contribute to merchandise exports as a whole. The differences in dependency of the countries of the region on this range of products is striking. It is closely correlated with the level of economic development, although with some notable exceptions, particularly among the Pacific islands.

Within the broad category of tropical products, the shares of different commodities vary strikingly. Afghanistan and the Islamic Republic of Iran almost exclusively export fruit and nuts, Bangladesh, jute and hard fibres. For over 90 per cent of its tropical goods exports (and over 60 per cent of total merchandise exports) Myanmar depends on fruit, nuts and forestry products. For unprocessed goods in these product groups, and in rubber, the Uruguay Round agreement will do little to expand exports. Access is not significantly limited by tariffs or NTBs in the developed countries where most exports go. (Fifty-three per cent of non-fuel primary exports of the developing countries of South and South-East Asia went to the developed market economies in the period 1989-1991).

D. TARIFF CHANGES UNDER THE URUGUAY ROUND

1. The Agreement on Agriculture

The principal features of the Agreement on Agriculture which covers all agricultural tropical products, are well covered in other chapters. All tariffs on agricultural goods are to be reduced by an average 36 per cent with a minimum reduction of 15 per cent for each tariff line over six years, or by 24 per cent over 10 years for developing countries. The new tariffs are also now all bound.

The agreed reductions in tariffs affect all the tropical agricultural products covered in this report. The rest of the agreement, in particular reductions in subsidies to domestic producers and to exports, are only of direct significance to tropical products in respect of rice and tobacco, though there will be important indirect effects on world market prices for tropical oilseeds, vegetable oils and cassava.

Table 1. Tropical product exports of the ESCAP region, shares in total exports and total exports, shares in total merchandise exports, average 1990-1992

(Millions of US dollars)

averages 1990-1992	Fruit, nuts (a)	Trop. beverages	Spices	Tobacco	Trop. veg. oils	Rubber	Jute, hard fibres	Forestry	Total tropical	Total exports
					(percentage)				(percentage)	(billions of US dollars)
Afghanistan	27.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	27.4	244
Bangladesh	0.3	2.5	0.0	0.2	0.0	0.0	24.1	0.0	27.1	1,711
India	2.5	4.1	2.5	0.9	0.4	0.0	0.9	0.1	11.5	18,612
Iran, Islamic Republic of	2.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	2.4	18,127
Maldives	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54
Pakistan	1.0	0.3	0.3	0.1	0.0	0.0	0.0	0.0	1.7	6,051
Sri Lanka	3.1	21.2	1.8	0.9	0.0	3.1	1.3	0.0	31.4	2,051
Brunei Darussalam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2,300
Cambodia	0.0	0.0	0.0	0.0	0.1	46.7	2.6	25.7	75.1	32
Indonesia	0.9	2.6	0.5	0.5	1.8	3.2	0.0	8.0	17.6	29,595
Korea, Republic of	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	1.0	71,172
Lao Peoples Democratic Republic	0.0	7.0	1.0	0.0	0.0	0.0	0.0	11.3	19.3	125
Malaysia	0.4	0.8	0.1	0.1	5.5	2.5	0.0	5.3	14.6	39,650
Myanmar	18.1	1.2	1.2	0.0	0.0	1.0	0.1	44.1	65.8	448
Philippines	5.3	0.3	0.0	0.6	4.3	0.1	0.0	0.8	11.3	8,949
Singapore	0.4	0.8	0.2	0.9	0.6	0.0	0.0	0.8	3.7	58,353
Thailand	6.1	0.2	0.1	0.4	0.0	3.6	0.2	0.3	10.9	28,103
China	2.7	0.7	0.1	0.4	0.2	0.0	0.1	0.3	4.5	72,298
Korea, DPR	1.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	1.8	1,532
Mongolia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	417
Viet Nam	1.5	5.7	1.0	0.0	0.0	2.3	0.1	2.3	13.0	2,275
Fiji	0.5	0.5	0.4	0.0	0.8	0.0	0.0	4.1	6.3	560
Papua New Guinea	0.0	9.1	0.1	0.0	4.8	0.1	0.0	5.3	19.5	1,434
Solomon Islands	0.0	5.3	0.0	0.0	10.8	0.0	0.0	28.0	44.2	83
Tonga	59.3	13.5	13.6	0.0	2.3	0.0	0.0	0.0	88.7	15
Vanuatu	0.1	10.5	0.0	0.0	0.0	0.0	0.0	3.4	13.9	20
Total	1.7	1.0	0.3	0.4	1.0	0.9	0.2	1.6	16.7	364,211

Sources: Food and Agricultural Organization of United Nations (FAO) SOFA'93 databank (Rome, 1993), United Nations Conference on Trade and Development *Commodity Yearbook 1994* (Geneva, 1994).

Note: (a) includes vegetables and non-tropical fruits.

2. Changes in nominal rates

Tables 2 and 3 show how the structure of MFN tariffs on tropical products has changed. They are based on imports from the developing countries as a whole, not specifically on those from the ESCAP region. Moreover table 2, which gives the distribution of imports by tariff range, is based on MFN tariffs, whereas many imports from the developing countries enter the developed countries at preferential rates.

Table 2. Pre- and post-Uruguay Round MFN duty coverage of tropical product imports by Quad countries
(Percentages of total imports)

import market	from all sources		from developing countries									
	duty-free		duty-free		duty≤10.0%		10.0-14.9%		15.0-19.9%		duty≥20.0%	
	Pre-UR	post-UR	pre-UR	post-UR	pre-UR	post-UR	pre-UR	post-UR	pre-UR	post-UR	pre-UR	post-UR
agric. products												
Canada	68	74	84	87	7	2	5	2	2	0	0	0
Europe Union	12	50	10	54	42	33	9	3	3	19	31	11
Japan	39	41	51	52	36	30	2	1	3	7	31	22
United States	58	73	62	77	5	4	2	3	3	0	0	0
non-agric.												
Canada	12	13	41	44	45	3	22	1	20	3	3	0
European Union	35	57	57	68	12	0	12	0	0	0	0	0
Japan	62	78	60	73	24	4	7	4	12	0	5	0
United States	18	53	31	71	2	0	1	0	1	0	0	0

Source: United Nations Conference on Trade and Development (1994).

Table 2 shows that the Uruguay Round has increased the tariff-free shares of developing country exports to the Quad countries, Canada, the European Union, the United States and Japan, from 10 to 54 per cent in the case of the European Union tropical agricultural products and by lesser amounts in the cases of the others. There is also a reduction in the coverage of the highest tariff rates. But while the shares of European Union and Japanese imports covered by the highest tariffs, over 20 per cent, are significantly reduced, for the shares covered by tariffs over 15 per cent have less substantial reductions. In the case of the European Union, MFN tariffs of over 20 per cent would apply to 31 per cent of agricultural imports before the Uruguay Round and 11 per cent after. For tariffs of over 15 per cent the reduction is from 34 to 30 per cent.

Table 3. Pre- and post-Uruguay Round MFN trade-weighted tariff averages of Quad countries
(Percentages of total imports)

	From all sources			From developing countries					
	MFN[a] tariff averages			MFN tariff averages			MFN or GSP[b] tariff averages		
	pre-UR	post-UR	reduction percentage	pre-UR	post-UR	reduction percentage	pre-UR	post-UR	reduction percentage
agric. products									
Canada	2.2	1.2	43.5	1.2	0.6	45.5	0.6	0.3	47.7
European Union	17.8	10.5	41.0	17.4	10.0	42.6	15.2	9.4	37.9
Japan	16.1	11.2	30.6	17.4	10.9	37.4	9.9	8.4	15.6
United States	2.4	1.4	40.0	2.1	1.2	41.1	1.5	0.8	42.8
non-agric.									
Canada	10.1	5.9	41.4	7.2	3.6	50.1	4.7	3.5	25.5
European Union	4.0	1.9	52.3	3.0	1.5	48.6	0.0	0.0	–
Japan	3.8	1.6	59.1	4.5	1.9	57.1	3.0	1.5	48.7
United States	3.4	1.9	46.3	3.2	1.4	55.4	0.9	0.7	17.9

Source: United Nations Conference on Trade and Development (1994).

Notes: a. Most favoured nation b. generalized system of preferences

Trade-weighted MFN tariff averages are given in table 3. For the agricultural group MFN reductions for imports from all sources range from 30.6 per cent in the European Union to 46.3 per cent in the United States. In absolute terms rates remain much higher for European Union and Japanese imports than for Canadian or United States imports. There is no significant difference between average rates using all imports as weights from those just using imports from the developing countries. Differences between average rates charged by different Quad countries are less marked for the non-agricultural group.

The table also tries to deal with the broadest of the preferential schemes, GSP. Taking the MFN or GSP rates, whichever is the lowest applicable to imports from the developing countries, except for Japan, the percentage tariff reductions for the agricultural group are not greatly different from those calculated using averages of MFN rates alone. In the case of Japan they are less than half as much. The weighted average tariff post-Uruguay Round is still nearly 10 per cent for the European Union, with the GSP benefits significantly cut back. Previously the GSP potentially

gave an average preference margin of 2.2 per cent which is reduced to 0.6 per cent. The loss in the average preferential margin of the Japanese scheme is from 6.5 to 2.5 per cent. For the non-agricultural group the tariff reductions are considerably attenuated by the GSP for Canada and the United States, and somewhat less so for Japan, while the GSP margins are reduced for the agricultural group. In the case of European Union imports, the lowest rates were already zero before the Round.

To sum up, for tropical exports as a whole, the tariff barriers of the largest developed country importers have been significantly cut, particularly at the peaks, but when GSP preferences are taken into account these reductions are significantly eroded. The preference margins themselves are also eroded, particularly where they were greatest, that is for tropical agricultural products going to the European Union and Japanese markets. Of course, this analysis ignores the effects of the Uruguay Round on the GSP schemes themselves. At least one, the EC scheme, is likely to undergo significant systemic changes which will restore some of the lost margins, but only for the poorest exporters.[1]

3. Estimating the effects of liberalization

The methodology used in this Chapter is, what may be termed, eclectic. Ideally a highly-disaggregated model is needed to assess the effects of the improvements in market access on the developing countries, and on particular countries and groups. It would take into account the various trade preferences enjoyed by certain groups of countries on certain industrialized markets. It would adjust for interdependencies in demand for and in the supply of different commodities. It would permit the dynamic effects of trade changes on growth and investment to be quantified and assessed. No such model exists. However, in conjunction with the Organization for Economic Co-operation and Development (OECD) Development Centre, Page and Davenport (1994) were able to use the general equilibrium RUNS (Rural-Urban, North-South) model to simulate the effects of the Uruguay Round agreement.

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[1] The European Union Commission has proposed to the Council of Ministers a fundamental revision of the GSP, under which volume restrictions on eligibility such as tariff quotas or ceilings would be eliminated. Instead tariff 'modulation' would be introduced. This would divide GSP-covered goods into those sensitive products to which a preferential duty of 80 per cent of the MFN is applied, semi-sensitive products with 40 per cent of the MFN tariff and fully exempt goods. There is also likely to be increased use of graduation of the better-off beneficiaries although the criteria (if any) have yet to be announced.

Unfortunately, the model cannot be used for all tropical products. As the authors accept (Goldin and other, 1993), although they use it and quote its results for all trade, it is primarily designed for temperate agricultural goods. Among the products treated here, only tropical beverages and vegetable oils are specified (and even then the vegetable oils sector includes temperate oils not included in the Uruguay Round tropical products set). The RUNS model classifies the developing economies into a number of groups which those in the ESCAP region divided among South Asia[2] and Other Asia[3]. Indonesia and India are treated separately.

The OECD model has no provisions for differential tariffs and thus cannot cope with trade preferences. In order to assess trade diversion between different groups of developing countries and between the developing countries and the Western industrialized countries, partial equilibrium calculations with all their limitations – lack of demand and supply interdependencies and no feedback through factor markets – were used where the RUNS model was inadequate. Partial equilibrium analysis estimates the direct effect of a change in one or more tariff rates on imports from alternative sources on the basis of assumptions about the elasticities of supply and demand.

For coffee and cocoa and vegetable oils, partial equilibrium analysis was used to estimate trade diversion between the ACP and other developing countries as a second stage although the basic results for the changes in production, trade and world prices were taken from the RUNS model[4]. In these cases changes in net exports corresponding to the RUNS geographical classification were estimated, whereas for the other product groups the only distinction was between ACP and other developing country suppliers. Otherwise, Partial equilibrium analysis was used independently for all products where the Uruguay Round produced significant tariff changes for developing country exports, i.e., tobacco and spices. In both these cases substitution effects would a priori seem likely to be small. For the changes in the world price of cassava (fresh, dried or starch) the RUNS estimate of

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2 Afghanistan, Bangladesh,Bhutan, India, Kampuchea, Democratics People's Republic of Korea, Lao Democratic Republic, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Sri Lanka, and Viet Nam.

3 Brunei Darussalam, China PRC, Fiji, French Polynesia, Hong Kong, Indonesia, Republic of Korea, Macao, Malaysia, New Caledonia, New Hebrides, Papua New Guinea, Philippines, Singapore, Taiwan Province of China, Thailand, and Tonga.

4 In the case of vegetable oils, it did not seem that the difference in definition would distort the estimated relative changes in production, trade and prices for the countries in the ESCAP region unduly.

the rise in the price of coarse grains was used. No estimates were made for changes in the trade flows of live plants and cut flowers, tropical fruits and nuts, tropical woods and rubber. In these cases, either the pre-Uruguay Round tariffs were generally zero or low with zero GSP rates (woods and rubber) or ESCAP exports were small to those markets where rates were significant (flowers to the European Union)[5]. It is true that for certain processed wood and rubber products included among tropical products, tariffs were and remain substantial. However, the problem of tariff escalation is dealt with separately below.

This methodology cannot yield demonstrably consistent results. Taking only one good at a time, the Partial equilibrium models follow trade theory and common sense in predicting positive price effects for exports of tropical and industrial products from the reduction in trade barriers but falls in previously protected markets. However, since the Uruguay Round reached an agreement on reductions in trade barriers over a broad range of goods and services, clearly negative price changes could arise from substitution and income effects where liberalization removed (relatively) small barriers or where they were non-existent (most primary products) and which are not specifically modelled[6]. In addition, the partial equilibrium approach cannot deal with trade reversals or new export sectors which liberalization might generate. Nevertheless, our method should at least identify the principal effects of the market access negotiations, and the main thrust of their differential implications for different groups of developing countries.

The most important MFN and GSP average tariff rate changes on tropical products in the Quad countries are shown in table 4. Some of these are based on specific tariffs converted to percentage rates using average values for 1992.

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5 In the case of tropical fruits and nuts, the European Union maintains a significant tariff only on pineapples. There is no GSP regime. However, the only ESCAP exporter of any significance is Thailand with only ECU 769,000 on average in 1990-1992. The MFN tariff will be reduced from 9 to 5.8 per cent so Thailand will gain marginally. In the case of Japan a high MFN tariff is maintained against bananas. The Philippines is a major exporter ($ 334 million on average in 1990-1992) but will not benefit fully from the halving of the MFN tariff from (on average) 45 to 22.5 per cent, since the GSP rate is already below that level. To what extent banana imports benefit from the GSP regime is not known, but there could be some gains here for the Philippines.

6 Substitution effects arise where consumers switch between goods in response to changes in relative prices, thereby bringing about second-order price changes. Income effects result from changes in real incomes effected by the initial changes in prices. Where incomes are reduced because of first-order price increases, consumers may buy less of other goods and bring about reductions in their prices.

The various GSP schemes are jealously guarded as autonomous concessions by the donor countries. The rates were not negotiated during the Uruguay Round nor can one presume that there will be any general pattern of adjustment of the GSP rates following cuts in the MFN rates. The GSP averages given in table 4 are based on pre-Uruguay Round GSP rates or post-Uruguay Round MFN rates, whichever is the lower.

The preferential tariff rates and GSP utilization rates are important in estimating trade diversion from the ACP States to the other developing countries and from both these groups to the MFN suppliers. They are also needed for calculating the changes in world prices and the after-tariff prices received by the different exporter groups on different markets. But for individual schemes the share of the imports which enter at GSP rates is not readily available on a detailed product by product basis. In the case of coffee and cocoa, where trade is generally undertaken by large multinationals and the products are fairly homogeneous, GSP utilizations of 95 per cent are assumed. In the other categories, spices, tobacco and oils, GSP coverage is much sparser. On the basis of United Nations Conference on Trade and Development (UNCTAD) GSP data, utilization rates of 3, 5 and 22 per cent are assumed[7].

A few remarks on the table are useful. Most Western industrialized countries allow tariff-free imports of tropical beverage crops – at least in their unprocessed state – but the European Union has until now maintained tariffs on coffee and cocoa beans, though not on tea, to protect the preference margin of the ACP States. The Mid-Term offer (1988) reduced the MFN tariffs on coffee beans from 5.0 to 3.0 per cent and eliminated the GSP rate which had been at 4.5 per cent. These changes were implemented in 1991. The rate on cocoa beans was already 3.0 per cent. The final offers bring the European Union rates on coffee and cocoa beans down to zero.

Most developed countries admit most spices tariff-free or at very low rates. Only the European Union and Japan retain significant rates, but in the case of Japan, post-Uruguay Round MFN rates are still above existing GSP rates – which in any event are quite low (averaging some 1.3 per cent). With no information on the utilization rate in Japan and with limited imports from the ESCAP region, the effects of the Uruguay Round on imports of spices by Japan was ignored.

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7 The utilization rate measures the share of total exports of a particular product group which benefit from the GSP. This will be affected by the share of non-dutiable products, by the share of GSP-covered exports in dutiable products and by the 'take up' rate on covered exports, itself determined by such factors as transactions costs, ignorance about the schemes and rules of origin.

On tobacco and vegetable oils, the European Union again maintains higher MFN tariffs than most OECD countries, again partly to sustain the preference margins of the ACP but also in part because these are important CAP products. Indeed the only reason that they are not subject to the usual variable levies on CAP products is the prior binding of their tariff rates.

Table 4. Average pre- and post-Uruguay Round tariff rates on major tropical products, and resulting changes in trade
(Percentage[a])

	coffee beans	cocoa beans	spices	tobacco	vegetable oils
European Union:					
MFN pre-Uruguay Round	5.0	3.0	10.6	22.5	8.0
MFN post-Uruguay Round	0.0	0.0	2.7	17.8	5.1
GSP pre-Uruguay Round	4.5	–	3.2	22.2	2.5
GSP post-Uruguay Round	0.0	–	1.4	17.8	2.5
other OECD:					
MFN pre-Uruguay Round	0.0	0.0	4.0	10.0	4.0
MFN post-Uruguay Round	0.0	0.0	1.8	5.0	2.5
GSP pre-Uruguay Round	–	–	1.3	0.0	1.0
GSP post-Uruguay Round	–	–	1.3	0.0	1.0
change in world price %	-1.5	-1.2	0.2	1.9	0.9
change in ACP exports (c) %	-1.5	-0.5	-0.4	-2.8	-1.1
change in other dev'g exports (c) %	0.7	1.7	0.1	0.5	0.1

Sources: For tariffs, various offers to the General Agreement on Tariffs and Trade (GATT); for trade effects, see text and also Page and Davenport (1994).

Notes:

a: unweighted averages
b: no changes in actual rates assumed; see text
c: as a percentage of exports to European Union.

In the case of cassava the exports of the ESCAP region will be affected by the changes in world and European Union prices of coarse grains brought mainly about by the reductions in protection in the developed countries. The European Union maintains prohibitive tariffs on cassava and, in particular, the derived starch which, in the European Union, is used as a substitute for coarse grains in animal feeds. Little is imported into the European Union at these rates. However, the European Union extends a tariff quota for fresh or dried cassava to Thailand and another to other GATT members of which 85 per cent is reserved for Indonesia. A 6 per cent duty is charged on imports within these tariff quotas. Thus, the MFN tariff reductions in the European Union offer have little practical value. (One of the failings of the Uruguay Round is that in-quota tariffs do not have to be reduced as long as the current and minimum access provisions are met. As long as imports account for at least 5 per cent of consumption only tariffication, where it is necessary, and subsequent MFN tariff reductions are required.)

No increases in the volumes of European Union imports can be expected. However, the European Union import price of cassava should fall with the reform of the CAP while the world price of the coarse grains rises. The RUNS simulation gave an increase in the price of coarse grains of 1.9 per cent, and I have taken that as the rise in the world cassava price. Taking that into account the European Union price could fall around 20 per cent[8].

Table 4 summarizes the results on tropical beverages, spices, tobacco and vegetable oils. They suggest that the Uruguay Round agreement will on balance not have a major effect on the ESCAP region. The value of ACP exports of coffee beans to the European Union decline some 3 per cent, in the case of tobacco they decline 2.8 per cent in volume but only 0.9 per cent in value. Otherwise the effects are even smaller.

Only in Thailand are the effects likely to sum to more than 0.5 per cent of total exports – and that is because of the likely fall in the price of cassava on the European Union market.

These numbers ignore the effects of the liberalization of imports of spices and tobacco by the developing countries, including the ESCAP region itself. The region is a net exporter of these products and, in particular,

8 The tariff equivalent in the base period is taken as 145 per cent (the actual value for rye, oats and barley – that for maize was 147 per cent) and the internal European Union price as 236 ecu/tonne.

India and Indonesia would benefit, adding perhaps half as much again to the gains registered for these products (on the basis that about half of their exports are directed to other developing countries, but the extent of import liberalization in these is less than that in the developed world).

A number of ESCAP countries are not GATT or WTO members. Some of them, in particular a number of the Pacific islands, already have observer-status at GATT and may join WTO by the end of July and thus qualify immediately for MFN tariff rates. Otherwise their applications will have to undergo the standard lengthy examination procedure. It is less likely that China, even if it secures admission to the WTO in the near future, will be allowed full market access at MFN rates since it is classified as a state-trading nation.

While these results are relatively modest, they ignore two important factors: the effects of the agreement on tariff escalation and the so-called dynamic effects of trade barrier reductions.

E. CHANGES IN TARIFF ESCALATION

One path to increasing the value added of exports may be through the processing of domestic primary products. In table 5 growth rates of exports of jute, rubber, wood and tobacco at different stages of processing are shown for the period since 1988 for some of the major exporting countries.

The picture given in the table is mixed. In jute total exports have declined, but more so among processed products than in the raw fibre. However, both India and Sri Lanka have actually increased their exports of the processed products. Exports of semi-manufactures of rubber have expanded particularly rapidly while raw rubber exports have declined. Indonesia and Malaysia in particular have succeeded in raising the value added content of their exports. In tobacco manufactured exports have increased faster than those of the raw material thanks in large part to the success of the Philippines.

In those three product categories any success in moving up the processing chain has had to overcome considerable tariff escalation (see table 6). In the case of wood, tariff escalation is less clear – it depends on the stage of processing. The reduction in exports of wood in the rough and expansion of exports of panels (veneers, plywood, board, etc.) is in spite of the considerable tariff escalation, but the much greater expansion of exports of semi-manufactures has been assisted by the tariff structure.

Table 5. Growth rates of exports to European Union of unprocessed and processed products, selected products, selected countries, 1988-1993

(Percentage)

	jute			rubber			
	fibres	yarns and fabrics	total	raw	semi-processed	articles	total
Pakistan	..	..	..	..	..	28.6	27.0
India	42.0	15.3	38.7	-8.1	15.8	29.3	26.4
Bangladesh	-24.5	..	-25.9	..	..	..	..
Sri Lanka	..	28.8	16.4	1.0	68.1	21.1	9.4
Thailand	-21.4	-53.4	-38.5	10.9	-13.2	31.6	18.4
Indonesia	..	..	..	-7.7	136.1	35.4	-4.4
Malaysia	..	..	..	-18.6	53.7	32.2	-5.8
Philippines	99.3	..	99.3	..	-54.8	34.2	25.2
total	-22.0	-52.1	-23.3	-11.3	49.8	31.5	-0.7

	tobacco			wood				
	unmanuf'd	manuf'd	total	rough	panels	semi-processed	articles	total
Pakistan	33.6	-15.9	33.0	..	8.2	..	20.2	0.9
India	11.0	6.7	11.0	-6.5	-6.8	53.9	16.5	0.9
Bangladesh	26.1	..	26.1	-38.3	..	..	2.2	1.1
Sri Lanka	174.9	..	175.0	-20.8	22.7	..	62.0	0.9
Thailand	11.5	-49.2	11.5	-37.9	-10.2	27.1	28.8	0.8
Indonesia	-1.8	2.9	-1.8	-19.9	9.1	111.7	65.2	0.9
Malaysia	..	..	101.5	11.0	-2.0	64.2	30.7	0.9
Philippines	4.4	26.7	5.4	-46.4	-18.3	2.9	5.0	1.3
total	10.4	12.7	10.5	-2.1	4.5	57.3	35.8	0.9

Notes: .. indicates that growth rate cannot be calculated because there were no exports in base year.

Not too much should be read into these rather crude data, but there can be no doubt that reductions in escalation can only be helpful in shifting to greater processing and raising the value added content of exports. In this respect the Uruguay Round agreement is relatively promising. GATT (1994) presents a table, in part reproduced as table 6, showing changes in escalation for selected product categories, some of which feature in our list of tropical products. Of the thirteen product categories considered, tariffs both before and after the Round increase with processing, in all except wood and paper. Of the eleven products which display tariff escalation, the Uruguay Round will definitely reduce that escalation in five including tobacco. For all industrial tropical products considered together, the same report concludes that escalation as measured by the absolute difference

between the tariffs applied to the processed and unprocessed products, is significantly reduced. Although it remains significant at the first stage of manufacturing, it is eliminated between the semi-manufactures and finished products stages. How important this is in reducing the disincentive to the export of higher value-added products – that is reducing the effective rate of protection – would require further examination. At least it is a step in the right direction.

Table 6. Changes in tariff escalation in selected product categories

Product category by stage of processing	Weighted average		Change in tariff escalation
	Pre-Uruguay	Post-Uruguay	
Rubber			
raw	0.1	0.0	–
semi-manufactures	5.5	3.3	-39
finished products	5.1	3.6	-28
total	3.4	2.3	–
Wood			
in the rough	0.0	0.0	–
panels	9.4	6.5	-30
semi-manufactures	0.9	0.4	-50
articles	4.7	1.6	-67
total	2.0	1.1	–
Jute			
fibres	0.0	0.0	–
yarns	5.4	0.1	-98
fabrics	5.7	3.2	-43
total	5.1	1.8	–
Tobacco			
unmanufactured	14.7	11.5	–
manufactured	22.1	9.2	-131
total	17.3	10.7	–
All tropical industrial products			
raw materials	0.1	0.0	–
semi-manufacures	6.3	3.5	-100
finished products	4.2	1.9	-19
total	4.2	1.9	–

Source: General Agreement on Tariffs and Trade (1994).

Notes:

(i) Tariff escalation is defined as the wedge between the processed and the unprocessed or raw product. The percentage change in tariff escalation is calculated.as the decline in the tariff wedge divided by the original wedge.

(ii) A desh ‒ indicates that the item is not applicable.

As regards tropical agriculture, the picture is more mixed, and a more thorough analysis is needed. At first sight it appears that escalation is reduced in spices in the European Union and United States, in oilseeds and oils in the four Quad countries, but generally increased in tropical fruits. In tropical nuts it is increased in Japan but reduced in the European Union and United States (UNCTAD 1994).

However, these remarks ignore the GSP and Lomé preferences. The limited progress that many developing countries, including the ACP States, have made in moving downstream is doubly unfortunate to the extent that their tariff preferences through the GSP and through Lomé on the European Union market have generally been greater the higher the level of processing, and that this advantage of being exempt from tariff escalation will now be eroded. Most GSP schemes, leather, wood and tobacco being exceptions, allow zero-tariff entry for goods at different stages of processing, in which case tariff escalation is only a problem where the GSP is not utilized. With utilization rates at about 50 per cent, escalation may still be a problem for the developing countries but a rather more complex one than the table of MFN rates suggests. In the two important cases of coffee and cocoa, the reduction of EC MFN tariffs on beans to zero will inevitably mean increased escalation.

F. POLICY IMPLICATIONS

1. This Chapter has not considered the liberalization of access to ESCAP markets required under the Uruguay Round agreement. However, reductions in the border protection of and subsidies to tropical product production will mean that several countries will face the problems of lack of competitiveness on not only export but also domestic markets. Clearly policy measures will be needed to address the twin goals of increasing productivity in the production of certain goods and diversifying into alternative export crops. A wide range of measures is called for including:

(a) The expansion of agricultural extension services, in particular in the fields of yield improvement, more cost-effective use of fertilizers and pesticides and of assistance in crop diversification;

(b) The development of agricultural banks and other credit facilities for the farm sector;

(c) Accelerated research into alternative products for both the domestic and export markets.

2. Raising the value added of tropical products exports of the ESCAP region. Increasing the proportion of processed goods exports requires investment in processing facilities and, often, the transfer of skills and technical processes from abroad. Clearly foreign direct investment (FDI) will often be a fast track to higher value added exports. The policies needed for increasing FDI are not particular to the tropical products sector. In general to attract increased flows of inward FDI some of the countries need:

(a) Improvements in the legal and regulatory conditions under which foreign companies operate: safeguards against expropriation, ease of access to foreign currencies, minimum of restrictions on repatriation of profits and so on;

(b) Elimination of certain trade-related investment measures (TRIMs) such as requirements on the use of domestic inputs or export share criteria. In some cases a more rapid phasing out of these than is foreseen under the Uruguay Round agreement is needed.

Another complex issue is the extent to which foreign companies should be induced to invest through special treatment, such as tax incentives, or whether the principle of equal treatment of foreign and domestic investors should prevail. It is important not to alienate the unsubsidized domestic private sector and, in particular, potential domestic investors. Secondly, tax incentives may contribute to a misallocation of investment as restrictions imposed by the host government or other market imperfections, lead to a bias in favour of particular sectors. Thirdly, through the erosion of the tax base, tax inducements can significantly reduce the economic benefits to the host economy from FDI and, where discount rates are high and planning horizons long, may make a relative small contribution to estimated rates of return.

Other measures that could encourage FDI would be:

(a) Further eliminating bureaucracy (for example, establishing a 'one-stop investment shop');
(b) Cutting restrictions on the direction or minimum level of FDI;
(c) Clarifying land ownership where that remains a problem.

Many of the same considerations apply to domestic investment.

Those countries embarking on privatization programmes could make special efforts to create a 'level playing field' for foreign participation

by simplifying tendering procedures and making special provisions to ease the problems of a non-convertible currency, without actually discriminating in favour of foreign capital.

3. Sectoral policies to raise the value added of tropical products exports:

(a) Government assistance, in forms acceptable under the Uruguay Round agreement, towards developing or expanding processing facilities for particular tropical products, has a role to play. This may take the form of the provision of infrastructure, selective depreciation allowances, etc. However, it is important that care is taken to avoid distortions in the pattern of economic development such that the sectors in question become dependent on the maintenance of subsidies;

(b) In general, the process of liberalization of trade within the ESCAP regions should be pursued. Countries must not succumb to temptations to subsidize or, in other ways, protect their agricultural sectors if agricultural incomes grow less rapidly than incomes in the urban sectors.

4. Continued improvement of access to western, particularly European Union, markets is a precondition for the successful adjustment of countries in the ESCAP region:

(a) The Western industrial countries should improve their GSP schemes by expanding coverage, increasing the preference margins where GSP rates are not already zero, eliminating or increasing tariff quotas and easing rules of origin. This has particular importance for processed tropical products. At least for non-sensitive goods, cumulation should be allowed between all the developing countries;

(b) These countries should also accelerate the reductions in tariffs, particularly on processed goods, and go beyond what is required under the Uruguay Round agreement. Where tariff quotas still exist (as cassava imports in the European Union) they should be steadily expanded.

(c) Certain developed countries continue to maintain, often substantial, excise taxes on tropical beverages, although most countries have or are phasing out tariff barriers. Such excise taxes in the European Union are due to be harmonized.

Considerable stimulus could be given to the consumption of tropical beverages by the phasing out of the excise taxes wherever they persist.

5. WTO membership: a number of countries in the ESCAP region are not presently members of GATT. Some of those have taken steps to apply for membership of the WTO, but others have not. Some of the latter, who also have a large state-trading sector, may be waiting for the resolution of the application of China, although Viet Nam has taken steps to join. Others, in particular some of the small Pacific island States, may simply be constrained by inertia rather than concern about the conditions that membership would impose.

In any event membership as soon as is feasible is desirable in order to secure the advantages of:

(a) MFN treatment. Although this may be restricted in the case of members in which state-trading is still a major component, at least MFN treatment across a significant share of exports can probably be negotiated;

(b) Acceptance of WTO disciplines. The distinction between developed and developing countries, and indeed the least developed, is now formally part of the Uruguay Round agreement and the market access requirements have been differentiated. The Uruguay Round requirements may serve as a valuable catalyst for liberalizing certain of the economies in the ESCAP region, lowering the prices of imported inputs and introducing competition for domestic producers. In some cases it may provide the necessary alibi for Governments to resist the demands for protection by local interest groups;

(c) Access to the WTO disputes procedure;

(d) Participation in future multilateral trade negotiations.

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III. IMPLICATIONS FOR THAI AGRICULTURE: COMPUTABLE GENERAL EQUILIBRIUM (CGE) CALCULATIONS AND BEYOND

by

Nipon Poapongsakorn
and
Peter Mytri Ungphakorn
Thailand Development Research Institute

Several attempts have been made by researchers around the world, using various models, to look at the income and welfare effects of the Uruguay Round agreements.[1] They generally conclude that most of the gains come from agricultural liberalization. Typical estimates suggest that developing countries will enjoy welfare gains of 23-37 per cent[2].

These models are highly instructive, but they also contain two weaknesses. Methodologically, they concentrate on end results and are, therefore, inadequate for looking at what happens in the shorter term period of implementation and adjustment. And they cannot take account of at least four features of the agreements and of world markets that could be important.

First, most models cannot capture some of the exceptions of the Uruguay Round. One example is direct income subsidy payments. These supposedly do not distort markets either because the payments are not related to quantities the farmers produce, or because farmers who receive the subsidies are prevented from over-producing by conditions requiring them to set aside some of their land. But the subsidies do keep farmers in business and strictly-speaking cannot be free from the accusation that they distort production decisions. Some distortions are also said to persist because farmers can choose to set aside land that is less fertile.

In Thailand's case, the potential major import markets have managed to exempt themselves from significant market opening. A number of market-access commitments involve tariff-quotas whose quota portions are allocated among existing suppliers, a practice that limits opportunities for newcomers – ruling out, for example, opportunities for Thailand to sell sugar to the United States.

Second, the models cannot generally take account of important details within the broad commitments. For developed countries, tariffs are supposed to fall by 36 per cent over six years (24 per cent in 10 years for developing countries). But these are only averages. Countries can select which tariffs they are willing to cut the most, and which they will leave relatively untouched.

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1 A summary survey of computable general equilibrium (CGE) assessments of the Uruguay Round appears in annex III (pages 59-62) of General Agreement on Tariffs and Trade, "The Results of the Uruguay Round of Multilateral Negotiations. Market Access for Goods and Services: Overview of the Results", (Geneva, November 1994).

2 GATT, "The Results of the Uruguay Round of Multilateral Negotiations. Market Access for Goods and Services: Overview of the Results", (Geneva, November 1994), and I. Goldin, O. Knudsen and D. van der Mensbrugghe, "Trade Liberalization: Global Economic Implications", (Paris, Organization for Economic Co-operation and Development and the World Bank, 1993).

Third, the models have not been able to take account of the apparently widespread use of "dirty tariffication". Countries are said to have generally overstated the extent of protection that they currently offer to agricultural products so that when this is replaced by tariffs or tariff-quotas, the calculated equivalent rates are unrealistically high. The final level of protection could actually be more severe than before tariffication.[3]

Fourth, most models cannot take account of the fact that different tastes and different crop varieties prevent similar products from different countries being perfect substitutes for each other. Some calculations have tried to take account of this, however, such as those in the GATT publication, "The Results of the Uruguay Round of Multilateral Negotiations"[4]

This chapter attempts to assess the possibility that it is Thailand's unilateral liberalization in industrial goods that could, over the coming years, be more beneficial for the agricultural sector than the results of the multilateral Uruguay Round agreements on agriculture as such. Moreover, among agricultural liberalization measures worldwide, the reduction of Thailand's own protectionist policies for some import-substitution activities (such as soybean and maize cultivation) could be the most beneficial for Thai agriculture as a whole.

A. THE AGRICULTURE AGREEMENTS AND THEIR GENERAL IMPACT

The history of agriculture in the world trading system is well documented.[5] A host of exemptions and waivers left the sector largely outside the General Agreement on Tariffs and Trade (GATT) framework.

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3 See Ingco, M. "Agricultural Trade Liberalization in the Uruguay Round: One Step Forward, One Step Back?" (Washington, D.C., the World Bank, September 1994). One analyst has defined dirty tariffication as the phenomenon by which the committed bound rate for the post-Uruguay Round period is higher than the estimated tariff equivalent for the base years. The rules for calculating post-Uruguay Round tariffs were laid out in low-level negotiating documents, not in the agreement itself. Dirty tariffication is not illegal; it is merely a gap between actuality and the rhetoric of the Round.

4 GATT, op. cit.

5 See, for example: Winham, *International Trade and the Tokyo Round Negotiations* (Princeton, Princeton University Press, 1986), pp.147-158; Fitchett, "Agriculture" in *The Uruguay Round: A Handbook on the Multilateral Trade Negotiations*; Finger and Olechowski, eds., (Washington, D.C., the World Bank, 1987), pp.162-170; G. Millar, *The Political Economy of International Agricultural Policy Reform* (Canberra, Australian Government Publishing Service, 1987); and P. Evans and J. Walsh, *The EIU Guide to the New GATT* (London, Economist Intelligence Unit, 1994).

Attempts to bring agriculture into the GATT disciplines met with only limited success in the Kennedy and Tokyo rounds. By comparison, the Uruguay Round agreements are a major breakthrough. For the first time, the world's trading nations have agreed to tackle four major contentious areas: protection against imports ("border measures"), domestic support, export subsidies, and sanitary-phytosanitary (animal and plant health) regulations.

1. Discipline and stability

The most radical reform is tariffication – the replacement of import quantity restrictions, such as quotas and bans, by tariffs or tariff-quotas (multiple tariff rates combined with quotas). The Uruguay Round's tariffication is radical because it covers all agricultural products. There are no longer going to be absolute limits on import quantities; and even though the out-of-quota tariff rates are often absurdly high, participants are committed to reducing the rates, with further negotiations promised. Moreover, the in-quota and out-of-quota tariffs are bound. Virtually the entire agricultural sector's tariffs are coming under the disciplines of GATT bindings, while eight rounds of negotiations have failed to achieve the same for industrial products – an estimated 83 per cent of industrial product tariff lines are bound.

What that means is that the most important achievement of the Uruguay Round negotiations on agriculture is the imposition of a set of principles and disciplines. How these principles impact on the income and welfare of developing countries of the Asia-Pacific region is more complicated. For the time being, the overall level of protection of agricultural products in most developed countries will remain higher than for industrial products.

The implications can be put into perspective by looking at particular cases. It could be argued that for Thailand and a number of other countries, the most damaging action in agriculture has not been border protection, but the dumping of low-priced subsidized surpluses on third markets. Thailand helped set up the Cairns Group in 1986 because it was alarmed that world rice prices were being depressed by credit and deficiency payments subsidized by the United States of America. These two programmes do not come under the Uruguay Round's "export subsidy" disciplines at all. Deficiency payments are placed firmly in the "green box" of permitted domestic supports. In fact, the Thai agricultural sector appears set to gain most, not from any changes in agriculture, but from Thailand's own tariff reductions on industrial goods. It is important to note that these tariff reductions are not part of

the schedule of commitments under the Uruguay Round agreements, but rather they are part of unilateral reforms introduced earlier this year.

Nevertheless, the Uruguay Round's agriculture agreements are significant for a number of reasons:

> Overall, the results of the negotiations provide a framework for the long-term reform of agricultural trade and domestic policies over the years to come. It makes a decisive move towards the objective of increased market orientation in agricultural trade. The rules governing agricultural trade are strengthened, which will lead to improved predictability and stability for importing and exporting countries alike.
>
> The agricultural package also addresses many other issues of vital economic and political importance to many members. These include provisions that encourage the use of less trade-distorting domestic support policies to maintain the rural economy, that allow actions to be taken to ease any adjustment burden, and also the introduction of tightly prescribed provisions that allow some flexibility in the implementation of commitments.[6]

The flexibility extends to tariffication. Initially the tariffs on tariff-quotas are to provide the same level of protection as the quantitative restrictions they replace.[7] These tariffs, like existing tariffs on agricultural products are to be reduced over six years by an unweighted average of 36 per cent in the case of developed countries, and by 24 per cent over 10 years for developing countries. Since developed countries account for two thirds of world imports of agricultural products, their across-the-board tariff reductions will have a significant impact on future trade in these products. Table 1 summarizes the tariff reductions of the developed countries. It shows that tax cuts range from a low (simple average) of 26 per cent for dairy products to a high of 48 per cent for flowers.

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6 GATT, "The Final Act of the Uruguay Round" *News of the Uruguay Round* NUR 084 (Geneva, 5 April 1994).

7 Some countries are allowed to delay tariffication for a few years, but on stringent conditions. Moreover, developing countries are exempt from tariffication commitments on "a primary agricultural product that is the predominant staple in the traditional diet", provided they meet other requirements such as minimal access opportunities for imports of the staple, rising from 1 to 4 per cent of domestic consumption over 10 years; the application of effective production-limiting measures; and commitment to significant market access for other products. (Annex 5 Paragraph 7 of the Agreement on Agriculture.)

Table 1. Developed country imports and tariff reductions on agricultural products
(Millions of US dollars and percentage)

Product categories	Value of imports		Percentage reduction in tariffs
	All sources	Developing economies	
All agricultural products	84,240	380,030	37
Coffee, tea, cocoa, mate	9,136	8,116	35
Fruits and vegetables	14,575	8,887	36
Oilseeds, fats and oils	12,584	6,833	40
Other agricultural products	15,585	4,233	48
Animals and products	9,596	2,690	32
Beverages and spirits	6,608	2,012	38
Flowers, plants, vegetable materials	1,945	1,187	48
Tobacco	3,086	1,135	36
Spices and cereal preparations	2,767	1,134	35
Sugar	1,730	1,030	30
Grains	5,310	725	39
Dairy products	1,317	48	26

Source: General Agreement on Tariffs and Trade, 1994.

While the overall level of protection of agricultural products in most developed countries will remain much higher than that of industrial products, the level of security for trade in agricultural products will be greater than for trade in industrial products since virtually 100 per cent of agricultural product lines will be bound. The figure for industrial products is 83 per cent. In addition, there will be no quantitative restrictions on agricultural products. Moreover, a much larger proportion of agricultural imports than industrial imports already benefit from bound duty-free treatment. In the case of tariff lines that were not bound duty free, all of them were reduced and bound by the developed countries and the transitional economies. The developing countries also agreed to bind 15 per cent of tariff lines at ceiling rates (Table 2).

In principle, tariffication should at least retain existing market access ("current access").[8] In addition, in the case of products for which little or no imports took place, a minimal opportunity for market access is to be committed immediately at 3 per cent of consumption, rising to 5 per cent after six years. The idea of "minimum access opportunity" is notional; it may not always apply in practice. The commitments take the form of tariff-quotas whose in-quota rates are lower than the tariffs charged on out-of-quota quantities. But even the in-quota tariffs can be high enough to obstruct imports. Examples of increased market access are given in Table 2.

Domestic support measures with no or minimal impact on trade, namely, the "green box" of permitted policies, are exempt from budgetary reductions. Programmes for research, disease control, infrastructure and food security stocks can continue. So more importantly, can income support paid to farmers that is "decoupled" from production, including United States deficiency payments, and the new European Union compensation payments introduced under the reformed Common Agricultural Policy. The inclusion of these two programmes in the "green box" is the result of the November 1992 bilateral agreement between the United States and European Union (at that time European Community) known as the Blair House Accord. The justification for permitting these programmes is that they are said to have no effect on production since farmers are also required to limit production under land set-aside conditions. For developing countries, additional domestic support is permitted for rural development programmes, input subsidies and crop or livestock diversification. These exceptions will allow both developed and developing countries to continue with a high level of subsidy, although direct price support is now limited.

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8 Various summaries of the Uruguay Round agreements describe how tariffication should be calculated, the targets for tariff reductions, and what amount of minimum market access should granted. In fact only some of these are committed specifically in the *Final Act*. Annex 5 of the *Act*'s Agreement on Agriculture essentially allows Japan and the Republic of Korea to limit rice imports. Under the description of a "non-trade concern" (presumably food security and rural culture), Japan is allowed to set minimum access opportunities of 4 per cent of base-period consumption rising to 8 per cent after six years. The Republic of Korea, as a "developing country" is allowed to grant 1 per cent minimum access rising to 2 per cent after six years, and 4 per cent after 10 years, on the basis that rice is a "staple" and on condition that the Republic of Korea provides for other products. The remaining commitments – including the minimum access of 3 per cent rising to 5 per cent in general, and the target of cutting tariffs by 36 per cent (24 per cent for developing countries) – are non-binding. They were originally in annexes in the 1991 "Dunkel Text" version of the *Draft Final Act*, but were relegated to separate documents later.

Table 2. Increases in market access under minimum access opportunity commitments: selected products
(thousands of metric tonnes)

Product	Increase in access opportunities between period base and end of implementation period	
	Total	Selected sub-categories
Coarse grains	1,757	Maize (1,065); barley (552)
Rice	1,076	
Wheat	807	
Diary products	729	Milk and cream (305); milk powder (147); cheese (132); whey powder (83)
Meat	421	Bovine meat (186); pigmeat (133); poultry (94)
Vegetables	355	Potatoes (197); onions, garlic (39); cabbages (32)
Sugar	292	
Eggs	252	
Fruits	130	Citrus (64); apples, pears, peaches, plums, cherries (28); bananas (13)
Oilcakes and oilseeds	126	
Vegetable oils	110	
Cotton	61	
Coffee	21	
Chocolate	19	

Notes: 1 Selected from schedules of commitments, which contain also commitments on additional products. Figures adjusted for base period imports.
2 Countries having provided for increases in quota levels from base levels include Austria, Canada, Colombia, Costa Rica, Czech Republic, El Salvador, European Communities, Finland, Guatemala, Hungary, Japan, South Africa, Switzerland-Liechtenstein, Thailand, United States and Venezuela.
3 As products are expressed at different stages of processing in the schedules, the totals given above are only indicative.

Price supports and other restricted domestic subsidies have to be reduced by 20 per cent over six years from the 1986-1988 base for developed countries, and 13.5 per cent for developing countries. The least developed countries do not have to make any reductions.

The agreement stipulates that no new export subsidies should be introduced. For developed countries, the money outlay spent directly subsidizing exports should fall 36 per cent over six years in 22 defined product categories. In addition, the quantity of subsidized exports is to be

reduced by 21 per cent over six years. Developing countries are to reduce export subsidy expenditures by 24 per cent over 10 years, with an additional 14 per cent reduction on the quantity of subsidized exports.

Additional provisions include a "peace clause"[9], permitted raising of trade barriers in certain circumstances through the use of special safeguards measures, and the sanitary-phytosanitary agreement. The availability of special safeguards is of some concern to exporting countries, but the agreement does impose limits on the measure's use.

2. Global forecasts

Although partial equilibrium analysis has been used to look at the implications of Uruguay Round liberalization, the most comprehensive method of calculating the overall impact is computable general equilibrium (CGE) modelling. The CGE models provide a long-run "end-result" assessment. They are unable to take account of the short-run adjustments and the many exceptions of the agreement.

Accounts of some of the many attempts to use both partial equilibrium and CGE techniques can be found in Goldin and Knudson (1990)[10], Brandao and Martin (1993)[11], and GATT.[12] Although the models' structures, assumptions and results are different, a few common conclusions can be drawn. Most studies (for example, Goldin, Knudsen and van der Mensbrugghe, 1993[13]; Duncan, Robertson and Yang, 1995[14]; Goldin and Knudsen, 1990) show relatively small changes in trade flows (less than 10 per cent) resulting from liberalization.

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9 Article 13 (Due Restraint) in the Agreement on Agriculture. Participants have agreed not to challenge domestic support or export subsidy programmes that conform with the agreement – in other words countervailing duties or dispute settlement proceedings are proscribed or restricted. This was included as an incentive for reluctant countries to accept the agreement.

10 I. Goldin and O. Knudson, eds., *Agricultural Trade Liberalization* (Paris, Organization for Economic Cooperation and Development and the World Bank, 1990).

11 A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries", in *Agricultural Economics*, 8:313-43. 1993.

12 GATT, "The Results of the Uruguay Round", op. cit.

13 Goldin, Knudsen and van der Mensbrugghe, op. cit.

14 See chapter I.

But in the GATT Secretariat's latest dynamic model, GATT[15] world trade is forecast to increase by a possible 24 per cent over 10 years, double the secretariat's earlier figure (Francois and others, 1993). It should also be noted that between 1980 and 1992, world trade grew by an average annual rate of 4 per cent.

The absolute welfare gain from the Uruguay Round agreement appears to be between $200 and $500 billion per year. In earlier studies (Goldin, Knudsen and van der Mensbrugghe, 1993), most of the global benefits from the Round were attributed to agricultural liberalization. However, GATT – found that agricultural liberalization as agreed in the Round generated only 10 to 32 per cent of the increase in world income. The reasons lie in the model's assumptions: constant returns to scale in agriculture but increasing returns in industry; imperfect substitution between products of different countries; and the absence of minimum access commitments in the model. Moreover, in terms of percentage of gross domestic product (GDP), or percentage change relative to the base scenario as reported in Parikh and others (1988), the welfare effects were modest. Only GATT yields a prediction of strong welfare gains.

Since price is the major determinant of production and consumption, most models make predictions of the effects of agricultural liberalization on world food prices. Table 4 presents some of those predictions. The following observations can be drawn from those studies:

First, most models show increases in the prices of dairy products, meat, poultry and sugar; but they give conflicting predictions about the direction of change in foodgrain prices. The conflicting grain predictions could be important. Goldin and Knudsen argued that "changes in foodgrain prices are the most politically sensitive and the primary concern of the coalition of food importing countries that have been vocal in asking for compensation in the Uruguay Round". Increases in grain prices would benefit food exporting countries but would hurt net food-importing countries. Models predicting increases include Krissoff and others.[16] Those forecasting declines include Zietz and Valdes and OECD ministerial trade mandate

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15 The GATT forecasts are actually for a range of between 9 and 24 per cent added to world trade because of the Uruguay Round. The GATT Secretariat says it believes that the more optimistic results are more likely because the assumptions are more realistic.

16 B. Krissoff, J. Sullivan and J. Wainio, "Developing Countries in an Open Economy: The Case of Agriculture", K. Anderson and R. Tyers, "How Developing Countries Could Gain from Agricultural Trade Liberalization in the Uruguay Round", and I. Goldin and O. Knudsen, eds., *Agricultural Trade Liberalization* (Paris, Organization for Economic Co-operation and Development and the World Bank, 1990).

Table 3. Impact of agricultural liberalization
(billions of US dollars a year)

Effect/country	GATT[a]		Duncan and others[b]	Anderson & Tyers[c]	Goldin and others[d]	Krissoff and others[e]	OAE[f]
	Static (1990 prices)	Dynamic (1990 prices)	(1992 prices)	(1985 prices)	(1992 prices)	(1986 prices)	(current prices)
1. Welfare effect							
– World	58.0 (1990 prices)	53.0 (1992 prices)	24.11	120	190	–	–
– Developing	11.2	14.3	3.28	56	70	–	–
– Thailand	–	–	0.48	–	0.5	–	0.2
2. Trade effect	per cent change in export		Net import (Million $)			Net export (Million $)	Export
– World		9-24	7	–	–	–	–
– Developing		14-37	-55	–	–	8-24	–
– Thailand		–	-3	–	–	0.1-0.6	2.3

Sources:
(1) GATT, 1994
(2) Duncan, Robertson and Yang, 1995
(3) Anderson and Tyers, 1990
(4) Goldin, Knudsen and Mensbrugghe, 1993
(5) Krissoff, Sullivan and Wainio, 1990
(6) Office of Agricultural Economics, 1994.

Note:
(a) Static: constance return to scale; dynamic: increasing return to scale
(b) Global agricultural liberalization as agreed in the Uruguay Round
(c) Removing all food price distortions assuming full long-run price transmission in developing countries and price-dependent productivity growth
(d) Partial agricultural trade reform, i.e., 30 per cent reduction in agricultural tariff equivalents

Table 4 (A). Price effects of agricultural liberalization
(Percentage)

Studies/assumptions	Rice	Coarse grain	Maize	Soya bean	Sugar	Coffee (green)	Poultry
A. Developed countries							
Goldin & Knudsen							
– Agric trade reform[a]	5.6	19.0			59.3		
– Agric liberalization in OECD[a]	1.9	2.5			5.2		
– Global agric liberalization[a]	-1.9	3.6			10.2		
Reduction in PSE & CSE in devleoped countries							
– Valdes & Ziety 50 per cent reduction[b]	0.9		–	-1.5	7.6		
– Valdes & Ziety 100 per cent[b]	1.7		–	-4.0	15.0		
– Tyers & Anderson 100 per cent[b]	18.0	3.0	–		22.0		
– SWOPSIM[c]	14.0		23.0	-1.0	32.0	–	16.0
– Roningen and others, 100 per cent[b]	18.1			6.8	31.0		
B. Developing countries and global							
Reduction in PSE & CSE in LDC[1] & global							
– Valdes & Ziety – LDC[c]	-21.8	–		-11.5	-12.1		
– Global[c]	-21.1			-15.9	0.8		
– IIASA – LDC[c]	1.0			–	–		
– Global[c]	16.0			–	–		
–Tyers-Anderson – Global[c]	-8.0			–	-1.0		
United States Department of Agriculture							
– North liberalization[d]	19.0		29.0	-2.0	48.0	18.0	
– Global liberalization[d]	15.0		23.0	-3.0	40.0	16.0	
ANU (as agreed in the Uruguay Round)							
– Agic liberalization – Developed countries[e]	6.9	6.8	6.8	6.8	–	3.4	1.5
– Agic liberalization – Global[e]	7.8	7.2	7.2	7.2	–	2.8	1.5

Source: (a) Goldin and Knudsen, 1993
(b) Zietz and Valdes, 1990
(c) Krissoff, Sullivan and Wainio, 1990
(d) USDA, 1990
(e) Duncan Robertson and Yang, 1995

[1] LDC = Least developed countries

model (MTM) (Moreddu, Parris, and Huff). The disparity, according to Goldin and Knudsen (1990)[17], does not only come from differences in base year and assumptions regarding the initial and final levels of production, but can also be largely attributed to differing treatment of the livestock sector in the Organization for Economic Co-operation and Development (OECD) countries.

17 I. Goldin and O. Knudsen, op. cit.

Table 4 (B). Price effects of agricultural liberalization
(Percentage)

Studies	Rice	Wheat[1]	Maize	Coarse grain	Soybean	Sugar	Meat	Dairy
C. Organization for Econimic Co-operation and Development								
Partial equilibrium models								
Anderson-Tyers[2] (projected 1995)								
a. Price – independent productivity growth	18	25	–	3	–	22	43	95
b. Price – dependent productivity growth	2	19	–	2	–	27	39	90
Zietz and Valdes[3] (OECD countries liberalize)	2	3	–	-3	-4	15	10	–
OECD/MTM[4] (OECD countries liberalize)	–	-5	–	-10		9	5	31
USDA/SWOPSIM[5] (1986 base)	11	27	22	16-22	-2	29	16	84
General equilibrium models								
IIASA[6] equilibrium models	21	18	–	11	13	–	17	31
RUN[7]	13	15		8		57	18	–
WALRAS[8]		17		–		–	10	14

Source: I Goldin and O. Knudsen eds., *Agricultural Trade Liberalization* (Paris, Organization for Econimic Cooperation and Development and the World Bank, 1990).

NB: The tables draw on the analysis presented in the chapter of the above book. For further details regarding the data presented here, refer to the relevant chapters.

(1) For some modesl includes other grains.
(2) Partial Price Transmission. Meast is ruminant meat.
(3) Meat projection is only for beef.
(4) The Ministerial Trade Mandate Model of the OECD Agriculutral Directorate forecasts 10 per cent reductions. The numbers presented here are simple multiples to provide comparative 100 per cent reductions. Meat projection are average of beef, pultry, pork and sheep price movements weighted by world production of these commodities. The MTM model is discussed in the chapter by Moreddu and others.
(5) Meat is only beef and veal, dairy is butter (cheese value is 37, milk powder 81, and fresh milk 0). The USDA/SWOPSIM model is discussed in the chapter by Krissoff and others.
(6) The IIASA model is discussed in the chapter by Frohberg and others.
(7) The RUNS model is discussed in the chapter by Bumiaux, van der Mensbrugghe and Waelbroeck.
(8) The WALRAS model is discussed in the chapter by Bumiaux and others.

Second, the predictions of partial equilibrium models show greater variations than those of CGE calculations. Price changes predicted by CGE models are in the narrower ranges of 15-18 per cent for wheat, 8-11 per cent for coarse grains and 10-18 per cent for meat. However, general equilibrium models show more variation in prices of rice – 13-21 per cent – than in prices of other commodities. Some partial equilibrium models actually suggest rice prices could decline (see table 4).

Third, two issues cannot be settled by the models. The first concerns the impact of agricultural liberalization by the developing countries. Models described in Goldin and Knudsen (1990) suggest that including developing countries in the liberalization process would significantly mute price rises (see table 4) because these countries' farmers will increase their production in response to higher prices. However, a recent simulation by the National Centre for Development Studies of the Australian National University suggests that developing country liberalization could put some slight upward pressure on world agricultural prices because reduced tariffs could boost demand for imports. The issue hinges partly on whether the price-lifting effect of imports offsets the price-depressing effect of production increases.

Also unresolved is the question of price stability, an issue of vital interest to the developing countries. Only Anderson and Tyers (1990) have suggested that the food policies of OECD countries are responsible on average for one third of fluctuations. But others argue that instability is not simply related to market intervention. Other factors, such as stockholding and market structure, are also important.

Fourth, most of the simulations consider only liberalization of direct interventions in agricultural trade. However, Krueger and others (1988) have shown that indirect measures, particularly the overvaluation of exchange rates caused by high levels of industrial protection, are much stronger than those arising from direct measures. In the Zietz-Valdes and Anderson-Tyers models, which include indirect interventions and exchange rate simulations, the authors confirm that the indirect interventions dominate the effects of direct measures. The results, therefore, imply that it is of utmost importance that developing countries first have to pursue good macroeconomic management policies. Siamwalla and Poapongsakorn (1995)[18] also argue that despite several sectoral (or direct) interventions, the Thai agricultural sector has managed to grow satisfactory mainly because of good macroeconomic policy.

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18 A. Siamwalla and N. Poapongsakorn, "Agriculture and New Economic Policies: A Thai Case study", preliminary draft (Bangkok, TDRI, 1995).

3. A more qualitative view

These calculations need some additional qualitative assessments. Among major agricultural products, wheat and rice prices are forecast to increase by a higher percentage than other crops (see table 4).

The higher **wheat** price will be the result of a combination of two factors: the substantial reduction (over 8 million tonnes by 2000) in the European Union's subsidized exports, and increased global income. United States subsidized wheat exports under the export enhancement programme will also be reduced substantially. Higher world income will significantly affect world import demand only after 2000 when the Uruguay Round begins to have a significant impact on economic growth. Countries that will be able to increase production include Argentina, Australia, Canada and the United States.

The increased access commitments of Japan and the Republic of Korea in combination with constraints in production expansion in the United States and Australia are the most important factor that could cause rice prices to increase sharply even in the short run. The reduction in domestic support in Asia and elsewhere and reduced subsidized rice exports of the European Union will only affect rice prices after the year 2000. Increased world income will have a limited impact for rice because higher incomes in Asia will bring about a faster growth rate in the consumption of processed food other than rice. In other lower income countries, higher rice prices will largely offset the increase in demand that would arise from higher incomes.

For **coarse grains,** higher world income will significantly increase world import demand. Stronger demand for livestock products will add to the increased demand for feed grains. But most of the effects will take place after 2000. Increased access commitments in Japan and the reduction in subsidized exports of coarse grains as a result of the European Union's reformed Common Agricultural Policy (CAP) will also play an important role in the coarse grain market in the long term. The United States appears to be the principal beneficiary of increased demand for coarse grains because it does not have the land expansion constraints that exist in Argentina and Canada.

For **soybean**, the Uruguay Round probably has limited implications because world trade in oilseeds and protein products is already virtually without barriers. Although higher world income will generate higher demand for livestock and with it for soybean, agricultural liberalization will enable

livestock growers in some countries, especially China, to use more grain in the animal rations.

World **sugar** markets will only be affected slightly by the Uruguay Round in the short and medium terms. The tariff-rate quotas bound by the United States and the European Union are similar to the existing voluntary export restraint (VER) system. Although the European Union and South Africa will have to reduce subsidized exports by 0.34 and 0.2 million tonnes, respectively, such commitments amount to less than 2 per cent of world trade.[19] Moreover, since the CAP reform, unsubsidized European Union exports of sugar beet has increased. Although the European Union will have to reduce its sugar production quotas, this will be offset by higher sugar beet production. However, in the long term, the increased world income will result in large increases in demand for sugar, particularly in China and other Asian countries whether *per capita* sugar consumption is still below the world average.

B. IMPACT ON THAILAND

As one of the major food exporters, Thailand stands to gain substantially from the Uruguay Round, both through welfare gains and increases in net exports (see table 3). Real income in Thailand will increase slightly by about 0.5 per cent a year. In its own CGE model for Thailand, the Office of Agricultural Economics (1994) simulated the impact of industrial tariff reductions, increases in world agricultural prices, and a reduction in domestic support for four commodities: soybeans, sugar, palm oil and milk.

The simulations show that not surprisingly changes in world prices are the most important factors affecting the farmgate prices in Thailand (see table 5). Tariff reductions in Thailand will not produce as strong an effect on prices as the increase in world prices because of the simulation high bound rates.

The Thailand Development Research Institute (TDRI) is looking at another aspect of reform. It is trying to assess how Thai agricultural supply will respond to the change. The supply response is defined as the product of shares of planted area and yield, and is assumed to depend on the price of the product being assessed, prices of other crops, and other factors. The data are disaggregated at provincial level for the 1961-1991 period.

19 United States Department of Agriculture, *Effects of the Uruguay Round Agreement on US Agricultural Commodities* (Washington, D.C., March 1994).

Table 5. Impact of the Uruguay Round on the farm gate prices in Thailand

(Percentage)

Commodities	Scenarios			
	Changes in world prices	Tariff reduction	Domestic support reduction	Total effects
Rice	4.4	0.04	0.0	4.4
Sugar	10.4	0.0	-0.16	10.2
Corn	4.7	0.0	0.0	4.7
Soybean	0.4	-0.1	0.0	0.3
Peanuts	0.3	-0.08	0.0	0.2
Mungbean	0.4	0.0	0.0	0.4
Sorghum	1.9	0.0	0.0	1.9
Jute	0.6	0.31	0.0	0.9
Cotton	0.4	0.03	0.0	0.5
Oil palm	-5.1	-0.24	0.01	-5.4
Coconut	2.4	0.07	-0.04	2.4
Coffee	0.4	-0.0	0.0	0.4
Tobacco	0.7	-0.93	0.0	-0.2
Rubber	-0.2	0.06	0.0	1.8
Vegetable-fruits	-0.4	-0.57	0.0	-0.1
Milk	-0.5	0.80	0.0	0.4
Poultry	1.1	0.02	0.0	1.1

Source: Office of Agricultural Economics, *The Impact of the GATT Agreement on the Thai Economy* (Bangkok, Ministry of Agriculture, Government of Thailand, 1994).

The results obtained so far are still preliminary. Table 6 shows that the Uruguay Round agreements will help slow down the negative growth rate of rice supply. A decline is expected because rice-growing land in irrigated areas will increasingly face water shortages. The effect of the Uruguay Round will be to slow down the switch to upland crops.

Among upland crops, sugar cane is expected to expand most rapidly as a result of a faster rate of increase in its price compared with other crops. Cassava acreage will decline further, while the land area planted with tree crops will remain virtually constant.

Table 6. Price scenarios and supply response of Thai agricultural products
(Percentage)

Price/supply	Scenarios	
	Without Uruguay Round	With Uruguay Round
1) Price assumptions		
Rice	-1.0	2.0
Upland crops	0.5	1.5
– Sugar cane	-2.5	-5.0
– Cassava	0.0	(-1.0)
– Maize	-1.0	-2.0
– Other crops	-0.75	-1.5
Tree crops	0.0	0.75
Fruit and vegetable	0.0	0.50
2) Acreage share response		
Rice	-0.22	-0.16
Upland crops	0.37	0.27
– Sugar cane	-0.90	-1.30
– Cassava	-0.20	(-0.40)
– Maize	-0.40	-0.73
Tree crops	0.20	0.08

Source: Thailand Development Research Institute Sectoral Economics Programme.

The partial and general equilibrium results described above are based on the assumption that the agreed liberalization is fully implemented. The benefits are also calculated for the long term. But in reality, implementation will be problematic. In addition, the models cannot distinguish between different countries' specific characteristics, for example the Japanese consumers' preference for japonica rice and their reluctance to accept indica rice as a substitute.

1. Thailand's gains and losses

(a) Exports and imports

The impact can be assessed by looking at Thailand's trade patterns. Table 7 shows that the top Thai agricultural exports are, respectively rice (almost 30 per cent of agricultural exports), tapioca (almost 20 per cent), and chicken (8 per cent). There are also small quantities of fruit, orchids and cut flowers; these face phytosanitary regulations. Sugar is categorized as non-agricultural; its export value is about B12-19 billion a year. These are the products that will gain from the Uruguay Round agreements.

The main imports are cotton, wheat, tobacco leaves, soybean, and in recent years maize (corn) (table 8).

Rice

The major impact on Thai rice will come through market opening in Japan and the Republic of Korea, and not through reductions in the American aggregate measure of support (AMS). This is because deficiency payments, one of two major domestic subsidies, can remain unchanged for six years. The other programme, and the one which caused so much alarm in 1986/1987, is the marketing loan programme. This is a domestic subsidy but it can significantly lower United States export prices because such a large proportion of American-grown rice is exported. However, various conditions may be unlikely to bring about a return to the large stockpiles of rice that were first created by an earlier programme and then exported as a result of the marketing loan subsidies in 1986/1987.

In addition, access to other important or potentially important markets such as the European Union, remains constant. The European Union has undertaken only to refrain from increasing current protection, keeping constant the margin between the import price and the support price. Internal supports in other Asian producing countries will be curbed.

Table 7. Share of major export products of Thailand
(Percentage)

Product	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
AGRICULTURAL AND FISHERY PRODUCTS	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1. Rice	27.41	30.31	27.36	21.66	22.45	34.52	31.25	21.20	20.41	21.61	20.49
2. Maize	11.40	11.75	9.24	9.78	3.82	3.79	2.80	3.15	2.60	0.30	0.42
3. Tapioca products	20.92	19.40	18.18	20.35	20.43	21.70	17.22	18.67	16.64	17.67	13.51
4. Fresh or frozen vegetables and fruits	1.11	1.05	1.24	0.93	0.78	1.14	1.01	1.42	1.28	1.84	2.15
5. Green coffee	0.61	0.62	1.07	1.84	1.08	1.21	1.30	0.97	0.48	0.74	0.77
6. Tobacco	2.44	1.91	1.92	1.58	1.27	1.34	0.96	1.41	1.92	2.15	1.64
7. Spices and medicinal plants	0.38	0.33	0.37	0.26	0.28	0.28	0.59	0.70	0.57	0.70	0.57
8. Orchids	0.48	0.46	0.60	0.43	0.43	0.55	0.38	0.48	0.50	0.47	0.52
9. Dried vegetables and seeds	0.04	0.05	0.10	0.17	0.21	0.20	0.20	0.41	0.44	0.37	0.36
10. Shrimps, prawns and lobsters	5.01	4.06	5.04	5.73	7.20	10.24	11.29	15.93	18.21	19.19	24.01
11. Fish, cuttle fish, squids and octopus	5.26	5.15	6.48	8.38	8.90	9.82	8.23	8.72	10.55	9.53	10.08
12. Frozen poultry cuts	1.29	1.66	1.78	3.33	1.01	4.88	4.04	5.79	6.87	6.21	5.52
13. Fresh hen eggs	0.03	0.18	0.22	0.16	0.15	0.11	0.05	0.10	0.10	0.03	0.01
14. Others	23.62	23.07	26.41	25.41	31.98	10.51	20.66	21.06	19.44	19.18	19.96
AGRO-INDUSTRIAL PRODUCTS	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1. Canned crustaceans	10.86	28.59	31.23	38.65	39.12	41.37	32.66	35.01	36.90	33.31	36.16
2. Canned vegetables and fruits	4.97	13.66	14.54	14.22	13.98	13.41	15.35	17.46	21.88	20.18	19.85
3. Sugar	16.01	24.02	25.23	23.89	23.49	19.09	30.03	25.02	18.34	21.87	14.67
4. Animal feeding products	0.55	0.77	0.67	0.65	0.66	5.17	5.31	4.91	5.62	5.23	5.99
5. Others	67.62	32.96	28.33	22.58	22.75	20.96	16.64	17.60	17.27	19.30	23.33
AGRICULTURAL AND FISHERY PRODUCTS (Percentage of total export)	50.21	48.82	42.58	40.57	33.73	24.89	28.18	22.21	20.61	20.32	17.10
AGRO-INDUSTRIAL PRODUCTS (Percentage of total export)	11.86	11.26	11.25	10.31	10.79	2.62	5.82	4.68	4.01	3.90	3.41
TOTAL VALUE OF EXPORTS (Millions of baht)	146,472	175,238	193,366	231,225	299,853	403,570	516,315	589,813	725,449	824,643	940,863

Source: Department of Business Economics, Ministry of Commerce, "Trade Statistics and Economic Indicators of Thailand 1993".

Table 8. Selected agricultural imports
(thousands of baht)

Items	Value			
	1988	percentage	1992	percentage
IMPORTS				
Food crops	2,454,333	3.14	7,349,979	4.64
Wheat	935,736	1.20	2,164,264	1.37
Maize	10,391	0.01	1,795,019	1.13
Preparations containing less than 50 per cent by weight of cocoa	645,699	0.83	1,294,064	0.82
SUGAR AND PRODUCTS	88,122	0.11	217,445	0.14
COCOA AND PRODUCTS	177,158	0.23	469,097	0.30
TEA AND COFFEE	81,576	0.10	111,352	0.07
Coffee, instant	44,097	0.06	61,482	0.04
SPIRIT AND BEVERAGE (1,000 LITRES)	1,644,484	2.10	3,337,375	2.11
OIL SEEDS	411,835	0.53	1,122,238	0.71
Soya bean	265,941	0.34	997,488	0.63
VEGETABLE OIL	336,437	0.43	769,517	0.49
Soya bean oil	106,849	0.14	194,093	0.12
Palm oil	79,088	0.10	183,771	0.12
SUNFLOWER SEED OIL CRUDE REFINED	98,500	0.13	196,934	0.12
FIBRE CROPS	12,796,646	16.36	21,471,019	13.55
Cotton, raw and linters	8,181,837	10.46	14,415,155	9.10
GARDEN CROP AND PRODUCTS	252,198	0.32	784,898	0.50
Vegetables, fresh or chilled	6,143	0.01	266,413	0.17
FRUITS AND PRODUCTS	319,859	0.41	1,204,125	0.76
Apple, fresh	166,372	0.21	917,357	0.58
SPICES	71,330	0.09	76,626	0.05
MISCELLANEOUS CROPS	60,541	0.08	108,987	0.07
OTHER FOOD PRODUCTS	633,186	0.81	1,065,038	0.67
TOBACCO	983,767	1.26	2,025,406	1.28
RUBBER AND PRODUCTS	2,545,760	3.25	6,493,508	4.10
ANIMAL FEED	3,359,777	4.30	8,524,089	5.38
ANIMAL PRODUCTS	3,966,583	5.07	12,867,033	8.12
MILK PRODUCTS	3,267,123	4.18	5,570,265	3.52
FISHERY PRODUCTS	14,584,378	18.65	23,270,249	14.69
PAPER AND PRODUCTS	8,340,086	10.66	16,839,786	10.63
FERTILIZER	7,654,688	9.79	12,585,797	7.94
PESTICIDES	2,444,934	3.13	3,286,127	2.07
MACHINERY AND APPLIANCES FOR AGRICULTURAL	4,414,466	5.64	6,996,879	4.42
WOOD AND PRODUCTS	5,525,908	7.06	19,642,813	12.40
FORESTRY PRODUCTS	808,991	1.03	1,426,762	0.90
OTHER AGRICULTURAL PRODUCTS	12,913	0.02	46,550	0.03
TOTAL	78,218,345	100.00	158,454,459	100.00

Source: Department of Customs, Government of Thailand.

Market prices: The 1990 United Nations Conference on Trade and Development (UNCTAD) estimate was for world prices of rice to increase by 18 per cent. The United States Department of Agriculture is now estimating that the farm-gate price of rice will be 12-13 per cent higher in 2000 than it would be without the Uruguay Round agreements.

The biggest impact is likely to be from market opening in Japan and the Republic of Korea.

Imports in Japan and the Republic of Korea
(tonnes and percentage of consumption under market access commitments)

	1995	2000	Duty (percentage)
Japan	379,000 (3%)	758,000	0
Republic of Korea	51,307 (1%)	205,228	5

It is interesting to note that two of Thailand's Association of South East Asian Nations (ASEAN) neighbours, Malaysia and Indonesia (both also members of the Cairns Group), have shown an extreme reluctance to make market access commitments on rice and other crops. Table 9 shows that Malaysia has no market access commitment for rice at all, while Indonesia's bound tariff rate is 90 per cent. Thai rice may also suffer a handicap in the European Union because American marketing has generated a preference among consumers for "Uncle Ben"-style parboiled rice. The existence of United States mills established in the European Union could also handicap rice from non-American sources, perhaps related to European consumers' taste for United States parboiled.

Impacts in other parts of the world are expected to be slight. Even if the Uruguay Round deal leads to an expansion of global trade and income, in poorer countries such as Africa, the effect on demand for rice arising from increases in income could be offset by the general increase in the prices of rice and other agricultural products. In richer countries (particularly in Asia where rice is a staple), the income effect could be negative – as incomes rise, rice consumption could slow down or fall. (In Thailand the income effect has been calculated to be negative both in urban and rural areas).

Table 9. Current market access of agricultural products by country

Country/product	Tariff quotas				Tariff	
	Initial		Final		Base rate of duty (percentage)	Bound rate of duty (percentage)
	Quantity	Tariff rate	Quantity	Tariff rate		
1. EUROPEAN UNION						
Rice	–	–	–	–	12.0	7.7
Tapioca products	5,500,000	6	5,500,000	6	148 ECU/T	95 ECU/T
Meat	571,092	0%	643,725	0%	20%+4,872	12.8%+3,118
Poultry	18,000	0%	29,000	0%	1,600 ECU/T	1,024 ECU/T
Sugar	1,304,700	0	1,304,700	0	424 ECU/T	339 ECU/T
Cut flowers and orchids	–	–	–	–	15.0-24.0	8.5-12.0
2. JAPAN						
Rice	379,000	Free	758,000	Free	–	–
Poultry	–	–	–	–	5.0-16.0	3.0-11.9
Sugar	–	–	–	–	84.5 Yen/kg	71.8 Yen/kg
Cut flowers and orchids	–	–	–	–	Free	Free
3. UNITED STATES						
Rice	–	–	–	–	2.8 cents/kg	1.8 cents/kg
Poultry	–	–	–	–	11.0 cents/kg	8.8 cents/kg
Sugar	910,186	1.46	1,139,195	1.46	39.8 cents/kg	33.8 cents/kg
Cut flowers and orchids	–	–	–	–	Free	Free
4. REPUBLIC OF KOREA						
Rice	51,307	5.0	102,614	5.0	–	–
Poultry	7,700 RTC	20.0	6,500 RTC	20.0	20.0-23.7	18.0
Sugar	–	–	–	–	23.7	18.0
Cut flowers and orchids	–	–	–	–	40.0	36.0
5. MALAYSIA						
Rice	–	–	–	–	45.0	40.0
Poultry	3,932	50.0-80.0	6,552.50	50.0-80.0	63.0	57.0
Sugar	17,400	5%+220.46	29,600	5%+220.46	17.0	15.0
Cut flowers and orchids	–	–	–	–	12.0	10.0
6. INDONESIA						
Rice	70,000	90.0	70,000	90.0	180.0	160.0
Poultry	–	–	–	–	70.0	40.0
Sugar	–	–	–	–	110.0	95.0
Cut flowers and orchids	–	–	–	–	70.0	60.0
7. PHILIPPINES						
Rice* (1995-1999)	59,730	50.0	119,460	50.0	–	–
(2000-2004)	119,460	50.0	238,940	50.0	–	–
Poultry	14,090	50.0	23,490	40.0	60.0-100.0	40.0
Sugar	103,400	50.0	103,400	50.0	100	50.0
Cut flowers and orchids	–	–	–	–	10.0-70.0	5.0-60.0

Source: Uruguay Round; Marakesh Protocol to the General Agreement on Tariffs and Trade 1994, Schedules of Market Access Concessions.

* National food authority (NFA) has the first right to import minimum access volumes in accordance with the food security policies of the Philippines.

Market impact: The United States Department of Agriculture's assessment (USDA)[21] 6is that long-grain rice – which Thailand exports – will benefit indirectly from market-opening in Japan and the Republic of Korea. The direct beneficiary will be medium-grain rice. While this will result in some expansion of total production, farmers in some areas will also switch grain types, reducing the supply of long grain. At the same time, the ability of farmers in the United States and Australia to switch to japonica rice is limited. USDA estimates that one third of the increase in world imports will be long-grain.

Impact on Thailand: The Thailand Development Research Institute (TDRI) has calculated preliminary estimates of the impact on Thailand from these findings. Assuming long-grain prices rise by 2 per cent annually in real terms, the amount of surplus rice available for export is likely to remain virtually constant. This would mean a slight improvement in real incomes for rice farmers, provided there is no offsetting increase in their labour costs from expansion in rival manufacturing and service sectors.

Impact on Thai rice

	2000	2010
Change in domestic consumption percentage per year	-0.86	-0.90
Change in domestic production percentage per year	-0.47	-0.20
supply-demand balance million tonnes paddy	8.82	8.89

Source: Thailand Development Research Institute, Sectoral Economics Programme.

Meanwhile, the Thai Agriculture Ministry has made the following calculations[22] using a computable general equilibrium model. Farmgate prices are estimated to increase by 4.44 per cent, apparently comparing end-results with and without the Uruguay Round agreements. Rice production is estimated to increase by 11.12 per cent which is more than TDRI's estimate; and nominal GDP by 0.22 per cent.

21 United States Department of Agriculture, ibid.

22 Office of Agriculture Economics, "The Impact of the GATT Agreement on the Thai Economy" (Bangkok, Ministry of Agriculture, February 1994).

Tapioca pellets

Thai tapioca is mainly exported in the form of pellets to the European Union. The strength of the trade arose from a loophole in the European Union's agricultural protection, dating back to a tariff binding in the Kennedy Round. Exports to the European Union are now governed by tariff quotas negotiated when the European Union unbound the tariff rate.

The main change for tapioca is likely to come from the reform of the Common Agricultural Policy rather than from the Uruguay Round. However, as the history of the agricultural negotiations shows, the two are linked.

The CAP reform will reduce the prices of European-grown cereals that compete with tapioca as feed ingredients. This will be the result of three measures: a 29 per cent cut in support prices over three years, a 29 per cent cut in domestic support (deeper than the 20 per cent required under the Uruguay Round), and a 15 per cent acreage reduction under set-aside conditions attached to income support payments.

TDRI has calculated the impact on Thai tapioca to be a reduction in the price of fresh cassava root from about 80 satang per kilogram to about 60 satang per kilogram over the three-year reform period (calculated for Nakhon Ratchasima province).[23] This is approximately break-even for farmers.

Thai production is, therefore, likely to decrease, and exports to the European Union are expected to fall below the 5.25 million tonnes per year average quota. This would wipe out any extra profit ("quota rent") previously earned. It would also seriously limit Thai tapioca pellet exports to non-European Union markets since these exports were previously only made possible through a cross-subsidy – sales to non-European Union markets were at below cost because the exporters were rewarded with shares of the profitable European Union quotas. In 1992, for example, the free on board (F.O.B.) price for exports to the Republic of Korea averaged B1.50 per kilogram compared with B2.55 for what was then the European Community, and B2.20 costs in Thailand.

23 These forecasts could not predict the weather. In fact in the 1994/1995 season, cassava prices reached record highs at more than B1.10 per kilogram because of a sharp fall in European cereal output and a decline in Thailand's cassava crop from 18-19 million tonnes to 16 million tonnes. In Thailand's case, farmers were turning to sugar cane or leaving their land fallow.

In fact, Thailand succeeded in negotiating market access to the Republic of Korea worth one million tonnes of tapioca pellets, at a 3 per cent tariff rate, in compensation for the Republic of Korea only agreeing to a 1 per cent opening for rice. It is unlikely that Thailand will be able to use this market access commitment because the necessary cross-subsidy will not be available.

Japan has also agreed to market access for tapioca pellets and chips at a 0 per cent tariff for animal feed, and at 25 per cent for other purposes. Again this is unlikely to be attractive economically. Japan allows free imports of maize at 0 per cent tariff, and maize is a better quality feed ingredient than tapioca.

Tapioca starch and flour

There may be some minor benefits from market access in Japan, particularly for more basic types of starch. Thailand has gained no market access in the European Union at all. So far, Thailand has faced tough competition in modified starch and in any case the European Union duties and levies remain prohibitively high.

Sugar

Thailand currently employs a system in which domestic consumers subsidize producers and exporters by paying a higher price than sugar normally fetches on world markets. Thailand has agreed to replace its import restrictions with a tariff quota. A modest 13,105 tonnes is to be allowed for 1995, but at a tariff of 65 per cent that would make imports more expensive than domestically produced sugar, particularly if other costs such as transport and handling are included.

The Government notified GATT that sugar subsidies totalled B5.63 billion, and this figure will have to fall by 13.3 per cent in 10 years. The largest share comes from export credit subsidies. The break-down is:

- Business tax exemption: B1.16 billion;
- Export credit: B2.25 billion;
- Domestic letters of credit: B217.7 million;
- Interest on these loans: B7.5 million;
- Credit from the Bank for Agriculture and Agricultural Cooperatives: B485.2 million.

It is understood that the export credit will in future be handled by the Export-Import Bank, whose lending is largely acceptable under the Uruguay Round agreements, and therefore the total impact of the 13.3 per cent reduction will not be large.

At present, it appears that the current system of consumers subsidizing with revenue sharing among cane-growers and refiners will remain little changed. There is, however, the possibility that some importing countries might accuse Thailand of dumping since the export price would continue to be lower than the domestic price. But most countries importing from Thailand are not producers.

Impact on world sugar markets: The major impact is unlikely to come from changes in production, but from the effect of rising incomes generated by the Uruguay Round's stimulation of world trade. USDA forecasts consumption increases in developing countries where incomes rise, such as China. In Asia, generally, *per capita* sugar consumption is well below the world average, and the propensity to spend additional income on sugar is high. The combined effect of the Uruguay Round will increase world consumption and production by 1-2 per cent above baseline projections in 2000 and 2-4 per cent in 2005. The world sugar price is projected to increase 2-5 per cent above baseline projections by 2000 and 4-8 per cent by 2005. The earlier United Nations Conference on Trade and Development (UNCTAD) prediction was for price rises of 10.6 per cent, but this would appear to be too optimistic.

For Thailand, there would appear to be little gain from price increases or from market access. Both the European Union and the United States impose quotas that are usually granted under special relationship terms to developing countries. In neither market does Thailand enjoy a special relationship. The Thai Agriculture Ministry is predicting an 8 per cent increase in exports, adding B1.1 billion to export earnings. The view in TDRI is that this is too high, and that earnings should rise 3-4 per cent approximately in line with the rise in world sugar prices.

Chicken

The main problem that has arisen is the way the European Union has calculated its minimum access commitment. The position before the Uruguay Round's implementation was that Thailand exported about 13,890 tonnes of frozen or refrigerated boneless chicken to the European Union in 1993.

- 5,100 tonnes duty free, under compensation agreed by the European Union in negotiations with the United States in return for implementing its oil-seeds support programme (under Article 28 of GATT). This is a quota granted to Thailand, part of the 15,500 tonne total compensation;

- The rest – 8,790 tonnes – under regular import levies. These took two forms in 1993: a variable levy of ECU889.6 per tonne to ECU1,062.6 and an additional levy of ECU200-400; the total coming to ECU1,289.6-1,362.6.

As a result of CAP reform, these levies have been declining. The import levy from October to December 1993 was ECU889.6 per tonne. From July to September 1994, it declined to ECU751.8 per tonne. There is also an additional levy of ECU500 per tonne. Therefore, in 1994, Thailand's exports faced a total levy of ECU1,251.8 per tonne.

Under the Uruguay Round commitments, the European Union changed its system. The levies are converted to tariffs that are due to decline by 36 per cent over six years. For the first two years, the in-quota tariffs are low, ranging from ECU93 to ECU504 per tonne. The quota for imports allowed as compensation for the oilseed programme is duty-free. Out-of-quota quantities are charged the following extra tariffs:

1995: ECU1,504 per tonne
1996: ECU1,408 per tonne
1998: ECU1,216 per tonne
2000: ECU1,024 per tonne.

In addition, the European Union's method used to calculate "minimum access" is different from the method agreed in the Uruguay Round texts. The conventional view is that the minimum access committed should either be:

- "current access", defined as the average import volume for 1986-1988; or

- a "minimum access opportunity" of 3 per cent of domestic consumption (particularly if imports during 1986-1988 were less than that).

These are then extrapolated for minimum access commitments for the years up to 2000. The European Union decided to use a combination of import figures described as "current access" and figures derived from current consumption. Thailand questions both of these. There is, however,

apparently no means of challenging the calculation since the market access commitments of the Marrakech Protocol over-ride any principles set out in the general agriculture agreement text. By initialling the Uruguay Round package, Thailand has already accepted the European Union's commitment. The minimum access figures and their calculation method was only examined by Thai officials later.

The Thai Foreign Trade Department argues that the European Union has not used the correct definition of "domestic consumption". This, the department says, should mean total consumption, within the country, of non-exported domestic produce plus imports – everything consumed domestically.

The European Union's calculations take "domestic consumption" to mean "domestic consumption of domestic produce" excluding imports. The European Union has, therefore, taken total consumption within the European Union and subtracted imports. For the year 2000, the figures come to 125,600 tonnes of meat and 29,000 tonnes of poultry. The European Union has then added 519,125 tonnes of meat obtained from import figures by an unknown method that has so far not been clarified. The number combines both red meat and poultry under the broad four-digit classification level of the harmonized system customs standard. The European Union's total commitment is, therefore, 643,725 tonnes of meat and 29,000 tonnes of poultry. The Thai department says the figures should be considerably larger for poultry irrespective of which method is used – 830,000 tonnes based on current imports or 272,800 based on current consumption. It says access should more than double the European Union's figure for meat – 1,398,000 tonnes by current access, or 1,476,500 tonnes by current consumption. Questions have also been raised as to whether the European Union is justified in including in its 29,000 tonnes minimum access for poultry, the 15,500 tonnes it has already agreed as compensation under the oilseeds deal.

The meaning of 'domestic consumption': comparison of calculations by the Thai Foreign Trade Department and the European Union
(Millions of tonnes)

	'Current access' year 2000			'Minimum access' year 2000	
	meat	poultry		meat	poultry
'The GATT method' calculated by the Thai Foreign Trade Department	1.398	0.83	**OR**	1.4765	0.2728
	Average imports, 1986-1988			*5 per cent of domesitc consumption*	
'The European Union's method' Minimum access defined as 5 per cent of consumption less 1986-1988 imports	0.519	–	**AND**	0.1246	0.029
	Meat and poultry combined				

As a result, Thailand will have to lose some of its exports to the European Union. The 5,000-tonne duty-free quota under the oilseeds compensation deal remains. Any chicken exports beyond the 5,000 tonnes will be charged higher duty than before. In practice this means about 10,000 tonnes of Thai chicken will be about 18.4 per cent dearer. If demand has a price elasticity of -1, the export quantity will also fall 18.4 per cent.

Second, the European Union could raise trade barriers against Thai chicken imports under the "special safeguards" provisions of the agriculture agreements. The European Union has notified GATT/WTO that the trigger price for taking special safeguards action against Thai chicken is ECU3,335 per tonne. The present C.I.F. price is already below the trigger price, at about ECU3,000 per tonne.

Thai chicken does not only face trade barriers at the European Union's borders. Subsidized European chicken also competes with Thai and other chicken in third markets. The European Union is committed to cutting its export subsidies on chicken from ECU440.1 billion in 1995 to ECU290.6 billion in 2000. The subsidized quantity has to fall from 137,800 tonnes in 1995 to 91,600 tonnes in 2000. Some of this should mean cuts

in European Union subsidized exports to Asia, for example in Singapore and Hong Kong.

But the European Union exports whole chickens. Thai producers are not competitive in this product because of the Government's policy of protecting Thai soybean farmers, vegetable oil producers, and fishmeal mills. Another feed ingredient, maize (corn), has a quota of 52,096 tonnes per year with a tariff of 20 per cent. The out-of-quota tariff is 81 per cent. These protectionist policies increase the costs of raising chickens. If no changes are made to these policies, Thailand is bound to lose some chicken exports, particularly since labour costs for slaughtering and processing are rising fast. China is becoming a formidable competitor.

Protection and chicken costs: tariff quotas for feed ingredients

		In-quota		Out of quota
		Minimum access quota (tonnes)	Tariff (percentage)	Tariff (percentage)
Maize	1995	52,096	20	81
	2000	54,700	20	73
Soybean meal	1995	219,580	20	148
	2000	230,559	20	133
Soybean	1995	10,402	20	84
	2000	10,922	20	80
Soybean oil	1995	2,173	20	162
	2000	2,281	20	146

Cut flowers and orchids, and canned seafood

Flowers and seafood are assessed together because the main issue is sanitary and phytosanitary regulations.

Cut flowers and orchids are unlikely to face protectionist problems in the European Union because the Thai products are imported during the European off-season. The most serious obstacles are in the Republic of Korea where the flowers are charged high import duties under policies aimed at discouraging trade in "luxury goods".

However infection, infestation and chemical residues remain a problem, both because they are genuine contaminants of Thai products and possibly because they serve as an excuse for protectionism. Three or four shipments to the Republic of Korea, worth tens of thousands of baht each, are destroyed each year because of infection, according to Thai exporters interviewed. Japan and the United States are also strict about phytosanitary regulations. Japan is the third largest market for Thai cut flowers after the European Union and the United States, taking about 40 per cent of Thai exports.

The most serious problem for orchids is infestation of thrips, a small insect. Even after fumigation, eggs survive on orchid leaves; the success rate of fumigation is 90 per cent. Next come mites and small snails, the snails arriving via the pieces of broken pots and dried coconut husks used to grow the orchids. The problem is partly one of handling. The Agriculture Department does not inspect the flowers after fumigation because to do so would cause shipment delays – thrips take 16-20 hours to die after fumigation. Before 1986, fumigation was undertaken at the destination at immense cost. Exporters now pay only 3 per cent of their original costs by fumigating before shipment.

In the context of the Uruguay Round agreement, one of the problems is different standards and regulations in different countries, despite international standards for fumigation set by the Food and Agriculture Organization of the United Nations (FAO) and the International Plant Protection Convention. The most stringent are those imposed by the Republic of Korea, Mexico and India, even though these countries do not import large quantities from Thailand. After inspection, the Republic of Korea quarantines the orchids for two or three days. Thailand successfully negotiated a reduction from five days, but even this can cause wilting, further eroding the orchids' competitiveness against local flowers. Mexico is particularly strict about thrips. India is concerned about viruses in orchids.

The protectionist threat to Thai canned seafood exports is unlikely to be so serious because the Thai bureaucracy has tended to react swiftly when action is taken in importing countries such as France and Italy. In some cases, the Thai industry has successfully met international standards, for example, an agreement reached with Canada in 1990 in which some tuna canning factories are put on a preferred status list that allows their products less stringent sampling on arrival in Canada.

Some problems remain, however, in appropriate storage of fish on board fishing vessels, and excess use of antibiotics with cultivated shrimps. In many cases the issue is bad management in Thailand rather

than abuse of sanitary regulations in importing countries. Japan, which is concerned about contamination of seafood from Thailand, has provided technical assistance, but the advice has not always been followed.

In general, the main issues that Thailand has to tackle are: the need to ensure that chemicals such as pesticides and additives are used properly, and the need for the Government to monitor closely developments in health regulations in other countries.

Thailand itself does use sanitary and phytosanitary regulations to govern its imports. On the whole these are considered to be clear and scientific, and therefore not too controversial. Some regulations might have to be eased if they are found to lack scientific evidence. There have also in the past been complaints that the Food and Drug Administration's requirements for sampling are too onerous on importers. It is not clear at this stage whether the Sanitary and Phytosanitary Agreement will have an impact.

(b) Imports and consumers

Although market access will enable consumers, feed producers and food processors to buy cheaper imported agricultural products, the in-quota tariff rates are at least 20 per cent. In some cases, the tariff rates are so high that imports may not be able to compete with domestic products. These include sugar (65 per cent in-quota), tobacco leaves (60 per cent), and instant coffee (40 per cent) (see table 10). Significantly, the sugar, cigarette and instant coffee industries are highly monopolistic. The sugar industry is a legal cartel of sugar mills and sugar farmers' associations whose objective is to maintain high domestic prices of sugar. The leading coffee company controls as much as 80 per cent of the domestic market. Although the tariff on imported instant coffee is 40 per cent, the imported green coffee bean is charged 30 per cent, giving an effective rate of protection for instant coffee of 63 per cent, assuming that the raw materials account for 70 per cent of total output value. Tobacco farmers in the North of Thailand receive a fair amount of protection through high tariff barriers of about 60 per cent, although imports are rising rapidly. The cigarette industry in Thailand is a state monopoly.

Thailand's consumers stand to gain very little from the country's commitments because the market access promised is tiny. In practice the Government could allow larger quantities at duty rates below the bound tariffs, however.

Table 10. Thailand's access commitments on agricultural products

Products	Tariff quota			Non-quota tariff rate	
	Quota (tonnes)		Rate (percentage)	1995 (percentage)	2004 (percentage)
	1995	2004			
1. Milk, not concentrated	2,286	2,400	20	46	41
2. Milk, concentrated	45,000	55,000	20	240	216
3. Potatoes	288	302	27	139	125
4. Onions	348	365	27	158	142
5. Garlic	62	65	27	63	57
6. Coconut	2,312	2,427	20	60	54
7. Copra	694	1,157	20	40	36
8. Coffee	5	5	30	100	90
9. Tea	596	625	30	100	90
10. Pepper	43	45	27	57	51
11. Maize	52,096	54,700	20	81	73
12. Rice	237,863	249,757	30	58	52
13. Soya bean	10,402	10,922	20	89	80
14. Onion seeds	3	3	30	242	218
15. Soya bean oil	2,173	2,281	20	162	146
16. Palm oil	4,629	4,860	20	159	143
17. Coconut oil	382	401	20	58	52
18. Cane or beet sugar	13,105	13,760	65	104	94
19. Instant coffee	128	134	40	55	50
20. Soya bean cake	219,580	230,559	20	148	133
21. Tobacco leaves	6,129	6,435	60	80	72
22. Raw silk	460	483	30	257	226
23. Longan, dried	5	8	30	59	53

Source: Department of Business Economics, Ministry of Commerce, Government of Thailand.

C. UNILATERAL INDUSTRIAL TARIFF REFORM

Originally, direct intervention in the form of export taxes and other measures penalized agriculture. Ammar and Suthad (1988) calculated that in the late 1980s, while this type of intervention was falling, the sector was still suffering as a result of high rates of protection for industry. Thai average import duty rates equalled the Philippines at the top of the ASEAN league. The protection amounted to an implicit tax on agriculture, through the higher costs of inputs, higher cost of living, and the distortion of the exchange rate. Therefore, in recent years, industrial protection and macro-economic policies have been the worst enemies of agriculture.

Ammar and Suthad calculated that out of all policies having a negative effect on rice in 1983/1984, industrial protection accounted for 70-75 per cent, compared with only 20-36 per cent in 1968-1975. For maize, industrial protection was the sole culprit because direct negative interventions ceased in 1981. For rubber planters, industrial protection accounted for 44-50 per cent of harmful policies.

But from January of this year (1995), the Finance Ministry has introduced a new tariff structure that simplifies rates but retains some tariff escalation. Only six rates are charged:

- 0 per cent for special raw materials;
- 1 per cent for raw materials in general;
- 5 per cent for machinery;
- 10 per cent for semi-finished products;
- 20 per cent for finished products;
- a special rate (30 per cent) for protected goods.

The effective rate of protection has been almost halved to at most 30-40 per cent. This gives a major benefit to the agricultural sector, which is an exporting sector. This is perhaps the most important result of the reform but one that few people recognize.

These rates were not a direct outcome of the Uruguay Round although the reasoning within Uruguay Round negotiations was part of the thinking that led to the reform. Almost all the rates are lower than those bound in the Marrakech Protocol's schedule of commitments. In fact, the possibility exists that if tariff rates had been bound at these new levels in the Uruguay Round, some leverage might have been available to secure better market access for Thai exports to other countries.

At the same time, as Thai consumers' incomes rise, they are likely to purchase more imported processed agricultural products. Thailand will also have to import more raw materials, such as maize (corn) and soybean meal, because domestic production is inadequate. In addition, the high levels of protection for import-substituting crops implies a bias against Thai agricultural exports, as resources are transferred from export-producing activities to import substituting ones. If the Government wants agriculture to remain competitive, it will have to reduce this protection.

D. CONCLUSION

Countries such as Thailand face a daunting task trying to interpret the complex provisions of the Uruguay Round and the many assessments of the Round's impact. There is a strong temptation to ignore the information or to treat it as so "technical" as to be almost irrelevant. Some Thai officials involved in the negotiations repeatedly call for the Government to "think through" carefully what all the implications are. Their message is important because the country needs to adjust to the changes that are taking place, and it needs to base its policy on the new circumstances.

1. The message of the numbers

The first challenge that the Thai Government faces is to assess the implications of all the calculations and predictions concerning the agricultural sector. This requires an understanding of what the figures mean. GATT's economists repeatedly urge caution:

> *...It must be emphasized that estimated increases in trade and income are not forecasts.* Not only do they ignore important parts of the Uruguay Round package ..., but by 2005 the structure of the world economy is likely to have changed considerably from the structure of the 1990 "benchmark" on which the estimates for 2005 are based. They are intended, rather, to indicate the rough order of magnitude of the trade and income gains that can be expected from the reduction or elimination of measures affecting trade in goods negotiated in the Uruguay Round.
>
> ...This is not an exercise that yields "correct" estimates. No models do because there are too many unknowns and too many limitations in the available methodologies. At the same time, the very likely impact of the liberalization of trade in goods on the levels of trade and income is very far from a complete mystery.

Widely accepted economic theory and an abundance of empirical research offer important guideposts to what can be expected.

If there is a common message from the numbers, it is that nothing dramatic is likely to happen over the coming years. The high price of cassava in the 1994/1995 season shows that the weather and other forces can have a stronger influence over the market than liberalization (in this case the European Union's CAP reform). But that does not mean that nothing should be done. Over the longer term changes will take place and some adjustments will have to be made. On balance, the rice market should strengthen with the greater export opportunities arising from market opening and some disciplines on subsidies. Thailand will also have to allow imports, the most likely sources being the lower-quality producers in Viet Nam and Myanmar. Without the Uruguay Round, Thailand would in any case have had to aim for higher quality rice and diversification to higher value crops. With the Uruguay Round, the need to grow better quality rice remains, but the industry as a whole faces a slightly better future. Other commodities such as maize and soybean face a mixed future. The Uruguay Round commitments do not require protective barriers to come crashing down. But at the same time, there are also opportunities in meat and poultry export markets that Thai producers might not be able to grasp if soybean and maize remain expensive.

2. The message of the agreements

Devising a well thought-through policy for the future does not just mean correctly interpreting the predictions. The Uruguay Round agreements impose new constraints on what governments can do. In some cases this should be useful. Many economists have long argued that the governments have been using the wrong policies to support agriculture, including futile and wasteful attempts to support prices. Their arguments have bee rejected, until recently, because of the political sensitivities involved. However, due to the new and strengthened multilateral rules, limits on domestic support will be more acceptable.

However, the agreements also contain a "green box" of permitted policies. There are sound economic as well as political arguments in favour of using these policies to support farmers' incomes at a time when industrial wages are rising and the pressures of migration are strong, to develop rural areas, and to invest in research. All of these can be seen as part of the adjustment to the liberalization, or simply as a requirement of the economic development that is already taking place. The challenge is to find the optimal combination of policies that promote the competitiveness

of Thai agriculture and those that cushion poor farmers from depressed agricultural prices.

3. The message of WTO

Thinking through agricultural policy does not simply mean devising actions to be taken inside the country. Thailand played an active role in the Uruguay Round agricultural negotiations and should continue to be active in the new World Trade Organization. There are two major aspects to this.

First, this chapter gives an indication of the complications that will continue to characterize interpretation and implementation of the agreements. There is bound to be a need to deal effectively with controversies and disputes, to respond to complaints and to complain on Thailand's own behalf. This involves more than simply reacting expost facto, for example, following what the European Union is doing with its chicken quotas and challenging the European Union's calculations. The question now being asked is whether Thailand needs to keep its hands clean in order to have the justification to challenge what others are doing. Policy-makers adhering to this view stress the need to observe closely the disciplines of the Uruguay Round agreements. Others however are more fatalistic believing that dirty tariffication is a 'fact of life'.

Second, in five years time, multilateral negotiations on agriculture are due to resume. The message of the Uruguay Round is that countries' interests are best preserved by active involvement in negotiations, right from the early stages of drafting important documents. Most countries are weary after the Uruguay Round, but some thought has to be given to what Thailand might like to see from the next round of negotiations, how the issue might be put on the agenda, and what strategies might be used. One lesson from the history of negotiations is that controversial ideas, particularly in agriculture, take a long time to become acceptable, and therefore the earlier they are put on the table, the better their chances. It is a strategy that the United States has adopted all along. A concrete example for the coming years would be a serious assessment of whether "green box" policies such as deficiency payments affect world rice markets, and if they do, how these policies might be attacked. Another lesson is that careful selection of allies, such as the Cairns Group, can increase weaker countries' bargaining power. Continued examination of potential allies' interests is important.

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PART TWO

IMPLICATIONS FOR THE LOW-INCOME NET FOOD-IMPORTING COUNTRIES OF THE ESCAP REGION IN THE POST-URUGUAY ROUND PERIOD

IV. ANALYSIS OF THE CHALLENGES ARISING FROM THE AGRICULTURE-RELATED AGREEMENTS OF THE URUGUAY ROUND

by

V.R. Panchamukhi
Biswajit Dhar
S.K. Mohanty
Research and Information System for the Non-Aligned and Other Developing Countries
New Delhi, India (RIS)

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A. INTRODUCTION

The Uruguay Round of multilateral trade negotiations concluded with a comprehensive agreement covering, among others, the agricultural sector. The Agreement on Agriculture seeks to limit the extent of farm support granted by individual countries while at the same time ensuring that countries adopt a more liberal policy as far as agricultural trade is concerned. Scheduled to be enforced from 1995 after the successor organization to the General Agreement on Tariffs and Trade (GATT), the World Trade Organization (WTO) comes into operation, the Agreement is an attempt to introduce multilateral discipline for the liberalization of agricultural trade four decades after the United States of America had insisted on continuing its protectionist policies in agriculture and had sought waivers under the GATT regime. As a result of the waivers that the United States had obtained, trade in temperate products (cereals, etc.) went outside the purview of the GATT, while tropical products remained under its jurisdiction.

The absence of any multilateral discipline had, in the past, allowed the major agricultural producers, in the main, the United States and the European Community, to provide a high degree of support to their agriculture. This support allowed these countries to protect their agricultural sector from imports and also facilitated their continued domination of the world markets by selling highly subsidized grains. Although the United States had started to pursue the farm support policies with the twin objectives of protecting domestic markets and controlling the world markets, the major beneficiary of these policies over the past few decades has been the European Community. With the Community increasing its farm support, the United States had to keep pace with the rising levels of subsidies to remain in the market, straining its already fragile federal budget as a result. By the late 1970s, this issue of increasing farm support had thus become a major issue between the two largest trading interests.

The main argument of the United States, which initiated the process of including agriculture in the GATT immediately after the conclusion of the Tokyo Round negotiations in 1979, was that the farm support policies were giving rise to severe distortions in world trade. It was argued that market interventions should be curbed and that price mechanisms should be allowed to have free play to increase global welfare. Accordingly, the United States sought complete removal of all interventions in agriculture

(the so-called "zero-option") as the multilateral discipline following the Uruguay Round negotiations. The European Community, however, was agreeable to minimal changes in the magnitude of farm support it was providing.

The seven-year-long Uruguay Round witnessed substantial shifts in the positions taken by the countries mainly involved in the agricultural negotiations, and the Agreement that was presented at its conclusion provides for only a partial liberalization of agricultural policies. The extent of price support that can be provided has been put under an upper bound. But while setting limits on price support, the Agreement allows the granting of income support to farmers. The Agreement, thus, appears to be only a small step in the direction of the liberalization of agricultural policies.

The issue of price support was, however, only one of the aspects of the negotiations covering agriculture. The Agreement on Agriculture covered several other areas, including market access and public stockholding for food-security purposes. Increased market access through tariffication of existing non-tariff barriers and establishment of minimum access opportunities for imports have been underlined in the Agreement, along with the provision for limiting public stockholding, the latter aiming to reduce the scope for intervention in the market.

Furthermore, the Agreements on Trade-Related Aspects of Intellectual Property Rights (TRIPs) and Sanitary and Phytosanitary Measures (SPS), include provisions that will determine the future of agriculture in developing countries. While the former aims at extending patent or a patent-like protection to agriculture, the latter seeks to introduce strict health and safety regulations. Through both these Agreements, the norms and standards existing in the developed countries are being extended to developing countries.

Setting the Problem

This study aims at presenting a view of the implications of the Uruguay Round Agreement on Agriculture for the net food importing low-income countries that are members of ESCAP and the prospects of the target countries in the future agricultural regime. The analysis will be done at two levels. The first part involves a detailed review in respect of five commodities/commodity-groups, namely, wheat, rice, cotton, vegetable oils and horticultural products. The trade balance in these commodities will be analyzed taking into consideration the period 1983-1992. This is the latest ten-year period for which data are available. In the second part, we make some broad observations about the possible impact of specific

provisions of the Agreement on Agriculture as well as the other Agreements, on the target countries. The emphasis of the study is on a commodity-wise review of the implications of the Uruguay Round agreements on the food deficit countries.

Sixteen countries have been included in the study, based on the criteria of food deficiency. The countries have widely divergent characteristics. For example, the two most populous countries, China and India, as well as small Pacific island countries are included.

At the outset, the study analyses the outcome of the Uruguay Round negotiations, with particular emphasis on the countries under consideration. The main provisions of the Agreement on Agriculture are discussed and the nature of policy changes that the Agreement proposes will be highlighted. The critical factor in determining the future of agricultural policies is the extent of liberalization that the developed countries are likely to undertake. Bearing this in mind, the study will discuss, in some detail, the policies of developed countries, particularly those of the United States and the European Union, in the agricultural sector.

Since the issue of agricultural liberalization became an important item on the agenda of global negotiations, there have been a number of studies that have analyzed the implications of a more liberal agricultural trading system. Many of these studies have given detailed country-wise analysis, covering all the important countries, both developing as well as developed, which have immensely facilitated the understanding of the likely scenarios of liberalization. The findings of these studies form the backdrop of the present analysis. This review together with the discussions centring around the agreements will help in understanding the characteristics of the agricultural regime that the Uruguay Round agreements seek to introduce. Based upon this understanding, the implications of the agreements and prospects for low-income and food-deficit countries in the new regime are spelt out. The study also proposes some policy recommendations with a view to strengthening national capacities in responding to the formidable challenges that this group of countries faces in the Post-Uruguay Round period.

B. GATT AND THE AGRICULTURAL SECTOR: A PROFILE OF THE MAIN ISSUES

Multilateral discipline to ensure comprehensive liberalization of agricultural trade was among the more important issues that the Uruguay Round of multilateral trade negotiations took up for consideration. This

marked a departure from the past rounds of negotiations in that for the first time GATT decided to extend its authority to trade in temperate products, in the main, cereals. Tropical products, which include tea, coffee, spices, some oil seeds and vegetable oils (palm, coconut, etc.), have been governed by the GATT discipline, but the more important temperate products had remained outside the purview of GATT.

The major issue that the Uruguay Round negotiations addressed was the nature of domestic support mechanisms that countries had put in place to protect their agriculture. It was argued that these support mechanisms distorted agricultural trade and had promoted inefficient producers while discriminating against the more efficient ones. With this view, the Uruguay Round negotiations aimed at introducing a multilateral discipline, covering all aspects of agricultural policies.

Agricultural policies will also be influenced by two other agreements contained in the Final Act of the Uruguay Round. These are: (a) the Agreement on Sanitary and Phytosanitary Measures (SPS), and (b) the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs), which extends intellectual property rights to agriculture while strengthening the standards of protection of intellectual property. In addition, the legal system that the World Trade Organization (WTO) will consider for the policy making system in regard to the agricultural sector, also becomes relevant.

These facets of multilateral discipline are discussed in the following sections. The first section attempts to highlight the factors that resulted in trade protectionism in the agricultural sector. In the second section the Uruguay Round Agreement on Agriculture will be discussed in some detail.

1. Agricultural policies in historical perspective

Although most of the thinking on trade policy among the major trading nations since the Second World War II was based on the philosophy of free trade, agriculture remained among the more important sectors in which the pre-war protectionist sentiments were allowed to prevail. The two dominant economic powers, the United States and the European Union (EU), adopted differing forms of protectionism and this determined the fortunes of agriculture the world over. At the outset, we will briefly discuss the major instruments of protection that the United States and the EU adopted.

Agricultural protection in the United States in the post-War period bore the legacy of the pre-War elements of protectionism. Trade protectionism

in the inter-war years was given a fillip by the enactment of the Smoot-Hawley Tariff Act of 1929. The Agricultural Adjustment Act (AAA) of 1933 strengthened the protection that the farm sector could enjoy. Section 22 of the AAA legalized the imposition of import controls, a position that remains unaltered. Section 22 provides a mechanism for imposing fees or quantitative restrictions on imports of agricultural products that "render or tend to render ineffective, or materially interfere with" the programmes that the United States Department of Agriculture undertakes, or "reduce substantially the amount of any product processed in United States from any agricultural commodity or product thereof".

The protectionist policies thus adopted became GATT-legal in 1955 when the United States obtained a permanent waiver from GATT obligations. In fact, GATT, from the very inception had agreed in principle to grant special status to agriculture for import restrictions to be imposed. Article XI of GATT did not allow use of quantitative restrictions or other non-tariff barriers, but in keeping with the overall protectionist sentiments as regards agriculture, a second paragraph was included which allowed exceptions to be made in the case of agriculture. Article XI.2(c) allowed countries to impose "import restrictions on any agricultural product, imported in any form, necessary to the enforcement of governmental measures" for protecting the domestic producers. The article, in other words, provided explicitly the scope for government intervention in the agricultural sector.

However, the exception provided under Article XI.2(c) was not broad enough to allow the operation of Section 22 of the AAA and this led to the United States seeking permanent waivers in order that its own protectionist policies could be pursued. Apart from Article XI.2 (c), GATT gave special treatment to agriculture under Article XVI(B).3. This article allowed the use of export subsidies in case of primary products provided that the application of the such subsidies does not result in a "contracting party [to] have more than an equitable share of world export trade ..." in the subsidized product. The added proviso of the article, however, was not effective and this impled that countries could use export subsidies virtually without any restraint.

The waiver obtained by the United States was taken as a general exception by all countries who were Contracting Parties of GATT. The importance of this waiver can be seen from the fact that despite the failure of the European Union's attempt at obtaining GATT approval for its own agricultural policy- the Common Agricultural Policy (CAP) – the Community has continued to protect its farmers.

CAP was incorporated in the Treaty of Rome which laid the formation for the European Union in 1958. Implemented in 1962, the CAP had a strong emphasis on prices. Explicitly provided were mechanisms which prevented lower priced imports from replacing the higher priced commodities produced by the Union. The price level of imported cereals was increased by imposing variable import levies on a lower priced import. An additional factor behind the adoption of CAP was shielding the European Union's markets from excessive price fluctuations in the international markets.

The objectives of CAP were served by several different instruments. Table 1 gives a summary of the instruments that were employed to keep the agricultural support policies in place.

Table 1: Main instruments of farm support adopted by the European Union

	Cereals	Sugar Veal	Dairy Meat	Beef/	Sheep	Fruits/ Vegetables	Processed Fruit	Wine
International	x	x	x	x	x	x	x	x
Storage aid			x	x	x			x
Direct aid	x		x	x	x	x	x	
Import levies and export refunds	x	x	x	x	x	x	x	x
Co-responsibility levies	x	x	x					
Guarantee threshold	x						x	
Production Quotas		x	x					

Source: Rosenblat, Julius and others, *The Common Agricultural Policy of the European Community: Principles and Consequences,* (International Monetary Fund Occasional Paper # 62, November 1988), p.7.

Pressure for change as regards farm policies came from the United States which found that from the beginning of the 1980s its share in agricultural commodity markets was on the decline. The United States was able to focus attention on the rising support to the farm sector that Europe was providing, and which, it was argued, was responsible for the loss of its export markets. The pressure for reforming agricultural policies came from yet another front – the rising burden on government budgets as a result of mounting subsidies.

These two factors translated themselves into the first initiatives to extend the GATT discipline to the agricultural sector immediately after the conclusion of the Tokyo Round negotiations in 1979. These initiatives ensured that agriculture was put in the centre stage of the preparatory work leading up to the Uruguay Round.

2. Agriculture in the Uruguay Round

The process of integrating agriculture in GATT began with the 1982 Ministerial Meeting that launched the eighth round of GATT negotiations. This meeting, in its concluding declaration, indicated that there was a need "to bring agriculture more fully into the multilateral trading system by improving the effectiveness of GATT rules.... and to seek to improve terms of access to markets and to bring export competition under greater discipline".

The 1982 Ministerial Meeting led to the establishment of a Committee on Trade in Agriculture,with 49 member states, to review three aspects of agriculture: (a) improved conditions for market access, (b) notification and examination of national agricultural policies, (c) distortions to competition in agricultural trade arising out of export subsidies.

This review by the Ministerial Meeting involved an examination of the existing GATT articles that affected free trade in agriculture. Particular reference was made to Article XI.2(c), which as mentioned earlier, allowed import restrictions to be imposed on agricultural products and Article XVI(B).3, which allowed for the use of export subsidies. More significantly, the initiative for reforming agricultural policies considered the domestic policies of the countries in order to prevent high levels of support granted by some countries to agriculture from continuing. These considerations, which were based on the arguments about distortions in agricultural trade, were translated into an exhaustive negotiating mandate adopted in 1986:

> The CONTRACTING PARTIES agree that there is an urgent need to bring more discipline and predictability to world agricultural trade by correcting and presenting restrictions and distortions including those related to structural surpluses so as to reduce the uncertainty, imbalances and instability in world agricultural markets. Negotiations shall aim to achieve greater liberalization of trade in agriculture and bring all measures affecting import access and export competition under strengthened and more operationally effective GATT rules and disciplines, taking into account the general principles governing the negotiation, by:

i). Improving market access through, inter *alia*, the reduction of import barriers;

ii) Improving the competitive environment by increasing disciplines on the use of all direct and indirect subsidies and other measures affecting directly or indirectly agricultural trade, including the phased reduction of their negative effects and dealing with their causes;

iii) Minimizing the adverse effects that sanitary and phytosanitary regulations and barriers can have on trade in agriculture, taking into account the relevant international agreements.

In order to achieve the above objectives, the negotiating group having primary responsibility for all aspects of agriculture will use the Recommendations adopted by the CONTRACTING PARTIES at their Fortieth Session which were developed in accordance with GATT 1982 Ministerial Programme and take account of the approaches suggested in the work of the Committee on Trade in Agriculture without prejudice to other alternatives that might achieve the objectives of the negotiations.

A comprehensive framework underlining multilateral discipline in the agricultural sector was finalized at the conclusion of the negotiations at the end of 1993. While the Agreement on Agriculture details the provisions upon which the policy regime in the sector is to be based in the future, the complementary Agreement on the Application of Sanitary and Phytosanitary Measures seeks to introduce strong health and safety codes that would govern trade in agricultural commodities.

3. The Uruguay Round agreements covering the agricultural sector

The Agreement seeks binding commitments from member countries in several broad areas. These include: (i) discipline in the subsidies regime, (ii) enhanced market access through increased tariffication of non-tariff barriers (NTBs) and establishment of minimum access opportunities for imports where imports were below 3 per cent of domestic consumption between 1986 and 1988, (iii) discipline on public stockholding of grains for food security, (iv) adoption of health and safety regulations in accordance with the established international standards, and (v) strengthened intellectual property protection, including the introduction of intellectual property rights in agriculture.

The Agreement on Agriculture while pushing for the liberalization of agricultural policies also recognizes the possibilities of adverse implications on the developing and the least developed countries. The latter have particularly been granted exemptions from fulfilling several commitments under the Agreement. In addition, the Uruguay Round agreements have made provisions to establish instruments to decrease the possible negative effects of trade liberalization on the least developed and the net food-importing developing countries.

(a) The subsidy discipline

(i) Domestic support commitments

The objective of the Uruguay Round negotiations in reducing the market distortions in agriculture has taken the form of a detailed specification of the type of regime that can be maintained for granting subsidies.

The initial position of the United States was that subsidies should be eliminated completely over a ten-year period (the so-called zero-option). This position, it has been indicated, was unrealistic since the United States was increasing its protection to domestic agriculture immediately preceding the Uruguay Round negotiations. After the protracted negotiations during which the United States came closer to its own reality of farm support policies, a significantly smaller reduction of subsidies was agreed to.

The subsidy discipline will be introduced by setting binding commitments on countries as regards the support they can provide to their agricultural sector. The basis for calculation of subsidies is the Aggregate Measurement of Support (AMS), which is to be calculated for each product receiving market price support, non-exempt direct payments, or any other subsidy not exempt from the reduction commitment. All other non-product specific support is to be put together into one non-product specific AMS. The subsidies that would be a part of the AMS would have to include not only budgetary outlays, but also revenue foregone. Additionally, the subsidy discipline stipulates that support provided to agriculture both at national and subnational levels has to be provided. This last mentioned proviso ostensibly takes into consideration the price support granted by federal governments in some countries.

The Uruguay Round agreements provide that domestic support policies that have, at most, a minimal impact on trade (so-called "green box" policies which first appeared in the Draft Final Act of 1991) are excluded from reduction commitments. Two classes of support can be seen as qualifying for exemption: (i) government service programmes, and (ii) direct income support to producers. Included in the first category are

government support for research programmes, pest and disease control, training services, extension and advisory services, inspection services, marketing and promotion services and infrastructural services of various kinds. Budgetary allocations for all these forms of agricultural support would not have to be included in the AMS. In a similar vein, payments to farmers under environmental programmes or to producers in disadvantaged regions would also qualify for exclusion, according to the provisions of the Agreement. However, the criteria for identifying such regions would have to be decided by the WTO.

In the second category, two forms of income support would qualify for exemption: (i) payments under production-limiting programmes, including direct payments and (ii) de-coupled income support. Support for production-limiting programmes has been exempted from being treated under AMS to encourage countries to produce less and avoid glut creating conditions in the market. This provision was included to address one of the main concerns that found expression in the negotiating mandate of the Uruguay Round, namely, the instability in agricultural prices arising out of over production.

In addition to the "green box" policies, the other policy that would not be regarded as a part of the agricultural support, (the total AMS), and which forms a part of the support package that developed countries offer, is the direct payment to producers under production-limiting programmes.

Production-limiting support that can be exempt from being treated as subsidies has to be payments made on 85 per cent or less of the base level production, the base years being defined as between 1986 and 1988. Thus, deficiency payments would have to be paid on the basis of a production level fixed at 85 per cent or less of the base year production in order to secure the exemptions.

Also exempt from the calculation of the AMS are two other measures aimed at reducing the marketable surplus of agricultural products. Programmes for the retirement of producers as well as resources employed in the past to produce marketable surplus can be supported without being affected by the subsidy discipline.

The most important exclusion allowed is the income-decoupled support. This is the principal form of support that the United States farmers enjoy and that the proposed CAP reform also entails adoption of a similar support for the European farmers.

The reduction commitments of AMS that countries have had to take has varied across countries. According to the rules that have been laid out, developed countries which do not subsidize their agriculture much have been allowed a 5 per cent ceiling on the level of subsidies they can provide. Developing countries have a higher ceiling of 10 per cent. The heavy subsidy granting countries, however, have been treated differently. They are not subjected to any upper limits, but are only expected to bring down their subsidies by 20 per cent in six years.

Under the special and differential clause, developing countries, will have to decrease their subsidies by 13.3 per cent, or two thirds of the amount by which developed countries are committed to decrease their support. The least developed countries have no commitment to undertake reductions.

As a result, the obvious advantage that the high subsidizing countries, which include the majority of developed countries, will have is not difficult to see. They have to decrease their subsidies by 20 per cent, or in other words, they can retain 80 per cent of the existing subsidies, while the developing countries can subsidize their farmers no more than 10 per cent.

It is thus quite evident that the support provided to agriculture by the European Union and the United States would decrease little, if any, in the post-Uruguay Round era. Even when their support policies have the potential of creating trade distortions, as discussed above, these countries have sought GATT sanction to continue with them.

(ii) Export Subsidies

The export subsidy discipline requires member countries to decrease the value of subsidies by 36 per cent as compared with the 1986-1990 level over the six-year implementation period of the agreement. The volume of subsidized exports would have to be decreased by 21 per cent over the same six-year period. Developing countries will have to reduce their subsidies by two thirds of the levels stipulated for developed countries. The least developed countries would not have to undertake any commitment to reduce export subsidies.

(b) Market access

Two mechanisms for committing countries to provide better market access opportunities have been identified. The first involves tariffication of NTBs and reduction of existing levels of tariff protection. The average reduction of tariffs after tariffication of NTBs will have to be 36 per cent

for developed countries and 24 per cent for developing countries. Developed countries would have a period of 6 years within which to decrease their tariff levels, while developing countries will have ten years to implement tariff cuts. Least developed countries, however, will not have to undertake any commitment to reduce their tariff levels. The second is the establishment of minimum access opportunities for imports of primary agricultural products if a country had imported less than 3 per cent of domestic consumption of such products as between 1986 and 1988.

The proposed tariffication of NTBs and reduction of levels of tariff already existing in countries is in keeping with the overall framework of the negotiations which aim at: (i) increased transparency in the imposition of trade restrictions, and (ii) progressive reduction in tariff levels. It is further provided that NTBs, once tariffied, cannot be reintroduced.

The minimum access opportunities for imports of primary commodities will have to be established if countries availed themselves of the "special treatment" clause. This clause, contained in Annex 5 of the Agreement on Agriculture, provides that if the imports of primary agricultural products and their processed products were less than three per cent of domestic consumption, minimum access opportunities of specified orders will have to be provided.

This provision thus seeks to impose the condition of a minimum import of primary agricultural commodities on countries even if they do not require to import at all or need to import only small quantities when the new GATT Agreement comes into effect. This is an area where the rules of free trade enshrined in the Uruguay Round agreements have been given up completely. Instead of using market prices as guide-posts, the level of imports are sought to be influenced by compulsory import quotas.

The proposals in the Final Act, which modify the Dunkel proposals along the same lines, provide that once the new agreement comes into operation, countries will have to provide access opportunities to imports of at least 4 per cent of their total consumption as between 1986 and 1988, except for a primary commodity which is considered as staple in the traditional diet of a developing country. In this latter case, the minimum access opportunity will have to be one per cent of the corresponding domestic consumption to begin with. The access opportunities will have to be increased annually by 0.8 per cent for the non-staple commodities for six years, implying thereby that the minimum access opportunity will have to be 8 per cent. In case of the commodity which is the staple, the minimum access opportunity will have to be increased at the beginning of the fifth year of the implementation period to two per cent of the domestic

consumption between 1986 and 1988 and further to 4 per cent at the beginning of the tenth year after the enforcement of the agreement. Lower levels of annual increments in access opportunities will be allowed if a country appeals for the special treatment provided in Annex 5.

(c) Discipline on public stockholding of grains for food security

Public stockholding of grains for food security will be subject to GATT discipline in the proposed regime. This measure is consistent with the GATT principle of reducing the scope of interventions in the market.

Developing countries have, however, been allowed to carry out public stockholding. According to the Agreement on Agriculture, stockholding of grains "whose operation is transparent and (is) conducted in accordance with officially published objective criteria" will be treated as GATT-legal, provided that the subsidy to the producers is included in the total AMS.

(d) Sanitary and phytosanitary measures

The Agreement on Application of Sanitary and Phytosanitary Measures seeks to introduce harmonized standards in respect of health and safety regulations for the protection of human, animal and plant life or health. The basis for harmonization adopted in the Agreement are three international standards. For food safety, the standards, guidelines and recommendations established by the Codex Alimentarius Commission, relating to food additives, veterinary drug and pesticide residues, contaminants, methods of analysis and sampling, and codes and guidelines of hygienic practice, are to be followed. While the animal health standards are to follow the guidelines and recommendations of the International Office of Epizootics, plant health standards are to be in line with the international standards, guidelines and recommendations developed by the Secretariat of the International Plant Protection Convention in cooperation with regional organizations operating within the framework of the International Plant Protection Convention. In setting these standards, the Agreement also obliges countries to avoid the application of any regulation that may constitute a disguised restriction on international trade.

The Agreement further recognizes the special needs of the developing countries while complying with the provisions. The Committee on Sanitary and Phytosanitary Measures, to be established to ensure effective implementation of the Agreement, has been enabled to grant developing countries, upon request, specified time-limited exceptions, in whole or in part, from the obligations under the Agreement, keeping in view their financial trade and development needs.

(e) Strengthening of intellectual property protection

The proposed patent regime under TRIPs will extend a patent or patent-like protection to agriculture and this will have far reaching implications for the cost and availability of agricultural commodities. The proposed patent regime will mark a break with the past conventions, followed by developing countries, where agriculture was left out of the patent system. This followed from the basic principle that in the case of life supporting food, patent monopoly should not be allowed.

In introducing intellectual property rights in agriculture developing countries will follow the developed countries in adopting a patent-like protection, the plant breeders' rights (PBRs) to protect improvements in plant varieties. The practice in the latter followed the increasing dominance of corporate interests in the agri-business of these countries. Agro-research had consequently passed over to the domain of the corporations who demanded property rights over the varieties they had developed. The PBRs were institutionalized in 1961 through the International Convention for the Protection of New Varieties of Plants, which is better known by its French acronym, the UPOV Convention. The UPOV Convention allowed plant breeders to enjoy a limited monopoly on the improvements they make, but at the same time it allowed farmers and researchers certain privileges. The farmers were allowed to re-use the protected varieties on their own holdings without paying any royalty to the plant breeder.

This privilege which farmers have enjoyed could be taken away through the most recent amendment to the UPOV Convention in 1991. UPOV 1991 provides that the farmers can re-use the protected varieties provided the "legitimate interests of the breeder" are taken care of, the legitimate interests of the breeder being the royalty that he should be paid for the re-use of the seeds. This is tantamount to buying the seeds anew.

(f) Measures to protect the interests of the least developed and net food-importing developing countries

Apart from the special and differential treatment that developing and least developed countries can take advantage of, the Uruguay Round agreements provide for the establishment of the mechanisms to decrease the adverse effects of trade liberalization on the more vulnerable least developed and net food-importing developing countries. The essential part of the instrumentality that is proposed is the strengthening of the Food Aid Convention of 1986.

According to the provisions agreed to in this regard, the levels of food aid commitments should be adequate in order to meet the requirements of the more vulnerable countries. Further it should be ensured that the countries in question can obtain the foodstuffs in the form of grants or on appropriate concessional terms.

4. Conclusion

The regime that the Uruguay Round agreements thus seeks to introduce in agriculture is a complex of instrumentalities. WTO, which is to monitor the implementation of the agreements, also proposes an elaborate legal structure for the world trading system. While the implications of the instrumentalities are discussed in a later section, the following section contains an analysis of the agricultural policies of developed countries.

C. POLICY RESPONSES EXPECTED FROM DEVELOPED COUNTRIES IN THE POST-URUGUAY ROUND PHASE

The Uruguay Round Agreement on Agriculture is expected to bring about some changes in the domestic policies of most countries, resulting in partial liberalization of agricultural trade. The extent of changes that each country is committed to undertake would, however, depend on the nature of the support mechanism it has, and whether this form of support needs to be brought under the new disciplines. The discussion on the Agreement in the previous section indicated that several types of domestic support would not have to be discontinued because they qualify as "green box" policies whose impact on market distortions are supposed to be minimal. The eventual impact of the Agreement on policy reform would therefore depend critically on the nature of support that the developed countries, in particular, provide, and whether or not these support mechanisms can be continued in the new policy regime.

In order to make a proper assessment of the impact of the Agreement on Agriculture on the countries included in the present study, the following discussion enumerates the nature of policy responses that are initiated or are likely to be initiated by the United States and the European Union to the Uruguay Round Agreement on Agriculture. This discussion would indicate the extent to which policy changes can be expected in these developed countries after implementation. Two dimensions of policy responses expected from the developed countries would be explored. First, the magnitude of support existing at present would be seen, and second, the types of support

policies that the two main producers extend to their farmers would be brought out.

1. Magnitude of price support to agriculture in developed countries

The decision to introduce the GATT rule of law in agriculture and the consequent introduction of agriculture as a major negotiating area in the Uruguay Round was taken to reflect a commitment, at least on the part of the initiators of this move, to reduce the level of support to agriculture. The reality is, however, quite the opposite. In recent years, a general increase in the incidence of support provided by governments in developed countries has been witnessed. The levels of subsidies that farmers in many developed countries have enjoyed have gone up steadily, particularly during the period immediately preceding the Uruguay Round. The level of subsidies, measured in terms of the producer subsidy equivalent (PSE), provided by the major agricultural producers is given in the table below.

The table shows clearly the extent to which protection given to agriculture has increased over a relatively short period of time. It is important to note that the increases in the levels of subsidies given by the United States and Australia, were much higher than that seen in the case of the EU and Japan, the traditionally high subsidizing countries.

The reduction in subsidies that these countries would have to undertake would not amount to much considering the levels of support they were providing at the beginning of the 1980s (see table 1).

Table 1. Net percentage of producer subsidy equivalent (PSEs)* to crops, 1979-1986

Countries	1979	1980	1981	1982	1983	1984	1985	1986
Australia	3	5	8	15	8	9	13	19
Canada	13	15	16	20	19	25	39	54
EC (10)	45	25	30	42	26	24	44	66
Japan	79	71	65	77	79	81	86	93
New Zealand	2	4	10	13	8	9	10	15
United States	8	9	12	14	34	21	26	45

Source: Ingersent, K.A., A.J. Rayner and R.C. Hine (eds.), *Agriculture in the Uruguay Round*, (London, St. Martin's Press, 1994), p.2.

* Percentage of PSE = Total PSEs/Total Agricultural Production x 100.

In fact, for several countries even at reduced levels in keeping with the Uruguay Round commitments, the level of support would be much higher than what was maintained at the beginning of the 1980s. Additionally, several countries, including the United States and the European Union, have claimed that their system of providing support to agriculture can continue as they qualify under the "green box" policies.

2. Developed country farm policies and reduction commitments under GATT

More significant than the magnitude of support provided by the developed countries to their agriculture is the nature of support that was provided. The support policies in the United States and the EC are examined below.

The formulation of the Uruguay Round Agreement on Agriculture was based on the consideration that multilateral discipline would be extended to only those policies which cause distortions to trade. Accordingly, policies that directly affected the unimpaired operation of prices were targeted, while all forms of support "decoupled" from production and the market have been allowed to continue.

The concept of "decoupled" support to agriculture, including direct income support, has been one of the guideposts for policy reform in most developed countries. Endorsement to this form of support came from the OECD Ministers in 1987 in whose opinion: "Rather than being provided through price guarantees or measures linked to production or to the factors of production, farm income support should, as appropriate, be sought through direct income support".

The United States took the initiative, in the 1980s, for providing generalized income support to the farmers, instead of a price support system, and this mechanism was later proposed as a part of the CAP reform by the European Union.

The United States has one of the most complex systems of providing farm support. The farm policies are underlined in the five-yearly "Farm Bills", the present set of policies are broadly in keeping with the Farm Bills of 1985 and the Food Security Act, although marginal progress was made towards greater market orientation through the 1990 Farm Bills. Support for cereals is mainly based on income support through the system of deficiency payments. A major change brought about in the 1985 Farm Bill was the substantial reduction in support prices for cereals, but at the same time the incomes of the farmers were protected through target prices

on which deficiency payments are based, and these prices were reduced only slightly. In the 1990 Farm Bill, the target prices of cereals were kept at their 1990 levels.

Support for the system of deficiency payments has been sought on the grounds that the distortions are minimized and that the only implications of following this system are on the government budget. However, as has been the case in the United States, the generalized income supports through deficiency payments can lead to significant increases in production, since they enable the farmers to operate at higher levels of average costs, they are based on farm area and are linked to the production of specific crops.

The CAP reform proposed by the European Union through the MacSharry Plan towards mid-1991, included a proposal to provide farm support based on deficiency payments. The Plan proposed substantial reductions in support prices with off-setting direct income support. Compensatory payments were proposed for reduction in support price, akin to the system of deficiency payments for cereals adopted by the United States.

The proposal thus made by the European Union has been seen as an attempt, jointly with the United States, to try to find a way around the proposals made by the former GATT Director General, Arthur Dunkel, in which certain types of support to agriculture were allowed to continue (the so-called "green box" policies). The United States claimed that its existing system of providing deficiency payments for cereals and other crops could continue as per the Dunkel proposals, while the European Union argued that its compensatory policies under the MacSharry Plan could be used without contravening the said proposals. Both these forms of direct payments have been exempted from reduction commitments in the provisions of the Final Act.

3. Conclusion

The prospects of any major shift in agricultural policy appear uncertain in the post-Uruguay Round agricultural trade. This appears so because the developed countries, whose agricultural policies have led to distortions in the world market, are likely to continue to support their agriculture at levels higher than those at the beginning of the 1980s by taking advantage of the so-called "green box" policies. In the first half of the 1980s, developed countries increased their levels of farm support several fold and this implies that despite implementation of reduction commitments, these countries' agricultural sectors will not be affected much. Additionally,

large agricultural producers such as the United States and the European Union have indicated that their main instruments of farm support would remain unaltered since they qualify for treatment under the "green box" policies.

D. IMPACT OF AGRICULTURAL LIBERALIZATION: A REVIEW OF STUDIES

The impact of agricultural liberalization has been analyzed by using a number of model-based approaches which have been documented in several studies (table 1). Most approaches limit themselves to a small number of countries in various regions with the exception of the UNCTAD/ ATPSM model that covers livestock and the feed industries in 128 countries (table 2).

The majority of models are partial equilibrium ones. The main advantage for this type of model is their relatively simple formulations. They are by and large static and they base their analysis on medium-term elasticities. The model used by Anderson and Tyres (1990) has the flexibility of being used in the dynamic context and it therefore allows evaluation of the impact of liberalization over several years.

Three general equilibrium models have been extensively referred to. These have been developed by the International Institute for Applied Systems Analysis (IIASA), the World Bank (the RUNS model, elaborated subsequently along with the OECD) and the OECD (the WALRAS model).

Most of the models that have been developed so far have tried to measure the impact of agricultural liberalization on agricultural commodity prices and income. The impact of the policy changes on the production structure, particularly the effect on productivity changes has been ignored, except in the recent study by Anderson and Tyres (1993). It has been pointed out that the introduction of the productivity dimension in the model has had significant implications for the results obtained (Trela 1994).

Among the recent studies, Goldin and others (1993) provide a more comprehensive view of the effect of liberalization of agricultural and non-agricultural sector policies. In addition to working out the income effects of liberalization, this model estimates the self-sufficiency ratios, as regards agricultural commodities, that are expected across countries in the post-liberalization phase.

Table 1. Comparison of characteristics of the existing models

Model Features	Structure	Elasticity	Temporal	Measure of Policy	Homogeneity of the products	Base period	Forecast period	Other characteristics: of the models
Anderson and Tyers 1[3]	PE	LT	Static or Dynamic	NRP	Yes	1980-1982	1995	Includes technology changes and analyses price stability
Anderson and Tyers 2[4]	PE	LT	Static	NRP	Yes	1990	1990	Includes technology changes
Zietz and Valdes	PE	LT	Static[2]	PSE	Yes	1981-1983	2000	Productivity and income growth modelled
OECD/MTN[5]	PE	MT	Static	PSE	Yes	1982-1985	1982-1985	Emphasizes cross-effects of feed products with livestock and food
USDA/SWOPSIM 1[6]	PE	MT	Static	PSE	Yes	1986	1986	Exchange rates and income effects are modelled
USDA/SWOPSIM 2[7]	PE	MT	Static	PSE	Yes	1989	1989	Exchange rates and income effects are modelled
UNCTAD/ WIDER	PE	MT	Static	PSE and policy description	Except for wheat	1984-1986	1984-1986	Broad policy, products and countries coverage
UNCTAD/ ATPSM[8]	PE	MT	Static	PSE	No	1986-1988	1986-1988	Emphasizes cross-effects of feed products with livestock and has special treatment of sugar
IIASA[9]	AGE	MT	Static (2)	NRP	Yes	beneficiaries 1981	2000	The only GE model built especially for agriculture
RUNS 1[10]	AGE	MT	Static	NRP	Yes	1986	1986	Distinction between urban and rural sectors

Table 1. (*continued*)

Model Features	Structure	Elasticity	Temporal	Measure of Policy	Homogeneity of the products	Base period	Forecast period	Other characteristics: of the models
RUNS 2[11]	AGE	LT	Dynamic	NRP (border measures) PSE (non-border measures)	Yes	1985	2002	Distinction between urban and rural sectors
WALRAS[12]	AGE	LT	Static	PSE and policy description	No	1986-1988	1986-1988	Focuses on the links between agriculture and the other sectors

Source: Irene Trela, "Agricultural trade liberalization in the Uruguay Round", report prepared by the University of Western Ontario for a United Nations Conference on Trade and Development (UNCTAD) project on, "The impact of the Uruguay Round on developing countries", (1994).

Notes:
1 PE : Partial equilibrium — AGE : applied general equilibrium
MT : Medium term — LT : long term
PSE: Producer subsidy equivalent — NEP : nominal rate of protection
2 Some elements of dynamics are introduced in the model
3 Anderson and Tyers 1 refers to Anderson and Tyers (1990)
4 Anderson and Tyers 2 refers to Anderson and Tyers (1993)
5 The OECD/MTM model as used by Moreddu and others (1990)
6 USDA/SWOPSIM as used by Krissoff, Sullivan and Wainio (1990)
7 USDA/SWOPSIM as used by Vanzetti (1993)
8 UNCTAD/ATPSM as developed by UNCTAD (1992)
9 The IIASA model as used by Frohberg and others (1990)
10 The RUNS model as used by Burniaux, van der Mensbrugghe and Waelbroeck (1990)
11 The RUNS model as used by Brandao and Martin (1993)
12 The Walras model as used by Burniaux, Martin and others (1990)

Table 2. Comparison of commodity and developing country coverage among models

Anderson and Tyers	Zeitz & Valdes	OECD/MTN	USDA/SWOPSIM	UNCTAD & WIDER	IIASA	RUNS	WALRAS	UNCTAD/ATPSM
I. Commodity coverage:								
Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Bread & cereals	Wheat
				Sorghum				Sorghum
Course grain	Course grain	Course grain	Course grain others		Course grain	Course grain		
			Corn	Corn				Corn
			Maize					Maize
Rice	Rice	Rice	Rice	Rice	Rice	Rice		Rice
Bovine & ovine Meat	Beef	Beef	Beef & veal	Beef & veal	Bovine & ovine Meat	Meat	Meat	Beef, veal & ovine meat
Other meat		Ovine	Mutton & lamb	Other animal products (pork, poultry, eggs, fish)				
								Poultry meat
		Poultry	Poultry					
		Pork	Pork					Pig meat
Dairy products		Dairy products	Fresh milk	Dairy products	Dairy products		Milk, Cheese & eggs	Dairy products
			Butter					
			Cheese					
			Milk powder					
Sugar	Sugar	Sugar	Sugar	Sugar	Other food (oils, fats, sugar, fruits, coffee, cocoa, tea)	Sugar		Sugar
	Soya	Soyabeans	Soybeans	Soybeans				Soybeans
			Soymeal					
			Soyoil	Soybean oil		Oils		Soybean oil

Table 2. (*continued*)

Anderson and Tyers	Zeitz & Valdes	OECD/MTN	USDA/SWOPSIM	UNCTAD & WIDER	IIASA	RUNS	WALRAS	UNCTAD/ATPSM
		Rapeseed	Other oilseeds	Ground nut oil				Ground nut oil
			Other oils	Palm oil				Palm oil
				Groundnut				Groundnut
				Copra				Copra
				Tea				Tea
				Coffee				Coffee
				Cocoa				Cocoa
				Fruits				Fruits
				Vegetables				Vegetables
		Manioc						
		Corn glut.feed						
		Other energy-rich feed						
		Other protein-rich feed						
		Wool						
			Cotton	Cotton	Non-food agriculture (clothing fibre industrial crops)		Cotton	
			Tobacco	Tobacco			Tobacco	
							Other Food	
II. Developing country coverage:								
LDCs[a]		Other LDCs		All countries represented individually				All countries represented individually
Bangladesh			Bangladesh					
China		China	China		China	China		
India	India	India	India		India	India		

Table 2. (*continued*)

Anderson and Tyers	Zeitz & Valdes	OECD/MTN	USDA/SWOPSIM	UNCTAD & WIDER	IIASA	RUNS	WALRAS	UNCTAD/ATPSM
Indonesia			Indonesia		Indonesia	Indonesia		
Korea, Rep. of	Korea, Rep. of	Korea, Rep. of	Korea, Rep. of					
Pakistan	Pakistan		Pakistan		Pakistan			
Philippines			Philippines					
Taiwan Prov. of China			Taiwan Prov. of China					
Thailand		Thailand	Thailand		Thailand			
			Malaysia					
			Other E. Asia			South E. Asia		
Other Asia	Other Asia		Other Asia			Other Asia		
Argentina	Argentina	Argentina	Argentina		Argentina			
Brazil	Brazil	Brazil	Brazil		Brazil	Brazil		
Mexico		Mexico	Mexico		Mexico	Mexico		
			Chile					
			Venezuela					
			Central America, Caribbean					
Other Latin America	Other Latin America		Other Latin America		Latin America	Latin America		
Egypt	Egypt		Egypt		Egypt			
Nigeria	Nigeria		Nigeria		Nigeria			
			Kenya		Kenya			
South Africa						South Africa		
Other Sub-Saharan Africa	Other Sub-Saharan Africa	Other Sub-Saharan Africa	Other Sub-Saharan Africa			Other Sub-Saharan Africa		
Other North Africa & Middle East	Other North Africa & Middle East		Middle East/ North Africa			Middle East Oil Exporters		

Table 2. (*continued*)

Anderson and Tyers	Zeitz & Valdes	OECD/MTN	USDA/SWOPSIM	UNCTAD & WIDER	IIASA	RUNS	WALRAS	UNCTAD/ATPSM
			Other Middle East/North Africa					
						Mediterranean		
							Rest of the World	

Source: Irene Trela, "Agricultural trade liberalization in the Uruguay Round", report prepared by the University of Western Ontario for a United Nations Conference on Trade and Development (UNCTAD) project on, "The impact of the Uruguay Round on developing countries", (1994).

Note: [a] least developed countries

1. Major findings

The models mentioned above have given two broad scenarios of agricultural liberalization. While on the one hand, they have considered complete liberalization of the agricultural sector, i.e., removal of all existing distortions, they have, however, worked out the implications of partial liberalization. The second approach is closer to the framework of the Uruguay Round Agreement where reduction, rather than removal of trade barriers have been proposed. The studies have indicated the price effects arising out of agricultural policy liberalization, i.e., change in the level of world prices of agricultural commodities, and also the welfare effects of liberalization for countries and country groups.

(a) Complete liberalization of agricultural trade

The complete liberalization option has been considered by assuming that both developing and developed countries adopt regimes where agricultural support policies do not exist. Frohberg and others and Moreddu and others include in their analyses the removal of only the direct forms of intervention. These are: tariffs, quotas and other interventions specific to the agricultural sector. However, studies such as, Zietz and Valdes, Anderson and Tyres and Kristoff and others, take a more comprehensive view by including in their analysis indirect interventions, such as exchange rate policies and other indirect interventions in non-agricultural sectors that could influence the agricultural sector.

(i) Price effects

The changes in the levels of world prices for major agricultural commodities have been estimated for two scenarios of complete trade liberalization: (a) by the developed countries alone, and (b) by both developed and developing countries.

Scenario I: developed country liberalization

Table 3 shows the estimated change in world prices when only developed countries undertake agricultural liberalization with developing countries maintaining the status quo.

Most of the studies, as indicated in table 3, conclude that liberalization by developed countries would result in a general increase in world prices of major agricultural commodities. Some studies, however, indicate that there could be a fall in prices of a few commodities. Thus, the estimates available from the OECD/MTM study indicate that wheat and coarse grain prices may decrease, while Zietz and Valdes have estimated

Table 3. Effects on world commodity prices of liberalization by developed countries alone

(Percentage)

	Models	Commodities					
		Wheat	Course grains	Rice	Meat	Dairy	Sugar
I	Partial equilibrium models:						
1.	Andersons and Tyers (1990)[2] (projected year 1995)	25	3	18	43	95	22
2.	Zietz and Valdes[3] (projected year 2000)	3	-3	2	10	–	15
3.	OECD/MTM[4]	-5	-10	–	5	31	9
4.	USDA/SWOPSIM[5]	27	16-22	18	16	84	29
5.	UNCTAD/WIDER	20	12-15	43	13	–	27
6.	UNCTAD/ATPSM[6]	40	18-28	50	20-41	61	39
II	General equilibrium models:						
1.	IIASA[7] (projected year 2000)	18	11	21	17	31	–
2.	RUNS[8]	15	8	14	18	–	57
3.	WALRAS[9]	17	–	–	10	14	–

Source: Ian Goldin and Ochri Knudsen, eds., *Agricultural Trade Liberalization: Implications for Developing Countries* (Organization for Economic Co-operation and Development and the World Bank, 1990), p.484) and Specific studies included in the volume; United Nations (1990); UNCTAD (1992).

Notes:

1 For some models includes other grains.

2 Partial price transmission. Meat is ruminant meat.

3 Meat project is only for beef.

4 The MTM model as used by Moreddu and others (1990) forecasts 10 per cent reductions.
The numbers presented here are simple multiples of these to provide comparative 100 per cent reductions.

5 USDA/SWOPSIM as used by Krissoff, Sullivan and Wainio (1990). Meat is only beef and veal, dairy is butter.

6 UNCTAD/ATPSM as developed by UNCTAD (1992).

7 The IIASA model as used by Frohberg and others (1990).

8 The RUNS model as used by Burniaux, van der Mensbrugghe and Waelbroeck (1990).

9 The WALRAS model as used by Burniaux, Martin and others (1990).

a small drop in the prices of coarse grains in the year 2000 (the terminal year of the study). The studies that are being discussed have found that the prices of all other commodities would rise, although the variations in price rise that the studies indicate are quite substantial.

The general equilibrium models are all in agreement about the direction of price changes in the new policy regime adopted by developed countries.

The estimates available from the studies are based on the view that removal of agricultural support in the developed countries would result in a decrease in production in these countries which would contribute to an upward pressure on prices.

Scenario II: global liberalization

Table 4 provides a summary of the estimates of price change that are available based on the assumption of liberalization undertaken by all countries. Price increases in this case are predicted to be lower than the earlier case where only developed countries' liberalization was assumed.

Most of the partial equilibrium models included in the table indicate that price rises would not take place in all commodities, unlike the earlier scenario when price changes are expected. The OECD/MTM model predicts price increases in only dairy and sugar. Three models, Anderson and Tyres (1990), Zietz and Valdes (1990), along with the OECD/MTM model, have estimated decreases in levels of prices in coarse grains and rice. Anderson and Tyres additionally find that sugar prices could decrease, while Zietz and Valdes report a similar finding in the case of wheat.

The estimates given by the partial equilibrium models thus indicate that price changes expected in the global liberalization situation is significantly different from the earlier case where only the developed countries undertake liberalization. For instance, in the case of coarse grains the partial equilibrium models indicate a fall in prices under both scenarios of liberalization, but the magnitude of price decreases are quite dissimilar. However, the only general equilibrium model, developed by IIASA, that compares price changes in the two scenarios gives results that are not widely divergent.

The most recent study using the World Bank-OECD RUNS model, Goldin and others (1993), presents another view of global liberalization. This study takes into consideration two scenarios: (i) liberalization taking place in the agricultural sector alone, and (ii) multisector liberalization. The results are given in table 5.

Table 4. Effects on world commodity prices of global liberalization
(Percentage)

	Models	Commodities					
		Wheat	Course grains	Rice	Meat	Dairy	Sugar
I	Partial equilibrium models:						
1.	Andersons and Tyers (1990)[2] (projected year 1995)	1	-88	-6	8	60	-12
2.	Zietz and Valdes[3] (projected year 2000)	-12	-24	-21	13	–	1
3.	OECD/MTM[4]	-7	-12	-5	-4	29	7
4.	USDA/SWOPSIM[5]	23	8-19	–	7	79	7
II	General equilibrium model						
1.	IIASA[6] (projected year 2000)	23	13	–	11	34	–

Source: Ian Goldin and Ochri Knudsen, eds *Agricultural Trade Liberalization:* Implications for Developing Countries (Organization for Economic Co-operation and Development and the World Bank, 1990), p.485 and specific studies included in the volume.

Notes:
1 For some models includes other grains.
2 Partial price transmission. Meat is ruminant meat.
3 Meat project is only for beef.
4 The MTM model as used by Moreddu and others (1990) forecasts 10 per cent reductions. The simple multiples of these to provide comparative 100 per cent reductions.
5 USDA/SWOPSIM as used by Krissoff, Sullivan and Wainio (1990). Meat is only beef and veal, dairy is butter.
6 The IIASA model as used by Frohberg and others (1990).

In the first scenario, Goldin predicts an increase in cereal prices by 30 per cent. Sugar prices are expected to rise the most, according to the estimates of this model. Tropical products like cocoa and coffee are expected to suffer a decline in prices.

In the second case, based on the assumption of liberalization taking place simultaneously in the agricultural and the non-agricultural sectors, prices increase but with a dampened effect as compared with the earlier case of liberalization taking place only in the agricultural sector.

Table 5. Estimates of agricultural price changes made by the RUNS model

(Percentage change in 2002 from base [1992] simulation)

Commodities	Agricultural reform	Multisector reform
Wheat	30.2	16.9
Rice	5.6	-8.7
Coarse grains	19.0	8.7
Sugar	59.3	46.6
Beef. veal and sheep	27.0	17.8
Other meats	9.9	-0.5
Coffee	-11.4	-19.8
Cocoa	-9.7	-16.6
Tea	17.5	2.1
Vegetable oils	17.7	6.1
Dairy products	52.6	40.9
Other food	-2.2	-11.6
Wool	9.8	-0.3
Cotton	15.6	1.6
Other agriculture	27.1	11.4

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

(ii) Welfare effects

The evidence for assessing the welfare implications of agricultural liberalization is rather limited. This view has been put forth by Brandao and Martin (1993) who argue that research has tended to focus on temperate zone agricultural products, i.e., cereals, diary products and sugar, in which developing countries are net importers. Thus, in a situation of partial liberalization, as discussed above, where prices of agricultural commodities are expected to increase, developing countries are seen to suffer declines in welfare.

Two partial equilibrium analyses provide indications of the welfare implications for developing countries. Kristoff and others (1990) and Anderson and Tyres (1993) discuss the two situations where (i) only developed countries undertake liberalization and, (ii) global liberalization. The results are provided in table 6.

Table 6. Estimated welfare effects of complete liberalization by developed countries and of global liberalization

(millions of US dollars)

	Krissoff and others (1990)		Anderson and Tyres (1993)	
	Developed	Global liberalization	Developed 1985	Global liberalization 1985
Bangladesh	-40	-24	-200	100
China	-69	-76	2,900	12,900
India	335	1,746	1,302	1,100
Indonesia	-105	119	400	900
Korea, Rep. of	-385	1,490	-900	6,500
Pakistan	50	317	300	400
Philippines	-27	67	0	-100
Taiwan Province of China	-273	-58	-200	400
Thailand	195	346	500	-200
Other Asia	-325	-166	500	1,700
Subtotal Asia	-644	3,761	4,600	23,700
Argentina	532	637	5,400	5,100
Brazil	-431	406	2,900	800
Mexico	-59	505	1,200	900
Other Latin America	162	716	3,200	800
Subtotal Latin America	204	2,264	12,700	7,600
Egypt	-442	-181	–	–
Nigeria	-28	24	-300	400
South Asia	19	152	600	200
Other Sub-Saharan	-64	-54	1,300	2,100
Other North Africa & Middle East	-2,184	-2,211	-2,300	-600
Subtotal	-2,699	-2,270	-700	2,100
Eastern Europe	691	729	–	–
Soviet Union	-1,373	-1,341	–	–
Rest-of-World	-1,164	-1,083	–	–
Subtotal developing countries	-4,985	2,060	16,600	33,400
Industrial countries	33,128	33,065	46,500	73,300
World Total	**28,133**	**35,125**	**62,200**	**106,400**

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

Notes: The commodity coverage of the Krissoff and others study is slightly broader than for Anderson and Tyers because Anderson and Tyers consider only temperate products: wheat, course grain, rice, ruminant meat, non-ruminant meat, dairy products and sugar, Krissoff and others also include oilseeds, cotton and tobacco. Neither study considers the tropical beverages of prime importance to many developing countries. The Krissoff and others study measures welfare changes by combining impacts on producer surplus, Marshallian consumer surplus and direct government revenues relative to a 1986 base line. Anderson and Tyers measure welfare changes in 1985 dollars using producer surplus, Hicksian consumer surplus and direct impacts on government revenues.

Scenario I: developed country liberalization

Kristoff and others predict that most developing countries will suffer declines in welfare in a situation of partial liberalization. Among the countries which are expected to gain are the two agricultural exporters, Argentina and Thailand, and two countries of South Asia, India and Pakistan. Developing countries as a group will suffer welfare decline of nearly $5 billion. More than half of this decline is expected to be accounted for Africa and the Middle East. The rest of Asia will also experience a decline in welfare.

Anderson and Tyres, however, provide a more optimistic picture in a similar situation of partial liberalization. Developing countries as a group are expected to gain more than $16 billion. Estimates for Asia show that the region as a whole will gain, with countries like China and India among the major gainers.

Scenario II: global liberalization

In the global liberalization situation, both studies, Kristoff and Anderson and Tyres, indicate that developing countries as a group would experience welfare gains. Kristoff and others give a figure of $2 billion, while Anderson and Tyres, a much healthier $33.4 billion. Asia, according to the former study is expected to suffer a decline in welfare, while the latter predicts a favourable outcome for the region.

Goldin and others present two scenarios of the implications of price changes. The first, as discussed earlier, takes into consideration agricultural liberalization alone, and the second takes a multisectoral reform framework. The estimates provided in the study indicate that gains would accrue to low income Asia, including countries such as China and India in both situations. Other agricultural exporters such as the Latin American countries and South Africa would also stand to gain, according to the study. Among the countries that are expected to suffer losses are Indonesia and Nigeria. For several countries such as India, Indonesia and Nigeria, the multisectoral reform is a worse option, they stand to gain less (in case the gains are positive) or suffer a greater degree of loss (table 7).

An interesting feature of the study by Goldin and others is the estimation of self-sufficiency ratios[1] of countries in agriculture after liberalization has taken place. Table 8 gives the self-sufficiency ratios in

1 Self-sufficiency ratios are taken in this study to represent domestic production to domestic demand.

Table 7. Gains and losses of countries
(Changes in real income)

Countries	Only agricultural reform	Multisectoral reform
Low income Asia	1.5	1.3
China	4.3	4.5
India	2.0	1.8
Upper income Asia	-5.2	8.2
Indonesia	-0.5	-2.6
Other Africa	-0.3	-0.9
Nigeria	-0.2	-1.8

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

the base year while table 9 gives the post-liberalization situation. The full liberalization situation does not appear to be beneficial for low income Asia as a whole, even though countries such as China and India are expected to be better off.

The complete liberalization situation, as indicated above, is removed from the framework upon which the Uruguay Round Agreement on Agriculture is based. The Agreement provides for partial liberalization of the agricultural sector, the scenarios that several studies have considered. The major findings are discussed below.

(b) Partial liberalization of the agricultural sector

Three studies give a comprehensive view of the situation arising out of partial agricultural liberalization, Brandao and Martin (1993), Vanzetti (1993) (the last study discussed in Trela (1994)), and Goldin and others. While the two first studies analyze within a partial equilibrium framework, Goldin and others, as discussed above, uses a CGE model. The study by Vanzetti, however, has a limitation in that developing countries are not considered as an analytical category it is, therefore, not discussed in detail here.

Table 8. Self-sufficiency ratios in base simulation (2002); Export/import ratios in base simulation

(percentage in 2002)

	Self-sufficiency ratios				Export-import ratios	
	Crops	Livestock	Tree Crops	Other Agric.	Non-ag. export	Non-ag. import
Low income Asia	0.95	1.07	1.19	0.95	88	81
China	0.80	1.23	1.46	1.12	48	48
India	0.97	1.17	1.13	0.85	45	56
Upper income Asia	1.10	0.83	2.06	0.41	97	97
Indonesia	1.00	1.14	4.86	0.69	80	88
Sub-Saharan Africa	0.94	0.88	3.57	2.30	80	78
Nigeria	0.94	0.70	6.69	0.81	98	77
South Africa	1.24	0.98	0.32	1.25	82	95
Maghreb	0.91	0.83	0.00	0.60	94	73
Mediterranean	0.99	0.77	0.87	1.08	90	83
Gulf region	0.65	0.72	0.27	0.32	99	82
Other Latin America	1.21	1.00	2.45	1.51	80	98
Brazil	1.19	1.05	2.68	0.96	41	93
Mexico	0.93	1.12	2.44	0.65	77	74
United States	1.37	0.90	0.00	1.21	87	96
Canada	1.51	0.99	0.00	0.99	93	98
Australia, New Zealand	1.59	1.81	0.00	7.58	60	99
Japan	0.71	1.11	0.15	0.17	99	92
European Community	1.15	1.12	0.00	0.49	95	99
European Free Trade Area	0.74	0.97	0.00	0.05	100	97
European economies in transition	1.28	0.97	0.00	0.74	74	92
Former Soviet Union	1.13	0.78	0.41	0.95	82	60
Africa	0.95	0.88	3.16	1.65	87	80
Low income	0.89	1.15	1.34	1.04	58	53
Latin America	1.15	1.03	2.70	1.19	72	90
Other developing	0.96	0.80	1.60	0.68	96	91
OECD	1.12	1.05	0.01	0.96	94	97
Other	1.10	0.87	0.20	0.88	78	76
Total	1.00	1.00	1.00	1.00	90	90

Source: Ian Goldin, O. Knudsen, and D. vander Mensbrugghe, eds., *Trade Liberalization: Global Economic Implications* (Organization for Economic Co-operation and Development and the World Bank, 1993).

Notes:
1. The self-sufficiency ratios represent the ratio of domestic production to domestic demand. A rate of over 1 indicates an exporting country.
2. The numbers in the fifth column represent the percentage of non-agricultural exports (in value), to the total value of exports. The sixth column represents the percentage of non-agricultural imports to the total value of imports.

Table 9. Self-sufficiency ratios in PLIB (2002) export/import ratios in PLIB

(percentage in 2002)

	Self-sufficiency ratios				Export-import ratios	
	Crops	Livestock	Tree Crops	Other Agric.	Non-ag. export	Non-ag. import
Low income Asia	0.94	1.09	1.34	0.99	90	84
China	0.83	1.29	1.30	1.06	46	58
India	0.97	1.22	1.11	0.88	43	60
Upper income Asia	1.06	0.80	1.99	0.39	98	97
Indonesia	0.98	1.20	4.87	0.72	81	87
Sub-Saharan Africa	0.93	0.92	3.48	2.38	82	80
Nigeria	0.93	0.74	6.70	0.81	99	78
South Africa	1.23	0.96	0.34	1.28	83	95
Maghreb	0.92	0.84	0.00	0.61	93	73
Mediterranean	0.98	0.80	0.90	1.13	91	84
Gulf region	0.62	0.67	0.26	0.32	100	81
Other Latin America	1.23	1.02	2.77	1.56	78	99
Brazil	1.18	1.16	2.65	1.04	39	94
Mexico	0.92	1.17	2.33	0.70	77	75
United States	1.34	0.86	0.00	1.22	88	96
Canada	1.51	0.93	0.00	1.02	94	97
Australia, New Zealand	1.60	1.82	0.00	7.60	60	99
Japan	0.67	1.03	0.15	0.18	100	99
European Community	1.13	1.06	0.00	0.53	97	99
European Free Trade Area	0.72	0.87	0.00	0.05	100	96
European economies in transition	1.28	0.95	0.00	0.78	74	90
Former Soviet Union	1.11	0.79	0.41	0.96	84	62
Africa	0.95	0.90	3.13	1.69	88	81
Low income	0.91	1.19	1.31	1.02	56	62
Latin America	1.16	1.07	2.80	1.24	70	91
Other developing	0.94	0.79	1.56	0.68	96	91
OECD	1.10	1.01	0.01	0.98	95	97
Other	1.09	0.87	0.21	0.89	80	76
Total	1.00	1.00	1.00	1.00	91	91

Source: Ian Goldin, O. Knudsen, and D. vander Mensbrugghe, eds., *Trade Liberalization: Global Economic Implications* (Organization for Economic Co-operation and Development and the World Bank, 1993).

Notes:
1. The self-sufficiency ratios represent the ratio of domestic production to domestic demand. A rate of over 1 indicates an exporting country.
2. The numbers in the fifth column represent the percentage of non-agricultural exports (in value), to the total value of exports. The sixth column represents the percentage of non-agricultural imports to the total value of imports.

The Brandao and Martin study considers the provisions of the Draft Final Act of the Uruguay Round Agreement (popularly known as the Dunkel proposals) and has drawn up four scenarios of agricultural liberalization: (i) implementation of the Dunkel proposals only in the OECD countries; (ii) implementation of the proposals in the developing countries, i.e., these countries liberalize by the some proportion as do the developed countries; (iii) developing countries decrease protectionism by two thirds of that carried out by developed countries; and (iv) developing countries alone liberalize by as much as developed countries would in the three other scenarios.

Goldin and others, however, provide an analysis of the partial liberalization situation using two scenarios: (i) partial liberalization in agriculture; and (ii) partial liberalization in all sectors.

The price and welfare (income) effects are measured in these different scenarios.

(i) Price effects

The main results of the Brandao and Martin study are given in table 10.

Table 10. World price effects under alternative liberalization scenarios
(Percentage changes from the base line)

	OECD	GLOBAL	Dunkel	Developing countries
Wheat	4.35	6.29	6.32	1.03
Rice	1.99	-2.79	4.22	-4.79
Coarse grains	2.79	4.26	4.42	1.60
Sugar	6.31	12.37	10.18	4.81
Beef, veal and sheep	5.13	4.91	6.08	-0.78
Other meats	2.20	1.14	3.20	-1.67
Coffee	0.85	-6.68	0.41	-7.48
Cocoa	0.60	-4.75	0.14	-5.28
Tea	1.88	3.82	2.34	1.99
Oilseeds	2.51	3.76	4.52	1.09
Dairy	9.67	9.04	10.13	-0.25
Other food products	0.71	-1.78	0.65	-2.31
Wool	1.65	3.24	1.96	2.41
Cotton	1.64	4.34	2.23	2.87
Other agriculture	1.23	7.35	2.23	6.27

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

The table shows that the price changes are expected to be significant on the positive side if agricultural liberalization followed the Dunkel proposals. In contrast, developing countries' liberalization is likely to bring about a decline in the prices of several commodities, among which are rice, cocoa and coffee.

Brandao and Martin provide estimates of price changes assuming endogenous productivity growth in a situation of agricultural liberalization (table 11). The directions of price changes that are available from this simulation are found to be consistent with the results obtained from the earlier case.

Table 11. World price effects under alternative liberalization scenarios with endogenous productivity growth
(Percentage changes from the base line)

	OECD	GLOBAL	Dunkel	Developing countries
Wheat	4.56	4.78	6.18	-0.15
Rice	1.95	-6.44	4.02	-8.16
Coarse grains	1.58	2.23	3.30	0.49
Sugar	5.87	11.62	9.92	4.55
Beef, veal and sheep	6.19	4.76	7.16	-1.54
Other meats	3.00	0.45	4.02	-2.74
Coffee	1.07	-7.68	1.35	-8.65
Cocoa	0.93	-7.20	0.90	-8.07
Tea	2.05	3.04	2.66	1.08
Oilseeds	1.82	2.81	3.77	0.76
Dairy	11.44	10.28	12.78	-0.71
Other food products	1.10	-1.32	1.33	-2.33
Wool	1.41	2.92	1.96	1.95
Cotton	1.37	1.54	1.82	0.30
Other agriculture	1.66	7.07	2.62	5.42

Source: *A. Brandao and W. Martin,* "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

The price effects as obtained from the Goldin and others study are given in table 12. Under partial agricultural trade reform, where only agriculture policies are liberalized, world prices are expected to increase for all cereals except rice. In the second scenario, where all sectors liberalize, the prices of all commodities are expected to increase slowly as compared with the first one. Prices of those commodities which in the first scenario are decreasing could see a sharper fall in the second scenario.

Table 12. World agricultural prices in a situation of partial liberalizations
(Percentage changes in 2002 from the base year)

	Partial liberalization in agriculture	Partial liberalization in all-sector
Wheat	5.9	3.5
Rice	-1.9	-5.0
Coarse grain	3.6	1.5
Sugar	10.2	8.0
Beef, veal and sheep	4.7	2.8
Other meats	1.0	-1.2
Coffee	-6.1	-8.2
Cocoa	-4.0	-5.7
Tea	3.0	0.1
Vegetable oils	4.1	1.7
Dairy products	7.2	5.1
Other food	-1.7	-3.8
Wool	2.0	-0.1
Cotton	3.7	0.9
Other agriculture	5.9	2.9

Source: Ian Goldin, O. Knudsen, and D. vander Mensbrugghe, eds., *Trade Liberalization: Global Economic Implications* (Organization for Economic Co-operation and Development and the World Bank, 1993).

(ii) Welfare effects of agricultural liberalization

Brandao and Martin analyze the welfare implications of agricultural liberalization for the two situations, namely, with and without endogenous productivity growth.

In the first case, developing countries are expected to gain as a group in all four scenarios; the maximum gains are expected when only these countries undertake liberalization. They would experience the least benefits in a situation where only the developed countries liberalize (table 13). The estimates provided by the study indicate that Asia as a whole would suffer a loss in welfare when developed countries liberalize, and would gain substantially when developing countries alone liberalize.

Table 13. Welfare[a] effects of agricultural trade liberalization

	OECD		GLOBAL		Dunkel		Developing countries	
	US$ million	% of GDP	US$ million	% of GDP	US$ million	% of GDP	US$ million	% of GDP
Low income Asia	358	0.1	1,001	0.4	585	0.2	600	0.3
China	-81	0.0	24,132	2.1	893	0.1	23,334	2.0
India	2,020	0.3	2,182	0.3	2,555	0.4	225	0.0
Upper income Asia	-1,126	-0.1	19,474	2.2	9,556	1.1	19,968	2.3
Indonesia	45	0.0	-616	-0.2	7	0.0	-614	-0.2
Africa	-340	-0.1	-107	0.0	-217	-0.1	208	0.1
Nigeria	134	0.1	-162	-0.1	93	0.0	-227	-0.1
South Africa	-143	-0.1	194	0.2	111	0.1	264	0.3
Maghreb	-170	-0.2	-29	0.0	-123	-0.1	45	0.0
Mediterranean	-1,054	-0.3	-908	-0.2	-975	-0.3	175	0.0
Middle East Oil exporters	-3,027	-0.6	3,161	0.6	207	0.0	6,081	1.2
Latin America	2,080	0.4	6,424	1.2	3,843	0.7	4,045	0.8
Brazil	1,595	0.2	1,996	0.3	2,057	0.3	412	0.1
Mexico	338	0.1	2,410	0.6	1,199	0.3	1,948	0.5
Total developing	**629**		**59,152**		**19,791**		**56,464**	
Eastern Europe	36	0.0	2,558	0.4	2,202	0.4	-658	0.1
CIS[b]	5,024	0.4	3,926	0.3	3,557	0.3	-859	-0.1
Total non-OECD	**5,689**		**65,636**		**25,550**		**54,947**	
United States	12,548	0.2	13,149	0.2	11,443	0.2	2,587	0.0
Canada	2,177	0.4	2,447	0.5	2,327	0.4	77	0.0
Australasia	1,722	0.5	2,057	0.6	2,145	0.6	278	0.1
Japan	14,196	0.6	16,787	0.7	13,197	0.6	2,365	0.1
E.C.[c]	33,765	0.8	30,727	0.7	26,382	0.6	-21,028	-0.5
EFTA[d]	8,258	1.3	8,258	1.3	7,810	1.2	-2,437	-0.4
Total OECD	**72,666**		**73,425**		**63,304**		**-18,158**	
Total World	**78,355**		**139,061**		**88,854**		**36,789**	

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

Notes:
a. Welfare is measured using a trade expenditure function, taking into account changes in expenditure at a fixed level of utility together with induced changes in actual revenues from production and from taxation
b. Commonwealth of Independent States
c. European Community
d. European Free Trade Association

Table 14 shows the findings of Brandao and Martin when they assume endogenous productivity growth along with liberalization. In this case, developing countries as a whole are expected to gain more as compared with liberalization without any productivity growth.

Table 14. Welfare[a] effects of agricultural trade liberalization with endogenous productivity growth

	OECD with endogenous productivity growth		GLOBAL with endogenous productivity growth		Dunkel with endogenous productivity growth		Developing countries with endogenous productivity growth	
	US$ million	% of GDP	US$ million	% of GDP	US$ million	% of GDP	US$ million	% of GDP
Low income Asia	2,361	1.0	545	0.2	2,066	0.9	-1,734	-0.7
China	4,304	0.4	81,457	7.1	7,393	0.6	74,900	6.5
India	6,288	1.0	7,983	1.2	7,905	1.2	1,681	0.3
Upper income Asia	233	0.0	21,249	2.4	9,811	1.1	20,654	2.3
Indonesia	405	0.2	-1,864	-0.7	256	0.1	-2,094	-0.8
Sub-Saharan Africa	3,626	1.5	341	0.1	3,062	1.2	-3,195	-1.3
Nigeria	973	0.4	-1,397	-0.6	570	0.2	-2,240	-1.0
South Africa	146	0.1	-309	-0.3	24	0.0	-433	-0.4
Maghreb	388	0.4	92	0.1	275	0.2	-357	-0.3
Mediterranean	468	0.1	132	-0.0	509	0.1	-181	0.0
Middle East Oil exporters	-2,123	-0.4	-1,125	-0.2	-2,395	-0.5	1,518	0.3
Latin America	4,348	0.8	10,201	1.9	6,007	1.1	5,549	1.1
Brazil	6,204	0.8	9,311	1.2	6,360	0.8	1,805	0.2
Mexico	1,678	0.4	4,345	1.0	2,421	0.6	2,409	0.6
Total developing	**29,299**		**130,961**		**44,264**		**98,282**	
Eastern Europe	1,717	0.3	2,878	0.5	3,449	0.6	-1,005	-0.2
CIS[b]	5,708	0.5	4,130	0.3	3,853	0.3	-873	-0.1
Total non-OECD	**36,724**		**137,969**		**51,566**		**96,404**	
United States	11,939	0.2	10,820	0.2	11,381	0.2	233	0.0
Canada	1,687	0.3	1,792	0.3	1,995	0.4	73	0.0
Australasia	2,299	0.6	2,046	0.6	2,737	0.7	-298	-0.1
Japan	14,959	0.6	17,690	0.8	13,447	0.6	2,991	0.1
E.C.[c]	31,552	0.7	23,879	0.5	24,128	0.5	-22,739	-0.5
EFTA[d]	8,619	1.3	8,745	1.3	7,948	1.2	-2,468	-0.4
Total OECD	**71,055**		**64,972**		**61,636**		**-22,208**	
Total World	**107,779**		**202,941**		**113,202**		**74,196**	

Source: A. Brandao and W. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries," World Bank Working Paper No. WPS 1116, 1993.

Notes:
a. Welfare is measured using a trade expenditure function, taking into account changes in expenditure at a fixed level of utility together with induced changes in actual revenues from production and from taxation
b. Commonwealth of Independent States
c. European Community
d. European Free Trade Association

But while several groups of countries are expected to suffer losses in welfare under the various scenarios, the low income countries of Asia are expected to face declines in welfare when developing countries alone liberalize.

The effects of the price changes estimated by Goldin and others are given in table 15.

Table 15. Gains and losses of countries
(Changes in real income)

	Only agricultural reform	Multisectoral reform
Low income Asia	0.4	0.6
China	1.8	2.5
India	0.3	0.5
Upper income Asia	1.9	2.6
Indonesia	-0.2	-0.7
Other Africa	0.0	-0.2
Nigeria	-0.1	-0.4

Source: Ian Goldin, O. Knudsen, and D. vander Mensbrugghe, eds., *Trade Liberalization: Global Economic Implications* (Organization for Economic Co-operation and Development and the World Bank, 1993).

According to this study, low income Asia is expected to register a small increase in welfare as a result of the liberalization. The upper income countries in the regime, however, are expected to do much better. Among the countries in Asia, Indonesia is expected to suffer losses in welfare.

Multisectoral reform is expected to bring larger gains for the countries in Asia as compared with the situation where only the agricultural sector undergoes partial liberalization.

As for the self-sufficiency of countries in agriculture Goldin and others indicate that the partial liberalization situation is expected to affect the low income countries in Asia (table 16).

Table 16. Self-sufficiency ratios export/import ratios
(Percentage in 2002)

	Self-sufficiency ratios				Export-import ratios	
	Crops	Livestock	Tree crops	Other agriculture	Non-agricultural export	Non-agricultural import
Low income Asia	0.94	1.21	1.66	1.04	83	86
China	0.93	1.53	1.07	0.99	32	80
India	0.98	1.44	1.08	0.95	27	67
Uper income Asia	1.90	0.76	2.08	0.25	97	91
Indonesia	0.95	1.35	4.85	0.80	83	87
Sub-Saharan Africa	0.89	1.07	3.27	2.52	80	79
Nigeria	0.92	0.88	6.76	0.76	98	80
South Africa	1.19	0.95	0.36	1.34	84	93
Maghreb	0.97	0.90	0.00	0.64	87	71
Mediterranean	0.93	0.96	0.97	1.24	92	86
Gulf region	0.50	0.41	0.21	0.34	100	68
Other Latin America	1.28	1.14	3.16	1.67	71	97
Brazil	1.19	1.52	2.75	1.23	31	92
Mexico	0.88	1.35	2.14	0.80	73	75
United States	1.30	0.67	0.00	1.25	90	92
Canada	1.52	0.75	0.00	1.09	94	95
Australia, New Zealand	1.69	1.92	0.00	7.47	57	99
Japan	0.51	0.78	0.16	0.19	100	86
European Community	1.07	0.86	0.00	0.61	98	95
European Free Trade Area	0.57	0.55	0.00	0.06	100	91
European economies in transition	1.26	0.93	0.00	0.88	70	82
Former Soviet Union	1.06	0.86	0.42	0.94	85	65
Africa	0.93	0.98	3.06	1.75	80	80
Low income	0.96	1.35	1.26	1.00	42	79
Latin America	1.17	1.22	2.92	1.36	62	90
Other developing	0.87	0.76	1.51	0.62	96	86
OECD	1.06	1.89	0.01	1.01	95	93
Other	1.06	0.91	0.22	0.90	78	75
Total	1.00	1.00	1.00	1.00	89	89

Source: I. Goldin, O. Knudsen, and D. vander Mensbrugghe, eds., *Trade Liberalization: Global Economic Implications* (Organization for Economic Co-operation and Development and the World Bank, 1993).

Notes:
1. The self-sufficiency ratios represent the ratio of domestic production to domestic demand. A rate of over 1 indicates an exporting country.
2. The numbers in the fifth column represent the percentage of non-agricultural exports (in value), to the total value of exports. The sixth column represents the percentage of non-agricultural imports to the total value of imports.

The self-sufficiency ratios of low income countries in Asia in the case of crops is expected to decrease over the base year (1992). Among individual countries in the region, China and India are predicted to improve their overall self-sufficiency ratios, while Indonesia could suffer a decline in self-sufficiency in crops and an increase in the other agricultural commodities.

2. Conclusion

The studies discussed above indicate that the prices of several commodities will tend to increase. What is, however, not clear from the studies is the magnitude of price increases that can be expected due to the divergent results obtained from the models.

These results need to be evaluated against the assumptions the models make about liberalization, albeit partial liberalization, by the developed countries. The discussion in an earlier section showed that developed countries had evolved instruments for furthering protectionism in agriculture which would not be objectionable at the WTO. Given this scenario, there will be no dramatic policy changes in the post-Uruguay Round phase and, the prevailing structures of world production and trade in agriculture are likely to perpetuate, by and large.

E. IMPLICATIONS OF THE URUGUAY ROUND AGREEMENTS ON THE LOW-INCOME FOOD DEFICIT COUNTRIES

The first section describes the nature of the commodity import balance in the net-agricultural importing low income countries in the ESCAP region, and refers particularly to the food deficit countries in the region. The net import position in these countries has been focused on due to the commonly held view that the prospects for the developing countries in the new agricultural trade regime would depend to a large extent on the nature of their agricultural trade balances.[1] The second part of this section deals with the implications of the main dimensions of the Uruguay Round agreements for the low-income net food deficit (LIFD) countries of the ESCAP region.

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1 See for example, FAO, *The Uruguay Round Agreement and its Implications for Food Security*, CFS:94/Inf.5, March 1994, p.8.

1. Sample countries and their characteristics

Although the study seeks to define the sample countries using two criteria, namely, net imports of agricultural products and food deficiency, not all countries that are net-food importers are at the same time net agricultural importers. The countries under examination have been selected, therefore, on the basis of the criterion of food deficiency, owing to the consideration that in low-income countries, the availability of assured supplies of food is of primordial importance.

The food-deficit countries have been identified using the basis laid down by the Food and Agriculture Organization of the United Nations (FAO). These include all food deficit countries with per capita income below $1,235 (in 1990), whom the World Bank considers eligible for IDA assistance. Sixteen countries of the Asia-Pacific region have been identified.

Appendix I of this section gives a list of these countries and their main characteristics. Eleven of the 16 countries are least developed countries (LDCs) as defined by the United Nations, while the other five are China, India, Indonesia, Pakistan and Sri Lanka.

The share of the agricultural sector in their respective gross domestic product (GDP) shows a fair degree of variance between countries. While in Nepal agriculture still makes up for more than half of the country's GDP, in Indonesia its share is less than a fifth. In China, Sri Lanka and Pakistan, the farm sector makes up for a fourth of the countries' GDP and in India and Bangladesh it is about a third.

The trade in agricultural commodities by these countries is given in tables 1 to 3. As a whole, these countries were net exporters of agricultural commodities in the period 1983-1982. Indonesia, Myanmar, Sri Lanka and India have consistently been net agricultural exporters while China and Afghanistan have been net exporters only for the period taken as a whole. Yet another country, the Lao People's Democratic Republic became a net exporting country only in the latter half of the period under consideration.

The export surpluses that these countries have shown in all years barring the initial year, 1983, have been contributed mainly by China, Indonesia and India. Table 3 shows that when the above three countries are excluded, the remaining countries as a group were, in fact net importers except for the two initial years in which they were net exporters.

Table 1. Imports of agricultural commodities
(millions of US dollars)

Country/year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Afghanistan	115.4	110.3	77.0	166.1	139.0	135.3	194.5	214.1	111.2	124.5
Bangladesh	444.4	601.2	602.5	486.0	603.5	912.1	763.1	767.3	604.0	655.7
Bhutan	7.2	7.8	7.7	8.9	8.4	8.7	9.2	16.2	12.7	13.8
Cambodia	25.9	33.7	18.8	23.1	22.0	32.8	17.9	11.9	10.1	32.6
China	6,507.4	5,576.8	4,525.6	5,411.9	7,193.7	9,640.8	10,981.7	9,793.9	9,429.1	9,577.1
India	1,828.1	2,230.1	1,425.9	1,276.5	1,551.1	1,902.3	1,261.8	1,084.7	811.8	1,676.5
Indonesia	1,422.6	1,100.9	849.6	934.7	1,124.5	1,319.3	1,622.2	1,591.1	2,051.0	2,541.3
Kiribati	4.7	4.7	4.7	4.6	5.7	7.4	7.9	8.2	9.4	9.2
Lao People's Democratic Republic	12.3	13.0	9.7	9.6	15.1	13.6	32.6	26.6	15.0	19.3
Maldives	8.3	7.3	6.1	7.9	7.0	10.1	10.4	22.1	27.2	26.4
Myanmar	22.2	25.7	34.0	21.8	13.5	19.0	18.6	96.3	83.7	103.6
Nepal	53.3	51.7	47.3	70.0	77.6	106.4	91.9	127.1	133.9	130.7
Pakistan	787.1	1,110.0	1,190.1	1,142.5	906.0	1,074.6	1,374.4	1,399.1	1,204.8	1,319.7
Samoa	10.2	10.6	10.4	11.8	12.1	14.8	15.2	18.9	18.8	19.0
Sri Lanka	340.0	301.7	330.8	338.5	304.9	426.8	525.2	493.7	524.2	485.4
Vanuatu	11.6	8.0	7.3	11.9	11.5	10.8	12.2	14.0	15.2	17.4
Total	11,600.7	11,193.5	9147.5	9,925.8	11,995.6	15,634.8	16,938.8	15,685.2	15,062.1	16,752.2
Total for LDCs[a]	715.5	874.0	825.5	821.7	915.4	1271.0	1,173.5	1,322.7	1,041.2	1,152.2

[a] Least developed countries.

Table 2. Exports of agricultural commodities
(millions of US dollars)

Country/year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Afghanistan	268.8	240.3	166.8	226.2	242.7	252.8	188.4	143.2	114.4	90.6
Bangladesh	177.4	199.0	220.1	186.2	158.4	159.7	171.5	160.3	143.7	163.6
Bhutan	5.6	5.6	5.8	5.3	5.4	3.5	3.9	11.6	2.8	2.8
Cambodia	11.0	12.0	12.5	19.0	20.0	24.9	22.4	13.9	19.4	20.2
China	4,463.5	5,056.4	5,873.2	8,116.4	8,532.2	10,203.5	10,283.8	10,204.0	11,619.9	11,583.2
India	2,370.2	2,361.8	2,235.8	2,331.0	2,360.1	2,175.4	2,656.0	3,078.2	3,048.4	3,198.6
Indonesia	2,056.9	2,462.0	2,445.2	2,528.3	2,692.8	3,323.0	2,962.6	2,802.4	3,122.5	3,326.6
Kiribati	1.9	6.1	4.0	0.3	1.3	3.3	2.5	0.8	1.6	0.0
Lao People's Democratic Republic	7.7	10.2	10.5	6.6	2.9	24.6	43.7	35.2	20.0	21.9
Maldives	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Myanmar	220.5	189.1	126.6	140.7	98.2	24.1	66.9	167.2	150.7	202.9
Nepal	31.5	41.5	16.1	65.6	52.7	67.8	51.8	46.7	55.4	70.4
Pakistan	795.8	783.2	695.5	1,051.1	944.2	1,239.8	1,488.6	986.7	1,033.2	1,236.9
Samoa	15.1	17.8	10.5	8.0	7.9	12.2	11.4	7.8	8.9	8.5
Sri Lanka	631.3	896.6	676.2	577.2	601.4	637.2	645.7	745.3	661.6	497.1
Vanuatu	17.4	29.9	16.2	8.2	11.4	13.2	10.9	12.0	11.3	13.3
Total	11,074.6	12,311.5	12,515.0	15,270.1	15,731.6	18,165.0	18,610.1	18,415.3	20,013.8	20,436.6
Total for LDCs[a]	756.9	751.5	589.1	666.1	600.9	586.1	573.4	598.7	528.2	594.2

[a] Least developed countries.

Table 3. Import balance of agricultural commodities

(millions of US dollars)

Country/year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Afghanistan	-153.4	-130.0	-89.8	-60.1	-103.7	-117.5	6.1	70.9	-3.2	33.9
Bangladesh	267.0	402.2	382.4	299.8	445.1	752.4	591.6	607.0	460.3	492.1
Bhutan	1.6	2.2	1.9	3.6	3.0	5.2	5.3	4.6	9.9	11.0
Cambodia	14.9	21.7	6.3	4.1	2.0	7.9	-4.5	-2.0	-9.3	12.4
China	2,043.9	520.4	-1,347.6	-2,704.5	-1,338.5	-562.7	697.9	-410.1	-2,190.8	-2,006.1
India	-542.1	-131.7	-809.9	-1,054.5	-809.0	-273.1	-1,394.2	-1,993.5	-2,236.6	-1,522.1
Indonesia	-634.3	-1,361.1	-1,595.6	-1,593.6	-1,568.3	-2,003.7	-1,340.4	-1,211.3	-1,071.5	-785.3
Kiribati	2.8	-1.4	0.7	4.3	4.4	4.1	5.4	7.4	7.8	9.2
Lao People's Democratic Republic	4.6	2.8	-0.8	3.0	12.2	-11.0	-11.1	-8.6	-5.0	-2.6
Maldives	8.3	7.3	6.1	7.9	7.0	10.1	10.4	22.1	27.2	26.4
Myanmar	-198.3	-163.4	-92.6	-118.9	-84.7	-5.1	-48.3	-70.9	-67.0	-99.3
Nepal	21.8	10.2	31.2	4.4	24.9	38.6	40.1	80.4	78.5	60.3
Pakistan	-8.7	326.8	494.6	91.4	-38.2	-165.2	-114.2	412.4	171.6	82.8
Samoa	-4.9	-7.2	-0.1	3.8	4.2	2.6	3.8	11.1	9.9	10.5
Sri Lanka	-291.3	-594.9	-345.4	-238.7	-296.5	-210.4	-120.5	-251.6	-137.4	-11.7
Vanuatu	-5.8	-21.9	-8.9	3.7	0.1	-2.4	1.3	2.0	3.9	4.1
Total	526.1	-1,118.0	-3,367.5	-5,344.3	-3,736.0	-2,530.2	-1,671.3	-2,730.1	-4,951.7	-3,684.4
Total for LDCs[a]	-41.4	122.5	236.4	155.6	314.5	684.9	600.1	724.0	513.0	558.0

[a] Least developed countries.

More importantly, the least developed countries were net importers for the whole period with the exception of the first year. The level of net imports of the least developed countries was distinctly higher in the latter half of the period.

From among the net importing countries, the four small island countries, Maldives, Kiribati, Samoa and Vanuatu, are facing increased import dependence. All these countries had progressively larger import surpluses, particularly since the end of the 1980s. The deterioration in the net trade position was particularly significant in the cases of Vanuatu and Samoa which were both net exporters of agricultural commodities until the mid-1980s. Kiribati was also a net exporter in 1984, following which it was a net importer. Maldives, however, was a consistent net importer of agricultural commodities.

Bhutan and Nepal had substantially larger import surpluses at the end of the period than they had at the beginning. Bhutan went through two phases of net import surges in the mid-1980s followed by another in the early 1990s. Similarly, Nepal experienced a surge in imports coupled with a sharp drop in exports between 1989 and 1990. Although the following two years saw a small decline in the level of net imports, it was significantly higher than the peak net imports of the 1980s.

Of the remaining net importing countries in this group, Bangladesh, Cambodia and Pakistan were able to decrease their net imports over time, with the last two countries even registering export surpluses in some years.

Bangladesh was a net importer for the whole period under consideration. The import surplus of Bangladesh reached its peak in 1988, after fluctuating in the initial years. Since then, the country has progressively decreased its import surpluses.

China had the strongest influence over the agricultural trade balance for these countries.

China's import balance was found to follow a cyclical pattern, with the cycles going through progressively shortened periods. A four-year cycle from 1983 saw a large import surplus turn into an export surplus in 1985. Following this, there was a sharp deterioration in agricultural trade balance ending in an import surplus in 1989. In the subsequent two years, the trade balance turned favourable yet again, but in 1992, there was a drop in the magnitude of surplus. A similar cyclical tendency was seen in India's agricultural trade. The first two years, namely, 1983 and 1984, were marked by a worsening of the export surplus, however, from 1989, the export surplus peaked and although in the terminal year the

surplus had declined, the level it reached was higher than the previous peak reached in 1986.

Sri Lanka and Indonesia showed similar tendencies. Both countries experienced declining export surpluses from the late 1980s.

2. Self-sufficiency in cereals

The relative import dependence of countries in meeting their domestic consumption requirements of food is a key factor that would determine their situation in the future agricultural regime. Dependence on food imports could, in the ultimate analysis, affect the countries' external vulnerability.

Keeping this in view, the following analysis attempts to give some broad indications of the extent to which sample countries have been self-sufficient with respect to wheat and rice. At the outset, it should be mentioned that the database on which the analysis is based has several limitations. Figures for consumption of the two cereals are not available and gross availability has been used as the proxy. The figures thus derived have consequently been used to assess the general direction of self-sufficiency or otherwise as is observed in the low-income food deficit countries. The self-sufficiency ratio, defined here, is taken as the ratio of domestic production to total availability.

Wheat

Table 4 gives the countrywise figures for wheat self-sufficiency ratios during the period 1983-1992. Of the 16 countries in the sample, 8 did not produce any wheat and hence were totally dependent on imports for meeting their consumption requirements. The four small island countries, Maldives, Kiribati, Samoa and Vanuatu belonged to this group. Two other least developed countries, namely, Cambodia and the Lao People's Democratic Republic, and Indonesia and Sri Lanka complete the set of non-wheat producing countries.

From among the four least developed countries, data for which are provided in the table (Myanmar has been excluded because its import data was only partially reported), Bangladesh and Bhutan show very low self-sufficiency levels. In the case of Bhutan, the fall in its degree of self-sufficiency was particularly steep in the second half of the period under consideration. Bangladesh experienced deterioration towards the end of 1980s. However, in the 1990s its level of self-sufficiency improved somewhat.

Table 4. Wheat self-sufficiency ratios

Country/Year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Afghanistan	0.98	0.99	0.98	0.96	0.98	0.89	0.87	0.84	0.92	0.95
Bangladesh	0.42	0.39	0.52	0.47	0.51	0.31	0.32	0.43	0.39	0.45
Bhutan	0.65	0.65	0.67	0.62	0.70	0.44	0.44	0.21	0.25	0.25
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
China	0.87	0.89	0.93	0.93	0.86	0.85	0.85	0.88	0.88	0.90
India	0.93	0.96	1.01	1.00	1.01	0.96	1.00	1.00	1.01	0.95
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kiribati	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lao PDR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maldives	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myanmar	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.83	0.88
Nepal	0.94	1.00	0.97	0.97	0.99	0.95	0.97	1.00	1.00	1.00
Pakistan	0.98	0.99	0.93	0.88	0.97	0.95	0.87	0.87	0.94	0.89
Samoa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sri Lanka	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanuatu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The two remaining least developed countries, Afghanistan and Nepal, were in a relatively better position. Nepal had very high levels of self-sufficiency throughout the period and was experiencing near total sufficiency in wheat in the last three years.

China and Pakistan in particular relatively higher degrees of self-sufficiency.

India, the main wheat exporting country for the period as a whole, could not maintain total sufficiency in the initial and terminal years. In two other years, it was slightly short of meeting its total requirements through domestic production.

Rice

Table 5 gives the figures for rice self-sufficiency ratios as observed across countries for the period from 1983 to 1992. The four small island countries were the only countries who did not produce rice and that had remained completely dependent on imports.

The self-sufficiency ratios given in table 5 indicate that total self-sufficiency was achieved by four countries, China, India, Myanmar and Pakistan. These countries have been net exporters of rice throughout the period considered, hence the observed degree of self-sufficiency.

Five other countries, three of which are least developed countries attained near total self-sufficiency in rice. While Bangladesh and Indonesia improved their levels of self-sufficiency in rice over time, Sri Lanka experienced a deterioration. The Lao People's Democratic Republic and Cambodia managed to maintain their self-sufficiency levels at somewhat less than total sufficiency.

Afghanistan and Bhutan are the countries which suffered the sharpest declines in self-sufficiency. Afghanistan experienced this decline more in the recent past, while Bhutan has been going through this process since 1988.

To sum up, using 1983-1992 as the reference period, the analysis showed that most of the target countries have been large net importers of wheat and rice. The least developed countries, in particular, have faced deterioration in the cereals trade balance.

Table 5. Rice self-sufficiency ratios

Country/Year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Afghanistan	0.98	1.00	1.00	0.99	0.99	1.00	0.99	0.99	1.00	0.80
Bangladesh	0.99	0.99	0.97	1.00	0.99	0.97	1.00	0.99	1.00	1.00
Bhutan	0.88	0.86	0.86	0.88	0.89	0.79	0.81	0.75	0.68	0.66
Cambodia	0.96	0.95	0.97	0.96	0.96	0.96	0.98	0.99	0.99	0.97
China	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00
India	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.00
Indonesia	0.97	0.99	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Kiribati	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lao PDR	0.97	0.97	0.98	0.98	0.98	0.97	0.97	0.98	0.98	0.97
Maldives	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myanmar	1.06	1.05	1.03	1.05	1.04	1.00	1.01	1.02	1.01	1.02
Nepal	0.99	1.00	1.00	1.01	0.99	1.00	1.00	1.00	1.00	1.00
Pakistan	1.22	1.34	1.19	1.34	1.35	1.34	1.21	1.18	1.33	1.49
Samoa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sri Lanka	0.93	0.99	0.94	0.92	0.96	0.93	0.87	0.95	0.95	0.90
Vanuatu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

While most countries, with the exception of the small island countries, were at least near self-sufficiency in rice, the situation was quite the opposite in the case of wheat. Only a few countries were found to be at least near self-sufficiency.

Given this situation of external dependence, it will be shown in the next sections that the low-income net food importing countries do not stand to improve their current situation, particularly with respect to wheat and rice, under the future trading regime unless their production structures can respond favourably.

3. Effects of subsidy-reduction and changes in relative prices

As the low-income developing countries do not subsidize their agricultural sectors as such the implications of subsidy reduction commitments agreed to under the Uruguay Round are expected to affect LIFD countries in that food prices, particularly cereals are expected to increase.

The responsiveness of domestic production to the changes in relative prices is a critical factor for the LIFD countries of the ESCAP region. Two possibilities arise out of the anticipated increases in world prices of agricultural commodities. One, increases in world prices could stimulate domestic production which could in its turn help the food deficit countries to reduce their level of external dependence on foodgrains. The second possibility is the non-responsiveness of production to any such price incentive arising out of structural bottlenecks.

A major limitation in undertaking this exercise is the absence of systematic price data for all commodities and countries included in the study. In view of this limitation, the production efficiencies over the most recent ten-year period for which data were available, were analyzed and inferences were drawn regarding the responsiveness of production to higher prices.

The overall price level in the economy is influenced, therefore, by agricultural prices. However, the intensity of this price linkage depends, *inter alia*, on the nature of the agricultural sector and its input-output relationship with the industrial sector.

Estimates of the elasticity of the domestic prices with respect to the agricultural prices are presented in table 6. The elasticity estimates range from 0.61 for China to 1.32 for Nepal. These results may be interpreted to mean that in China, Indonesia, Sri Lanka and Vanuatu, the inflationary impact of agricultural prices is contained, while in Bangladesh, India,

Nepal and Pakistan, there is some sort of buoyancy of the overall prices. These increase more than proportionally in response to the increase in the agricultural prices in these latter economies. One could draw a broad inference, that countries which have export surplus are able to contain the buoyancy impact of agricultural prices (Vanuatu having import surplus is an exception), while those having import surplus experience the buoyancy effect, with the exception of India. Thus, in the post-Uruguay Round scenario, the continuation or increase in the import surplus in these economies may indicate the possible spread of inflationary impacts on the domestic agricultural prices.

The analysis of the price linkages is further extended by examining the elasticity of the domestic agricultural prices with respect to the international prices. In the absence of the data on the import prices of the agricultural sector we have used the overall import-price faced by each country. The analysis of this price-transmission effect of the international prices, also

Table 6. Impact of agricultural prices on domestic prices: 1971-1991
$(\log (P_D) = \alpha + ß \log(P_A))$

Country	Agricultural Price	Constant	Rbarsqr ($\bar{R}^2$)
Bangladesh	1.06	-0.24	0.984
	35.13	-1.99	
China	0.61	1.82	0.941
	17.90	12.49	
India	1.02	-0.10	0.991
	47.81	-1.15	
Indonesia	0.93	0.36	0.997
	81.99	8.16	
Nepal	1.32	-4.15	0.096
	1.77	-1.13	
Pakistan	1.06	-0.32	0.998
	94.33	-6.67	
Sri Lanka	0.93	0.30	0.991
	46.97	3.88	
Vanuatu	0.69	0.41	0.421
	3.94	0.64	

Source: World Bank, *World Tables 1994.*

Note: P_D and P_A represent domestic prices and agricultural prices (domestic) respectively

reveals interesting results (table 7). The countries which have elasticity greater than one are: Bangladesh (1.71), Pakistan (1.21) and Vanuatu (2.61) while those which have elasticity less than one are China (0.82), India (0.22), Indonesia (0.83), Nepal (0.91) and Sri Lanka (0.41). All the countries in the former group are those which have an import-surplus in agriculture. In the latter group, the equations for India and Sri Lanka are not good fits statistically. China and Indonesia have a large export surplus while Nepal has a moderate import surplus in the agricultural sector. Thus, there could be a broad hypothesis to the effect that the international price transmission effect is subdued in the case of economies with an export-surplus in the agricultural sector, while those economies with import-surpluses in the agricultural sector, face elastic price-transmission effects. It seems that export-orientation in the agricultural sector is a good antidote for containing the adverse impact on the domestic agricultural prices caused by international prices.

Table 7. Impact of international prices on domestic agricultural prices: 1971-1991

$(\log (P_A) = \delta + \gamma \log(P_I))$

Country	Agricultural Price	Constant	Rbarsqr ($\bar{R}^2$)
Bangladesh	1.71	-3.47	0.856
	10.96	-5.12	
China	0.82	0.75	0.687
	6.70	1.42	
India	0.22	3.25	0.224
	2.60	9.17	
Indonesia	0.83	0.10	0.488
	4.48	0.12	
Nepal	0.91	1.02	0.828
	9.87	2.60	
Pakistan	1.21	-1.15	0.860
	11.12	-2.38	
Sri Lanka	0.41	2.02	0.044
	1.38	1.49	
Vanuatu	2.61	-7.84	0.670
	6.46	-4.47	

Source: World Bank, *World Tables* 1994.

Note: P_A and P_I denote domestic agricultural prices and international prices respectively

Table 8 gives the results of combining the two elasticity estimates to derive the elasticity of domestic prices with respect to international prices. There is a clear support for the hypothesis that the countries with an import surplus in agriculture are highly vulnerable to an elastic price-transmission effect from international prices to domestic prices. The economic logic of the chain of causality has to be analyzed with more detailed empirical data. However, the implications of further increases in the import surplus, or that of the possibility of export-surplus countries becoming import surplus countries in the post-Uruguay Round scenario, for the domestic price situation are not at all comfortable. Even a ten per cent increase in the international prices is expected to increase the domestic prices more than proportionately, thereby exacerbating the problems created by the situation of import surplus on the agricultural front.

Table 8. Estimates of elasticities

Country	Status of Agriculture Trade	Elasticity of		
		Domestic Price with respect to Interna-tional Prices	Agriculture Price with respect to Interna-tional Prices	Domestic Price with respect to International Prices
Bangladesh	Import surplus	1.06	1.71	1.81
China	Export surplus	0.61	0.82	0.50
India	Export surplus	1.02	*0.22	0.22
Indonesia	Export surplus	0.93	0.83	0.77
Nepal	Import surplus	1.32	0.91	1.20
Pakistan	Import surplus	1.06	1.21	1.28
Sri Lanka	Export surplus	0.93	*0.41	0.38
Vanuatu	Import surplus	0.69	2.61	1.80

4. Prospects for domestic production and the imperatives for change

Production and yield trends observed in the sample countries between 1983 and 1992 point to an overall tendency towards low growth and stagnancy. Most least developed countries experienced low or negative growth rates, in both production and yield, in wheat and rice. More importantly, these low and negative growth rates were accompanied by a high degree of instability.

It is clearly evident that the foodgrains producing subsector in the sample countries is suffering from structural rigidities, which would

appear as an impediment as these countries try to take advantage of the higher global prices that are expected in future. Thus, instead of improving their situation through favourable responses of domestic production to price changes, the countries face the prospects of deterioration in their balance of payments resulting from higher import prices of grains. The magnitude of the deterioration is not possible to predict given the limitations of the data.

Production performance of the sample countries in crops other than cereals was somewhat better. The least developed countries, too, performed better in the production of the non-cereal crops. Horticulture was one area in which all the least developed countries, with the exception of the Pacific island countries and Myanmar, appear to have better prospects, given the favourable yield and production rates observed in the recent past.

However, for the growth prospects to be translated into additional exports, the sample countries would require to focus on the preservation and processing facilities that exist domestically. Developing these facilities should be taken as one of the imperatives in the proposed agricultural regime.

While the emphasis on the food processing sector is in order, appropriate measures should also be taken to improve the efficiency of foodgrain production. This is particularly necessary in countries having very large domestic demand that cannot remain dependent on the external market without facing a serious balance-of-payments crisis. These countries should, therefore, use the food processing sector to the extent it helps them earn additional foreign exchange to cover their food import bill.

5. Implications of specific provisions in the Uruguay Round agreements

Critical issues among the provisions from the point of view of their impact on the countries considered in the study are discussed below. These include: (a) the minimum access opportunities for imports that need to be established in case a country does not carry out tariffication of non-tariff barriers; (b) the adoption of sanitary and phytosanitary measures; (c) the limits on the functioning of the public distribution system (PDS) imposed by the agreements, and (d) the extension of intellectual property protection to the agricultural sector.

(a) Minimum access opportunities for imports

While tariffication of non-tariff barriers has generally been proposed as an integral part of the Uruguay Round agreements, certain exceptions are provided in the Agreement on Agriculture. In the event of a country not complying with the requirements of tarifficiation, they would have to establish minimum access opportunities for imports as laid down in annex 5 of the Agreement. The binding commitment for establishing minimum import access opportunities in the case of primary agricultural products, where imports were less than 3 per cent of consumption between 1986 and 1988,[1] would be felt by several countries which have been marginal importers. Tables 9 and 10 below provide broad indications of the nature of import dependence in different countries in wheat and rice. In the absence of data on consumption, total availability (production plus net imports) is used as the proxy.

Table 9. Ratio of imports to availability of wheat

Countries	1986	1987	1988	1986-1988 (average)
Afghanistan	3.5	2.0	10.7	5.4
Bangladesh	52.7	49.2	69.0	57.0
Bhutan	38.5	29.6	55.6	41.2
Cambodia	..	..	..	..
China	7.3	14.1	15.5	12.3
India	0.0	0.0	3.7	1.2
Indonesia	100.0	100.0	100.0	100.0
Kiribati	100.0	100.0	100.0	100.0
Lao People's Democratic Republic	100.0	100.0	100.0	100.0
Maldives	100.0	100.0	100.0	100.0
Myanmar	..	..	..	..
Nepal	5.6	3.2	4.7	4.5
Pakistan	12.1	3.0	4.5	6.5
Samoa	100.0	100.0	100.0	100.0
Sri Lanka	100.0	100.0	100.0	100.0
Vanuatu	100.0	100.0	100.0	100.0

1 The minimum access opportunities to be established are as follows:

(1) 1 per cent of the base year consumption for the commodity that is the predominant staple in the traditional diet of a devleoping country member in the first year of implementation of the Agreement, thich is to increase to 2 per cent at the beginning of the fifth year and further to 4 per cent at the beginning of the tenth year.

(2) 4 per cent of the base year consumption of all other primary agricultural commodities to begin with and increasing to 8 per cent at the beginning of the fifth year.

Table 10 shows that in case of rice, 9 out of the 16 countries in the sample had average imports less than 3 per cent of the total availability between 1986 and 1988. Of these nine countries, five belong to the category of the least developed countries. In the case of wheat, India is the only country whose average imports were less than 3 per cent of total availability.

Table 10. Ratio of imports to availability of rice

Countries	1986	1987	1988	1986-1988 (average)
Afghanistan	0.7	1.1	0.3	0.7
Bangladesh	0.2	1.2	2.8	1.4
Bhutan	12.0	10.5	21.2	14.6
Cambodia	3.8	4.5	4.2	4.2
China	0.2	0.3	0.2	0.2
India	0.0	0.0	0.5	0.2
Indonesia	0.1	0.1	0.1	0.1
Kiribati	100.0	100.0	100.0	100.0
Lao People's Democratic Republic	1.6	1.8	3.4	2.3
Maldives	100.0	100.0	100.0	100.0
Myanmar	0.0	0.0	0.0	0.0
Nepal	0.2	1.2	0.3	0.6
Pakistan	0.0	0.0	0.0	0.0
Samoa	100.0	100.0	100.0	100.0
Sri Lanka	7.5	3.6	7.3	6.1
Vanuatu	100.0	100.0	100.0	100.0

The immediate implication of the provision on minimum access opportunities is that it seeks to undermine the basis of self-sufficiency in foodgrains which has been the cornerstone of planning in the agricultural sector of several developing countries. For all these countries, establishment of minimum access opportunities, and the consequent increase in imports, would imply tremendous strain on their fledgling balance of payments. Although the new GATT agreement allows developing countries to impose import controls for balance-of-payments reasons, the weakened nature of the provision, as compared to the existing Article XVIII:B may limit the use of this provision. What the developing countries have to contend with in this context are the stronger mechanisms of balance-of-payments consultations that the Uruguay Round agreements provide and which do not allow use of import controls as easily as could be done in the past.

One could, however, argue that if imports become mandatory, part of the domestic production would be released as surplus for exports. But access to export markets does not appear to be all that easy as is discussed below.

(b) Implications of sanitary and phytosanitary measures

The Agreement on Sanitary and Phytosanitary Measures, which is designed to introduce harmonized health and safety codes could have a major bearing on the exports from the developing countries. The enhanced standards of sanitary and phytosanitary regulations could become a serious non-tariff barrier for exports from the developing countries, since most of these countries do not follow any such standards. The possibilities of market access for developing countries could as a result be seriously impaired by such explicit non-tariff barriers that the Agreement on Sanitary and Phytosanitary measures could bring forth. This clause is particularly relevant for the net-food importing countries which have the possibilities of decreasing the adverse implications arising out of food imports by exporting some other commodities.

It is a recognized fact that agricultural practices in developing countries in general pay little consideration to the level of residual chemicals which remain in the produce. Health and safety standards are almost non-existent which is in sharp contrast to the very rigid standards that the developed countries have been adopting. This implies that while agricultural products from developing countries may be price competitive in the global markets, these products may not be able to gain market access in the large developed country markets on account of non-compliance with the health and safety standards.

The adoption of the international standards in health and safety regulations thus appear as *sine qua non* for increased exports from developing countries. Adoption of such standards would be particularly necessary in the sample countries which try to reduce the adverse impact that they could face arising out of larger food import bills.

(c) Public distribution system

In most of the low-income countries, governments have taken special initiatives for establishing institutional mechanisms for providing foodgrains at subsidized rates. Food corporations are established as public sector undertakings and foodgrains are purchased from the farmers at administered prices and distributed to the consumers at the subsidized rates. The difference between the cost of procurement and the value of

subsidized sale is regarded as a subsidy to the consumers, and this subsidy is shown as budgetary support to the public sector undertaking. The "ration cards" giving eligibility for purchase at subsidized rates are given to almost all the citizens. The Agreement on Agriculture has mandated the restriction of the public distribution system to the rural and the urban poor (annex 2). This may imply radical restructuring of the institutional mechanism of the public distribution system to make it target-group oriented. While this reform is welcome in itself, the question is who will determine the criteria for identifying the rural and the urban poor. The level of poverty cannot be related only to the level of nutritional intake and it has to be defined in terms of overall purchasing power and income criteria.

The low income countries and the least developed countries should evolve suitable forums for exchanging information on the nature of the public distribution system existing in each country and for discussing ways and means of making it target-oriented and more efficient.

(d) Effect of the introduction of intellectual property protection

The introduction of intellectual property in agriculture, a key element of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs), is one of the major challenges that developing countries have to face. TRIPs seeks to strengthen the rights of the commercial plant breeders, usually the large multinational seed companies, by committing countries to introduce a system of patenting or an effective *sui generis* system for the protection of improved varieties of plants. In so doing, proprietary rights are sought to be extended over biogenetic resources which until not so long ago was considered to be common heritage of humankind.

Developing countries face challenging prospects under the conditions stipulated under the Agreement on TRIPs. Although they have been the depositories of the entire bio-genetic resources of the earth, they no longer hold that position owing to severe erosion in their biodiversity. A commonly held view is that multinational corporations have contributed to this process of erosion of bio-genetic resources in developing countries. These corporations, through their expertise in bio-technology, have developed new varieties of plants improved existing varieties and sold them on international markets at high prices. The introduction of such new varieties of plants has wiped out the cultivation of the traditional varieties, causing considerable damage to agrarian economies in developing countries arising from the consequent loss of biodiversity. In Indonesia, for instance, about 70 traditional varieties of rice have been now replaced by four so-called improved varieties.

Extending intellectual property protection to agriculture would be a matter of great concern to net food importing countries of the region particularly because of the nature of rights that the commercial plant breeders would be able to enjoy in the new regime. As discussed earlier, the structural characteristics of the farm sector in the countries referred to in the study are weak with low yield rates and fluctuating production levels. Under these circumstances the countries would have to seek recourse to the adoption of improved varieties of planting material to overcome their structural problems. But with the introduction of plant breeders rights, countries would face problems on two counts. One, the cost of the planting material would be much higher owing to the monopoly prices that would now be charged by the companies supplying the improved varieties, and two, the breeders would be able to impose restrictions on the re-use of the planting material in the exercise of their rights.

This restriction on the re-use of planting material is provided in the *sui genesis* system of protection that is provided for in the UPOV Convention, as amended in 1991. While the existing framework provided by the UPOV Convention, i.e., UPOV 1978, allows farmers to re-use the protected planting material, making an exception of the breeders' rights, the amended version to be enforced after 1995, does not allow this exception to the farmer.

Countries may have the option of choosing one or the other UPOV, as provided for in the GATT agreement on TRIPs, but there are many pertinent questions here that are relevant for the net food-importing countries: Would the farmers be "allowed" to continue with their traditional system of exchanging their seeds in a barter system or would it be regarded as a violation of the plant breeders' rights? With the emergence of seed cultivation and seed-sales as commercial activities, would the cost of seeds and hence the cost of cultivation increase radically? How could these resource – poor countries internalize the value addition of the seed-sale activities by setting up their own seed companies – possibly as joint ventures with multinational seed companies? What type of mechanism could be devised for international surveillance and enforcement of discipline for the unfair business practices of the multinational seed companies?

In addition to the above-mentioned problems that might arise, formulating an "effective" *sui generis* system, as required under the TRIPs Agreement, and the rigorous implementation of it, require high level expertise at the governmental level and also in the private sector. The plight of the bio-diversity rich developing countries is further deepend by the fact that the task of identifying the bio-diversity is itself immense and not within the resource capability of their Governments. It is here that cooperation

among the developing countries and effective support from multilateral bodies is called for.

Moreover, a more fundamental problem facing the target countries is the manner in which they could improve their capacities in carrying out biotechnological research which at the present juncture, is hardly adequate. In addition, with a view to taking the maximum advantage of their bio-diversity assets, developing countries have taken decisions – in the G-15 forums and elsewhere – to establish a GENE BANK which would protect their germplasms and make them available for bio-technological research by their national scientists. The basic objective of a GENE BANK is to take commercial advantage of their genetic wealth while the present system makes the genetic varieties freely available to the multinationals who exploit them to secure high profits. The task of making these GENE BANKS operational requires a high level of technical expertise. While the imperatives of setting up a GENE BANK and adopting similar supporting measures are very clear as a response to the post-Uruguay Round trading system, the developing countries need to pool their own scientific and technical expertise, draw from the expertise of the developed countries, receive support from the multilateral bodies such as FAO, WIPO, and even the GATT forum to enable themselves to formulate and implement these institutional measures to safeguard their national interests.

A similar set of problems as discussed in the preceding paragraphs could arise as food-deficit countries try to initiate processes to improve their yield rates by the increased use of agro-chemicals. All these inputs have come under the purview of TRIPs. It is envisaged that the countries which have not enforced a product patent regime, would be required to give exclusive marketing rights for five years to those who have patent rights in agro-chemicals immediately upon the enforcement of the Agreement. Exclusive marketing rights would obviously mean an increase in the domestic prices of these agro-chemicals and hence an increase in costs. Of course the incidence of this increase in costs depends upon various other factors and it is a matter for further study at the micro-level.

The least developed countries are exempt from the implementation of the various provisions of the TRIPs agreement. However, they are required to conform to the principle of national treatment, most favoured nation treatment and WIPO discipline in their response to the operations of multinational companies dealing with agro-chemicals, including fertilizers. The implications of all this might mean increases in the cost of inputs which are so crucial for the improvement of yield in agriculture, horticulture and related activities. More micro-level research studies are required to

understand the quantitative linkage between the level of input costs and the implementation of these provisions.

6. Challenges posed by the World Trade Organization

Two issues are critical for the developing countries as the newly formed World Trade Organization (WTO) comes into being. The first is the capacity of each country to understand the structure and so function effectively in the new organization and the second is its ability to re-orient the domestic legal system so as to make it compatible with the requirements of WTO.

The structure of WTO is designed to be a unique multilateral body equipped with a comprehensive mandate for the implementation of the provisions of the various agreements of the Uruguay Round Final Act. WTO is a well structured body with various councils and committees designed to provide support to the decision-making process. There are three councils, namely, Council of Trade in Goods, Council of Trade in Services and Council of Intellectual Property Rights. These Councils would be at the ministerial level and they are supported by various committees at the experts/official level. The agricultural goods trade would come under the purview of the Council of Trade in Goods, whereas some of the services related to the agricultural sector, such as those concerned with banking, insurance, rural credit, etc., would come under the Council of Trade in Services. Furthermore, any major investment by the multinationals in the agricultural sector would be covered by the agreement on trade-related investment measures. The question of patents and plant breeders rights, etc., would be covered under the agreement on TRIPs. There would be a Committee on Agriculture, which would deal with the issues related to the agricultural sector before they are taken up by the respective Councils. Perhaps, it would be this Committee on Agriculture which would decide on the status of a country with regard to its balance-of-payment conditions, its eligibility to adopt quantitative restrictions for balance-of-payments reasons, market-access provisions, domestic and export subsidy reduction commitments, etc. It is in this Committee that the representatives of the different countries will be engaged in technical discussions and hard bargaining. Participation in the deliberations of these Committees is a great challenge for the developing countries and especially for the least developed countries. While, it is not possible at this stage to list all the possible situations that might arise in the meetings of these Committees and Councils, it is obvious that the member countries will have to equip themselves for effective participation in these meetings. In this context, the net food-importing countries which have some common

concerns could establish closer linkages among themselves and prepare common strategies for deliberations in these meetings. A number of analytical questions arise. Has any country estimated its aggregate measure of support properly? Has it taken full advantage of the exemptions that are available for the developing countries/least developed countries? Can it establish that some exporting countries are dumping goods in domestic markets? What are the analytical criteria for deciding as to whether the country is in a balance-of-payment difficulty? In short, participation in the decision-makingprocess of the new multilateral institution, namely, WTO, is itself a great challenge which is common to most developing countries but which is of special significance to net food-importing economies.

Another challenge open to the developing countries in general and to the net food-importing countries in particular, is that of streamlining the domestic legal system to suit the imperatives of the new trading disciplines. The Agreement on Agriculture, TRIPs, Services, etc., contain many legal provisions. In many situations, the burden of proof of violating a provision is thrown upon the party which is charged as the violator. For instance, if the farmer is selling part of his previous years harvest as seed to a neighbour, and is charged by a seed company that he has violated the plant breeders rights, the onus of disproving the charge falls on the farmer. Many such situations may arise in the disputes concerned with the provisions of the sanitary and the phyto-sanitary agreements. Members who are committed to the process of reductions on export subsidies will have to establish that the quantity exported in excess of the reduction commitment level is not subsidized. Thus, the Uruguay Round agreements with multiple provisions of commitments, and enforcement of disciplines requires continued support of the legal system of a country. Formulation of a *sui generis* protection system for plant varieties and the formulation of rigorous anti-dumping rules are all exercises requiring legal expertise. Since the food sector is a sector of strategic importance in the food deficit countries, they have to restructure their domestic legal system in a manner which will give them maximum preparedness for the various provisions of the Uruguay Round agreements. In this context, the legal and the technical expertise available in these countries may not be adequate for the tasks and the challenges before them. At different occasions in the Final Act, developed countries are urged to come forward with support and provide assistance to the developing countries in formulating their legal system for intellectual property rights and other issues. However, it may be preferable for the countries of the region to evolve a forum for the mutual exchange of expertise and information and work out suitable modifications in their legal system with each others help.

7. Conclusion

The discussion indicates quite clearly that the future agricultural regime implies many challenges and opportunities for the food deficit countries included in the study. The domestic production structures in these countries are not productive enough and consequently the past trends of import dependence as observed in the case of most countries, and particularly the least developed countries, are likely to be re-inforced. In addition, several countries would face inimical consequences of having to comply with the market access provisions and the strong health and safety regulations.

Several measures are, therefore, necessary in order for these countries to face the challenges of the proposed regime.

Appendix I. Sample countries and their main characteristics

Countries	Population (millions)	Per capita (GDP US$)	Share of agriculture in GDP	
			1970	1992
Afghanistan	17.7	485	NA	NA
Bangladesh	114.4	220	55	34
Bhutan	1.5	190	NA	42
Cambodia	8.6	200	NA	NA
China	1,162.2	370	NA	27
India	883.6	330	45	32
Indonesia	184.3	610	45	19
Kiribati	0.1	493	NA	NA
Lao People's Democratic Republic	4.4	220	NA	NA
Maldives	0.2	470	NA	NA
Myanmar	42.7	655	NA	NA
Nepal	19.9	180	67	52
Pakistan	119.3	400	37	27
Samoa	0.2	960	NA	NA
Sri Lanka	17.4	500	28	26
Vanuatu	0.2	1,180	NA	NA

Sources: World Bank, *World Development Report* (1994); United Nations Conference on Trade and Development (UNCTAD), *The Least-Developed Countries: 1993-94 Report*; and United Nations Development Programme (UNDP), *Human Development Report 1994*.

F. POLICY RECOMMENDATIONS

The challenges that the food deficit countries are likely to face in the post-Uruguay Round agricultural trading regime require initiatives at two levels. Specific action plans need to be devised to meet the short-term imperatives, arising out of food shortage while a second set of initiatives require a longer-term view.

The proposed reform in agricultural policies of developed countries raises the possibility of a decrease in the levels of food surpluses. A sizeable proportion of the food surpluses that are currently available have been contributed by the countries in which the present levels of subsidy are high. Pruning the levels of subsidy in these countries could, therefore, affect the availability of surpluses in the world market.

The squeeze on the food surpluses in the world market would require immediate action for better management of the available food stocks and ensuring that the food deficit countries, particularly the least developed countries have preferential access to them. The Uruguay Round agreements recognize that measures need to be taken for ameliorating the adverse impact of the reform of agricultural policies on the least developed countries. The agreements include a Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least Developed and Net Food-Importing Developing Countries, which specify certain instrumentalities that need to be developed to address the problem.

This Decision provides a periodic review of the level of food aid established by the Committee on Food Aid under the Food Aid Convention 1986 and the initiation of negotiations in an appropriate forum to establish a level of food aid commitments sufficient to meet the legitimate needs of the developing countries during the reform programme. The Decision further provides for an increasing proportion of basic foodstuffs to be provided to the least developed countries and net food-importing developing countries fully in grant form or in line with Article IV of the Food Aid Convention 1986. In order to meet the needs of the countries facing short-term difficulties in financing normal levels of commercial imports, the Decision makes provision for these countries to draw on the resources of international financial institutions under existing facilities or through the establishment of new facilities. The translation of the provisions of the "Decision" into operational strategies is the critical component and in this respect the "Decision" provides few leads. The financing package would be from the International Monetary Fund and the Bank and would be

subject to certain conditionalities, an apprehension that has been expressed recently by FAO.[1]

Fresh initiatives are thus required to ensure that the food-deficit countries obtain real benefits from the instruments adopted following the Uruguay Round of multilateral trade negotiations.

Public stockholding of grains for food security has been allowed under the Uruguay Round Agreement on Agriculture under very restrictive conditions. Countries have been allowed to maintain food stocks corresponding to predetermined levels related to food security. But more critical than the conditions are the availability of financial resources required for maintaining such food stocks. With the Governments in all developing countries facing a resource crunch, the capacity of grain stockholding by individual countries has become limited. A way out of this problem may be found in regional stockholding of grains. The ESCAP region offers immense possibilities of developing a regional store-house, given the fact that a number of major exporting countries exist in this region. In order to operationalize this, a regional financial facility can be created, either as an independent organization, or as a part of the existing multilateral funding agencies such as the Asian Development Bank. This facility can besides supporting regional initiatives, provide assistance to the least developed countries.

Over and above these short-term measures, longer-term measures need to be adopted for the development of the agricultural sector in the LIFD countries. This is an area where potential exists for increasing regional cooperation. The large countries such as China, India and Indonesia, and the agricultural exporters in the ESCAP region, have developed considerable expertise in agricultural technology which can be transferred to the least developed countries.

Specific measures proposed for food deficit countries to meet the challenges arising out of the proposed regime are as follows:

(a) An increase in the capacity of the countries to earn additional foreign exchange by developing the food processing sector. This would facilitate export of products with higher value added;

(b) Provisions for the adoption of sanitary and phytosanitary standards proposed in the Agreement. This should include

1 Food and Agriculture Organization of the United Nations, *The Uruguay Round Agreement and its Implications for Food Security*, CFS:94/Int. 5, March 1994, p.6.

mechanisms for creating awareness among the small farmers for adherence to the proposed health and safety standards. The food processing sector would also need to adjust to meet the strict regulatory codes;

(c) New varieties of crops need to be adopted to improve yields. Several countries in the region have developed such improved varieties, and this expertise needs to be channelled into the development of agriculture in the region;

(d) Establishment of regional gene banks to preserve the genetic diversity of the region;

(e) The intellectual property system to be adopted in respect of the improved varieties of plants and seeds needs to have specific provisions which protect the interests of the small farmers in the target countries. Additionally, the interests of these countries as providers of vital germplasms should be safeguarded through a legal instrument;

(f) Research and extension services can be developed in the countries lacking effective mechanisms in this area through enhanced regional cooperation. This is another area where the relatively advanced countries can extend their expertise to other countries in the region;

(g) Effective institutional support for strengthening agriculture in the region needs to be put in place. This requires, apart from the financial support mentioned earlier, facilities for monitoring progress in the least developed countries;

(h) Sample countries would need to develop WTO-consistent instruments to protect their interests in several specific areas. Among the more important areas are laws pertaining to anti-dumping, which are non-existent in most countries that are included in the study;

(i) The low income countries need to evolve suitable forums for exchanging information on the nature of the public distribution system in the future agricultural regime that would be WTO-legal, so as to take concrete measures to formalize an effective system;

(j) Effective mechanisms which enable the smaller countries to have a reasonable say in the negotiating process of the WTO need to be evolved.

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V. IMPLICATIONS FOR FOOD SECURITY IN THE ASIAN AND PACIFIC REGION

by

Commodities and Trade Division
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy

CONTENTS

A. INTRODUCTION

The Final Act of the Uruguay Round of multilateral trade negotiations, signed at Marrakesh in April 1994, is now at its implementation stage. As of January this year, the World Trade Organization (WTO), the successor to General Agreement on Tariffs and Trade (GATT), is charged with the implementation of the various agreements encompassed in the Final Act. The Agreement on Agriculture is prominent among them. This is so not only because it is the first time that agriculture has been included in a multilaterally negotiated treaty but more importantly because agriculture is such an important sector in the economies of many countries and more fundamentally because agriculture is the provider of the basic needs of people. Therefore, how agriculture may be affected by the Uruguay Round is not simply a question of export earnings and market shares alone but more basically a food security question, especially for the developing countries.

From the beginning of the Uruguay Round of multilateral trade negotiations, and even much earlier than that, there have been divergent views on the impact of trade liberalization on agriculture and food security, in particular.[1] These assessments were based on hypothesized scenarios of trade liberalization and it was only since April 1994, when the individual country concessions became available, that more realistic assessments could be made. Furthermore, it is not only the quantifiable effects that are of relevance to agriculture and food security but, perhaps more importantly, the non-quantifiable effects relating to the new environment affecting both trade and domestic agricultural and food security policy.

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1 See, for example, a survey on food security implications of trade liberalization in *Impact on World Food Security of Agricultural Policies in Industrialized Countries*, CFS 87/3, (Rome, FAO, February 1987). Early and more recent quantitative assessments of trade liberalization include, *inter alia* Valde's, A. and J. Zietz, *Agricultrual Protection in OECD Countries: its Cost to Less-Developed Countries*, IFPRI Rep. No. 21, (Washington, D.C., 1986); R. Tyers, and K. Anderson, "Distortions in World Food Markets: A Quantitative Assessment", background paper No. 22, Prepared for the World Bank's *Wold Development Report 1986*, (Washington, D.C., 1986); UNCTAD/ WIDER, *Agricultural Trade Liberalization in the Uruguay Round; Implications for Developing Countries*, (United Nations, New York, 1990); S. Page, with M. Davenport and A. Hewit, *The GATT Uruguay Round: Effects on Developing Countries*, (Overseas Development Institute, London, 1991); Brandao, A.S.P. and W.J. Martin, "Implications of Agricultural Trade Liberalization for the Developing Countries", *Agricultural Economics* 8, 313-343, 1993; Goldin, E., O Knudsen and D. van der Mensbrugghe, *Trade Liberalization: Global Economic Implications*, (Paris, OECD and the World Bank, 1993).

These two dimensions of the impact of the Uruguay Round, i.e., the quantifiable effects which span the short- to medium-term horizon of the implementation of the specific country commitments, and the longer term effects on policy, which go well beyond this horizon, define broadly the scope of this Chapter. Specifically, section B reviews briefly the provisions of the Agreement on Agriculture. Section C highlights the short- to medium-term impact of the Agreement on world food security focusing in particular on the Asian and Pacific region. The implications of the Agreement on food security policy are discussed in Section D, while the last section includes some policy recommendations for the short and long term.

B. BRIEF REVIEW OF THE AGREEMENT ON AGRICULTURE

The implementation of the Agreement on Agriculture (hereafter referred to as the Agreement) starts in 1995, and the reduction commitments of the developed countries should be completed within six years, i.e., by the year 2000, whereas the commitments of the developing countries should be completed within ten years, by the year 2004. The least developed countries are not required to make any reductions. The Agreement addresses three broad areas: market access, domestic support and export subsidies.

There are three elements in the commitment on market access: tariffication, tariff reduction and access opportunities. Tariffication means that specific non-tariff barriers (quotas, variable levies, minimum import prices, discretionary licensing, state trading measures, voluntary restraint agreements and similar border measures) need to be abolished and converted into an equivalent tariff. Ordinary tariffs, including those resulting from tariffication, are to be reduced by an average of 36 per cent (24 per cent by developing countries), with a minimum rate of reduction of 15 per cent for each tariff item. Special safeguard provisions allow the imposition of additional duties when there are either import surges or particularly low prices (both compared with 1986-1988 levels). Where there are no significant imports, minimum access equal to 3 per cent of domestic consumption in 1986-1988 will be established for 1995 rising to 5 per cent of base year consumption at the end of the implementation period.

For domestic support policies, subject to reduction commitments, the total support given in 1986-1988, measured by the total aggregate measure of support (Total AMS)[2], should be reduced by about 20 per cent

2 Total AMS means the annual level of support provided for agricultural products or non-product-specific support provided in favour of agricultural producers in general other than support provided under exempt programmes (for example, Green Box).

in developed countries (13.3 per cent in developing countries). Reduction commitments refer to total levels of support and not to individual commodities. Policies which amount to a small percentage transfer value to producers (less than 5 per cent of the value of production for developed countries, less than 10 per cent for developing countries) are excluded under the *de minimis* rule. Policies which have minimal or no effect on production or trade distorting effects (Green Box) are excluded. The list of exempted Green Box policies includes such policies as general services to agriculture, food security stocks, domestic food aid, and certain decoupled payments to producers, including direct payments to production-limiting programmes, provided certain conditions are met. Policies which meet certain criteria of decoupled support together with production restraint have also been excluded.

Perhaps the most important provision is the commitment to reduce export subsidies. The volume of exports benefiting from such subsidies must be reduced by 21 per cent and the expenditure on export subsidies by 36 per cent. Unlike the reduction commitments in market access and domestic support, reductions in export subsidies will be implemented on a product-specific basis. However, exporters have in certain cases been allowed to maintain a higher level of subsidized exports in the years up to 1999, by availing themselves of a special option (the higher of the subsidized levels of 1991-1992 and 1986-1990) from which to make reductions to the same final level by the year 2000. The Agreement also has some provisions for the prevention of circumvention of export subsidy commitments, including *inter alia* disciplines on the use of export credit and credit guarantees as well as food aid (i.e., food aid should not be tied, it should be carried out in accordance with the *Food and Agriculture Organization of the United Nations (FAO) Principles of Surplus Disposal*,[3] and it should be provided to the extent possible in fully grant form).

The Agreement, although rather comprehensive and going well beyond tariffs and border measures, still represents only a partial liberalization agreement. The quantitative cuts in support to agriculture are relatively small and spread over a number of years. Overall, a large degree of distortion in the world market of agricultural commodities will still remain even after the complete implementation of the reduction commitments. However, the dimensions of the commitments are still impressive. Aggregate domestic support will be cut from $198 billion to $162 billion, export subsidies will be cut from $21.3 billion to $13.8 billion. Virtually all

3 *Principles of Surplus Disposal and Consultative Obligations of member States*, 3rd ed. (Rome, 1992).

agricultural tariffs will in future be bound, i.e., ceiling rates have been established, which adds greater security to trade.

C. IMPACT ON WORLD FOOD SECURITY WITH EMPHASIS ON THE ASIAN AND PACIFIC REGION

This section draws from the results of a just completed quantitative assessment by FAO of the effects of the Uruguay Round[4] on the market of the major agricultural commodities, to be presented, *inter alia*, to the next meeting of the FAO Committee on Commodity Problems (CCP) and the Committee on World Food Security (CFS) in April 1995. After a brief note on the methodology used in the FAO assessment, the effect of the Uruguay Round on food security is analyzed under four main headings: effect on world price levels, effect on agricultural output and on the level of food consumption, effect on trade flows and trade balances, and effect on market stability.

1. Methodology

The assessment was largely based on the World Food Model (WFM) which covers all commodities in the cereals/livestock/oilseeds complex disaggregated into 147 individual countries or country groups. For commodities outside the WFM, single-commodity models were developed. In all cases the models simultaneously determine production, consumption, imports, exports and world prices.

The approach to the assessment was to compare the outcome in the year 2000 in the absence of the Uruguay Round ("Baseline 2000")[5] with the outcome incorporating Uruguay Round provisions ("Uruguay Round 2000"). Projections to the year 2000 are driven by income growth, productivity changes and demographic trends. Income is exogenous to the model. GATT has made a number of estimates on the effect of the Uruguay Round on income growth, ranging from gains of $109 to $510 billion[6]. The World Bank/Organization for Economic Co-operation and Development

4 Food and Agriculture Organization of the United Nations, *Impact of the Uruguay Round on Agriculture*, (CCP: 95/13, Rome, January 1995).

5 Food and the Agriculture Organization of the United Nations, *medium-term Prospects for Agricultural Commodities: Projectsions to the Year 2000*, Economic and Social Development Paper No. 120, (Rome, 1994).

6 The General Agreement on Tariffs and Trade, *The Results of the Uruguay Round of Multilateral Trade Negotiations*, (Geneva, November 1994).

(OECD) has estimated gains of around $213 billion[7]. For the purposes of the FAO study the World Bank/OECD figure was taken for the main scenario while double this amount was taken for the higher income assumption. However, it must be noted that the assumed effect is well below one year's growth in world income.

Prices in each country are linked to world market prices by tariffs and other policy effects and natural forms of protection. For the "Uruguay Round 2000" scenario, the reduction in tariffs changes these price linkages. The modelling has been done in terms of the primary commodity (for example, wheat) so that the tariff changes for the derived products (for example, wheat flour) have been aggregated into an average wheat-equivalent tariff. It has usually been assumed that tariff changes will reflect changes in the bound, ceiling, tariffs. The reduction in export subsidies has been reflected in an increase in the consumer price of the recipient country in addition to any change in world prices owing to trade liberalization. Minimum access has been introduced in those cases where the model did not generate a sufficient volume of imports to meet the national commitments. The value of trade has been calculated by multiplying the volume of trade by an estimated world average export unit price for the year 2000, which in turn was projected as the product of the index of world prices and the base year export unit value. Adjustments were made to take into account the decline in export subsidies and to some extent the loss of preferential margins.

2. World price levels

The projected equilibrium prices in the world market of main agricultural and food commodities in the year 2000 are shown in table 1. The overall price changes shown are the result of two effects: that which would have taken place even without the Uruguay Round (baseline run) and that which is due to the Uruguay Round (figure 1). The price change attributable to the Uruguay Round turns out to be positive for all commodities, in view of the expected slight boost in trade, and is in the neighbourhood of 4 to 11 per cent. The effect, although small, is sufficient to reverse a projected price decline for some commodities, under the baseline run.

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7 I. Goldin, O. Knudsen and D. van der Mensbrugghe, *Trade Liberalization: Global Economic Implications*, (Organization for Economic Co-operation and Development and World Bank, 1993).

Table 1. Change in world food prices by the year 2000

	Baseline (2000)	Uruguay Round (2000)	Total (2000)
		(1987-1989=100)	
Wheat	- 3	+ 7	+ 4
Rice	+ 7	+ 8	+15
Maize	+ 3	+ 4	+ 7
Millet/Sorghum	+ 5	+ 5	+10
Other grains	- 2	+ 7	+ 5
Fats and oils	- 4	+ 4	0
Oilmeal proteins	+ 3	0	+ 3
Bovine meat	+ 6	+ 8	+14
Sheep meat	+ 3	+10	+13
Pigmeat	+13	+11	+24
Poultry	+ 5	+ 9	+14
Milk	+33	+ 8	+41

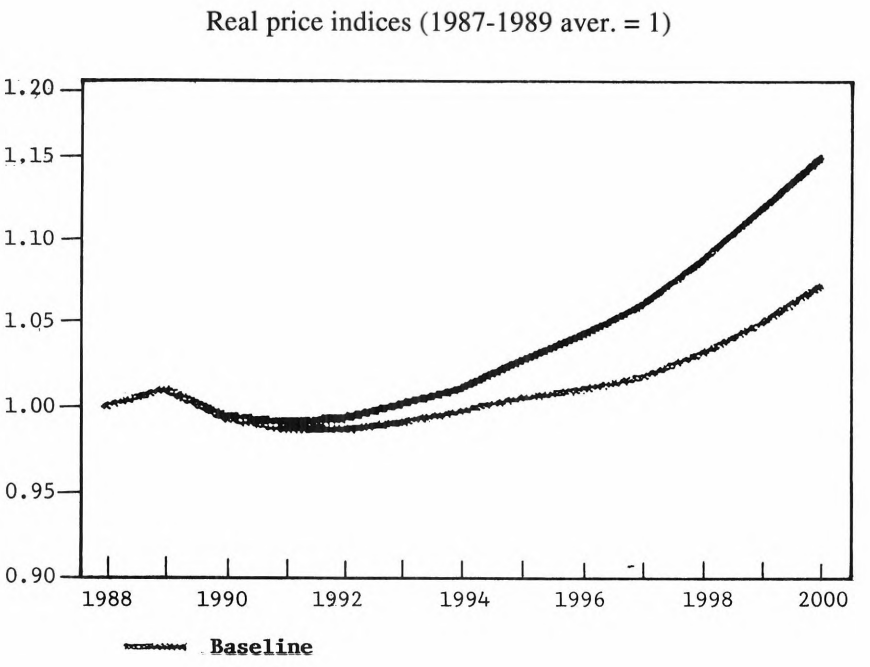


Figure I. Rice world price changes, baseline and Uruguay Round runs

3. Production and consumption of food

The outlook for the agricultural commodities covered in the FAO study is still for a slow-down in growth rates in output compared with the 1980s, even after all the ongoing trade liberalization efforts are implemented (table 2). The Uruguay Round effect on aggregate production at the global level is in fact negligible. Aggregate output is projected to grow at 1.6 per cent a year from 1988[8] to 2000 in the baseline run and that growth rate remains the same under the Uruguay Round run. This compares with a growth rate of 2.2 per cent a year during the 1978-1988 period. Within food commodities, the slow-down in global output is greater for wheat and rice, meat (other than bovine), and dairy products. As regards other commodities, the slow-down is greater for coffee and cocoa. However, some gains are envisaged *vis-à-vis* past growth rates in the global output of coarse grains, tea, sugar and bananas.

The situation in the developing countries follows that of the global trends with notable exceptions: their production of meat, especially bovine meat, is projected to grow at about 3 per cent a year, exceeding that of the past by one percentage point. For the developing countries as a whole, growth in the output of the principal food commodities, at 3.2 per cent, would exceed that of population resulting in some further gains in per capita food consumption, of about 18 per cent for the low-income food-deficit (LIFD) countries as a whole (table 3). However, such gains are not strictly due to the Uruguay Round, although it is not certain if they would have materialized had a failure to reach an agreement led to a global economic depression, as some had predicted.

The gain in per capita consumption for the LIFD countries of the region by the year 2000 is projected to be the highest among all developing regions, at about 24 per cent. However, this impressive gain of the region as a whole is not shared equally among countries, even though a degree of caution regarding the quality of individual country forecasts is in order. Nevertheless, considerable gains are projected for China, India, Indonesia, Pakistan, and the Philippines, whereas per capita consumption is projected to decline marginally for Bangladesh and Nepal, by just over one percentage point, and somewhat more seriously for Bhutan and Mongolia by about 4 percentage points. In both cases of either increases or decreases in per capita food consumption between 1988 and 2000, the Uruguay Round as modelled does not alter the outcome in any significant way. Whether gains from other sectors, in say the textile sector, could offset some of these projected declines is not addressed in these projections.

8 Throughout the paper, the year labelled as 1988 actually refers to 1987-1989 average.

Table 2. Growth rates of production, consumption and trade of agricultural commodities, past and projected

	Actual (1978-1988)		Baseline (1988-2000)		Uruguay Round (1988-2000)	
	Food[1]	Total	Food	Total	Food	Total
			annual percentage			
Production						
World	2.2	2.2	1.6	1.6	1.6	1.6
Developed	1.2	1.1	0.3	0.2	0.2	0.2
Developing	4.0	3.8	3.2	3.1	3.2	3.1
Consumption						
World	2.3	2.3	1.6	1.6	1.5	1.6
Developed	1.2	1.2	0.0	0.1	0.0	0.1
Developing	4.0	4.0	3.2	3.1	3.2	3.1
Imports						
World	3.0	2.9	1.5	1.4	1.7	1.6
Developed	2.5	2.1	0.1	0.3	0.4	0.5
Developing	4.7	4.7	3.1	3.1	3.5	3.1
Exports						
World	3.1	2.9	1.2	1.3	1.4	1.4
Developed	3.1	3.1	0.7	0.5	0.8	0.8
Developing	4.7	4.0	3.9	3.0	4.2	3.1

1 Food comprises cereals, oilseeds and products, meat and dairy products.

Table 3. Food consumption in low-income food-deficit (LIFD) countries in the year 2000

	Total		Per capita	
	Baseline	Uruguay Round	Baseline	Uruguay Round
	(1987-1989=100)			
All LIFD countries	**151**	**151**	**118**	**118**
Africa	147	146	100	100
Latin America and Caribbean	133	133	102	102
Near East	132	131	93	92
Asia	154	154	124	124
of which (selected countries):				
Bangladesh	135	135	99	99
Bhutan	126	126	96	96
Cambodia	133	133	104	104
China	159	159	135	135
India	144	143	113	113
Indonesia	151	152	123	123
Lao People's Democratic Republic	144	144	103	103
Mongolia	118	118	86	86
Nepal	130	130	99	99
Pakistan	175	172	124	122
Philippines	146	151	112	116
Sri Lanka	119	119	103	103

1 LIFD countries include those with a net deficit in cereals (average over the past five years) and a per capita income in 1993 below the cut-off point of $1,345 used by the World Bank to determine eligibility for International Development Association assistance.

4. Trade flows and trade balances

Following the slow-down in global production and consumption of agricultural commodities, international trade is also projected to slow down considerably during the 1988-2000 period compared to the 1978-1988 period. The Uruguay Round is not seen as arresting this slow-down, despite a positive effect on the growth in trade for some commodities. For both the baseline run and the Uruguay Round run, growth rates of imports and exports of developed countries, in particular, are projected to be reduced drastically, to just 0.3 and 0.5 per cent a year respectively, compared to 2.1 and 3.1 per cent respectively in the earlier period.

The growth of agricultural trade of developing countries as a whole is also expected to slow down during the period 1988-2000 compared with 1978-1988, although growth rates are projected to remain well above 3 per cent. As regards food commodities, while the growth rate in the imports of developing countries is projected to decline from 4.7 to 3.5 per cent, that of their exports would decline from 4.7 to about 4.0 per cent between 1978-1988 to 1988-2000. Furthermore, while the Uruguay Round is projected to have no effect on the growth rate of food imports (3.5 per cent in 1988-2000 under both scenarios), food exports of developing countries would grow by 4.2 per cent under the Uruguay Round compared with 3.9 per cent under the baseline run. Overall, in view of the greater slow-down in developing countries' imports than that of exports under the Uruguay Round, their agricultural and food trade balance would be expected to improve.[9]

Indeed, the agricultural trade balance of developing countries as a whole is projected to improve from under $15 billion in 1988 to $22.5 billion in 2000, a 50 per cent increase (table 4). Of this increase some $3 billion would be due to the Uruguay Round. As regards the Asian region, its agricultural trade balance is expected to increase even more rapidly, from $4.9 billion to $7.9 billion, a rise of over 60 per cent.[10] However, this improvement of the agricultural trade balance of the developing countries in the Asian region is projected to be due to factors other than the Uruguay

9 However, it is worth emphasizing that, for both developed and developing countries, the effects that can be attributed to the Uruguay Round are rather small compared with all the other changes taking place between the base period and the year 2000, which are, in turn, reflected in the results of the baseline run.

10 The improvement in the agricultural trade balance of the region as a whole would not be shared equally by all countries. In particular, for the LIFD countries in the region which had a negative agricultural trade balance of over $1.3 billion in 1987-1989, this gap is projected to widen to $3.4 billion in 2000.

Round. Indeed, the effect of the Uruguay Round on the agricultural trade balance of the region as a whole is projected to be nil.

Table 4. Trade balances of agricultural commodities, past and projected

	Actual (1987-89)	Baseline (2000)	Uruguay Round (2000)	Other effects (2000)
		billions of US dollars		
World				
Imports	275.5	335.6	360.9	+0.3[a]
Exports	280.4	340.4	366.6	-0.8[b]
Developed countries				
Imports	208.7	237.7	256.8	–
Exports	198.5	223.1	240.0	–
Developing countries				
Imports	66.8	97.9	104.1	+0.3[a]
Exports	81.8	117.3	126.6	-0.8[b]
Africa				
Imports	8.4	13.2	14.0	+0.1[a]
Exports	9.4	12.8	13.8	-0.2[b]
Latin America and Caribbean				
Imports	10.5	15.0	15.9	–
Exports	30.9	44.2	47.8	-0.3[b]
Near East				
Imports	17.8	25.3	26.6	+0.1[a]
Exports	6.5	7.0	9.5	–
Asia				
Imports	30.1	44.4	47.6	+0.1[a]
Exports	35.0	53.3	55.5	-0.3[b]

a Estimated effect of loss of export subsidies on the imports of the subsidy receiving countries.
b Estimated loss of the potential value of preferences provided by the major preference giving countries.

In addition to the changes in agricultural trade balances owing to changes in the world market prices and to the volumes traded, there are two other effects that need to be considered. The first relates to the reduction in export subsidies from which some developing countries benefited on balance-of-payments grounds by paying lower prices for certain imports (especially food products) than those prevailing in the world market. Overall, based on the known reduction commitments in export subsidies, the loss to developing countries is estimated at $300 million by the year 2000, divided nearly equally between Africa, the Near East[11] and the Asia. As a consequence, over and above other changes, the import bill of the Asian region would increase by $100 million in the year 2000.

The second factor that has an effect on the agricultural trade balance relates to the lower value of preferences. The widespread reduction in standard tariff rates (i.e., the most favoured nation or MFN rates) combined with unchanged rates under the various tariff preference schemes (generalized system of preferences (GSP), Lomé, Caribbean Basin Initiative) signifies a reduction in the preference margin. The potential value of preferences given by the European Union, Japan and the United States of America in the agricultural sector in 1992, is estimated at $1.9 billion, one third going to Africa, 40 per cent to Latin America and the Caribbean, and the rest mainly to the Asia and Oceania. The Near East is estimated to have benefited very little. After the Uruguay Round reduction in MFN rates, the potential value of preferences is estimated to fall by $0.8 billion with losses of $billion 0.2, 0.3, 0.2 and 0.1 for Africa, Latin America and the Caribbean, the Asia and others respectively. On a commodity basis the biggest losses are estimated for fruit and nuts, sugar, coffee and tea.

Turning now more specifically to the effect of the Uruguay Round on the food import bills of developing countries, shown in table 5, the trend is for a sizeable increase in these bills. For the LIFD countries as a whole their food import bill is projected to be $9.8 billion (55 per cent) higher in the year 2000. About $3.6 billion of this increase (14 per cent) would be due to the Uruguay Round.

11 In this Chapter,the Near East includes Afghanistan, Bahrain, Cyprus, Islamic Republic of Iran, iraq, Jordan, Kuwait, lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, United Arab Emirates and Yemen.

Table 5. Food import bills of developing and low-income food-deficit (LIFDs) countries, past and projected[1]

	No. of countries	Actual (1987-1989)	Projected (2000)	Size of increase	of which: Uruguay Round effect	
		billions of US dollars				(per cent)
World						
All developing	137	40.0	64.7	24.7	3.6	15
LIFD	72	17.8	27.6	9.8	1.4	14
Africa						
All developing	52	6.0	10.5	4.5	0.5	11
LIFD	43	3.5	6.3	2.8	0.2	7
Latin America and Caribbean						
All developing	46	8.0	12.7	4.7	0.3	6
LIFD	10	1.6	2.4	0.8	0.1	12
Near East						
All developing	19	11.5	16.8	5.3	0.8	15
LIFD	6	3.7	4.7	1.0	0.1	10
Asia						
All developing	20	14.5	24.7	10.2	2.0	20
LIFD	13	9.0	14.2	5.2	1.0	19

1 Food comprises cereals, oilseeds and products, meat, and dairy products.

As regards the LIFD countries in the Asian region, their food import bill is projected to increase by $5.2 billion between 1988 and 2000, a 58 per cent increase. About $1.0 billion of this increase (19 per cent) is attributed to the Uruguay Round. While it appears that the food import bill of the region is projected to grow more than that of the LIFD countries as a whole, this has to be seen in conjunction with the substantial growth in per capita food consumption projected for the region up to the year 2000 compared with other LIFD regions (discussed above). Furthermore, this growth in imports does not imply a slacking in domestic production, as reflected by the high levels of self-sufficiency ratios (SSRs) which the region is projected to maintain. In fact, these ratios are projected to increase for both wheat and rice (table 6). They, in turn, are projected to fall somewhat for coarse grains, oilmeals and meat as a result of the high growth in demand for such commodities reflecting an economic dynamism and strength rather than weakness of the economies of the region. Nevertheless, as already mentioned, some of the LIFD countries of the region would not share in this overall economic growth, and food consumption

Table 6. Asian LIFD countries: Commodity balances and self-sufficiency ratios, pound projected

	Actual (1987-1989)				Baseline (2000)				Uruguay Round (2000)				Change in net exports Uruguay Round over baseline	Self-sufficiency ratios		
	Production	Imports	Exports	Net exports	Production	Imports	Exports	Net exports	Production	Imports	Exports	Net exports		Actual (1987-1989)	Baseline (2000)	Uruguay Round (2000)
	(thousand metric tons)				(thousand metric tons)				(thousand metric tons)				percentage	percentage		
FOOD COMMODITIES																
TOTAL CEREALS	531,960	31,100	6,976	-233	7,005	41,697	7,657	-34,010	702,592	4,010	5,024	-32,165	-5.4	95.4	95.7	96.0
Wheat	151,073	22,717	272	-245	2,156	26,079	269	-25,010	215,132	2,160	264	-21,409	-17.1	85.0	69.4	91.2
Rice	240,016	1,907	2,137	30	2,909	2,212	2,506	590	299,132	220	3,450	1,236	107.4	99.0	100.6	100.5
Coarse grains	140,071	6,465	4,567	-16	1,900	13,406	4,510	-8,796	100,328	1,620	4,290	-11,995	36.4	99.0	95.0	94.4
Fats and oils	16,460	4,501	2,257	-44	285	7,020	5,155	-1,865	26,783	770	5,337	-2,449	31.3	55.1	93.9	92.2
Oilmeals	8,531	1,836	3,019	61	155	3,341	3,175	-165	13,743	351	3,297	-296	76.3	116.1	98.6	97.9
TOTAL MEAT	32,734	117	630	13	616	362	1,147	765	60,061	50	713	346	-51.4	102.2	103.3	100.2
Bovine meat	4,093	66	194	25	62	114	294	100	8,691	6	110	-10	-105.9	103.2	102.1	99.0
Pig meat	2,141	13	32	19	33	4	62	75	3223		81	79	1.3	100.6	102.5	102.5
Ovine meat	22,265	3	534	31	363	20	451	431	37,662	10	131	27	-93.7	102.4	101.1	100.1
Poultry meat	4,215	35	70	35	110	224	320	95	11,205	30	363	56	-41.7	100.8	100.9	100.5
Milk	70,926	3,016	91	-125	1,146	3,500	103	-3,405	114,527	271	204	-2,584	-254	96.3	97.1	97.6
Butter	1,135	44	1	43	94	73	125	52	1,761	2	72	-136	-305.4	96.2	102.5	92.7
OTHER COMMODITIES																
Coffee	649	66	502	94	20	70	677	607	1,326		651	609.25	0.4	239.2	165.1	105.0
Cocoa	106	40	109	69	16	45	349	304	374		353	307.008	1.0	250.5	371.4	557.1
Tea	1,160	20	646	126	56	207	666	659	1,710	2	671	647	-1.6	213.6	162.9	150.9
Sugar	24,250	4,346	2,187	-161	322	6,053	4,962	-1,121	37,405	61	4,941	-1,243	10.9	91.6	97.1	96.5
Rubber	2,100	796	1,202	106	344	744	1,050	314	3,240	7	1,066	200	-10.9	123.1	110.7	109.4
Bovine hides and skins	507	261	240	33	54	245	420	102	961	25	214	-38	-121.1	94.5	122.6	96.2

levels for them would decline, despite much higher food import bills. Clearly, this group of countries should be a target for assistance to improve consumption levels and, in particular, to compensate them for any increases in their food bills as a result of the Uruguay Round, especially should they not gain in net terms in other sectors.

5. World price stability

An important consideration for food security is the impact of food production shortfalls, which in practice occur quite often. In this connection, an important anticipated benefit accruing from the Uruguay Round is the expected attenuation of the impact of such shortfalls on price instability. The idea behind this view is that by increasing the number of countries that are open to world price signals, through tariffication and reduction of tariffs as a result of the Uruguay Round, the shocks (arising say from unexpected production shortfalls) would be absorbed by a greater number of markets, thus cushioning the effect of such shocks on world prices. The production shock chosen for examination of this hypothesis was a generalized 5 per cent decline in cereals output in the year 1999 which would have an impact on world prices in the year 2000.

The impact in the year 2000 with and without the Uruguay Round is shown in table 7. As expected, the effects are quite dramatic – prices of cereals rise from 25 to 50 per cent above those of the normal crop year. Total cereal consumption in 2000 in the developing countries falls 2.5 per cent, import volumes rise slightly but import bills rise significantly by 40 per cent. The effect of a bumper crop is similarly significant although not symmetric to that of the crop failure. Cereal prices drop 15 per cent, cereal consumption expands by 2.5 per cent and the import bill would fall by 12 per cent. However, and contrary to expectations, the result of the simulation modelled in this study shows that the Uruguay Round appears to have almost no effect on the stability of cereal market prices.

Part of the reason for the large effect on prices is that global stocks are not projected to be large by 2000, just around 17 per cent of consumption in that year compared with often over 20 per cent in the 1980s and early 1990s. These results do indicate that countries need to keep in mind the risks of occasional sudden price surges of basic foods in the future. The liberalization of trade as modelled here, has only a marginal effect on cereal price variability, there being no evidence for a dampening effect. What is certain is that in the absence of adequate stocks, a shortfall in production will push up prices rapidly and it is the poorer countries that will suffer. The continuing problem of international food price instability

will need to be carefully monitored in the future and the role of private versus public stockholding will need to be assessed.

Table 7. Effect of crop shortfalls/bumper crops on cereal prices, with and without the Uruguay Round[1]

	Wheat	Rice	Maize	Millet/sorghum	Other grains
Normal crop (1987-1989=100)					
Baseline (2000)	97	107	103	105	98
Uruguay Round (2000)	104	115	108	110	105
Crop failure (percentage change above normal crop prices)					
Baseline (2000)	+25.8	+50.5	+24.3	+29.5	+24.5
Uruguay Round (2000)	+25.0	+50.4	+24.1	+29.5	+23.8
Bumper crop (percentage change below normal crop prices)					
Baseline (2000)	-19.6	-31.8	-18.4	-20.0	-18.4
Uruguay Round (2000)	-19.2	-31.3	-18.5	-20.0	-18.1

1 An across the board shortfall (bumper crop) of 5 per cent below (above) normal level is assumed for 1999 and its effect on price in year 2000 is measured.

D. IMPLICATIONS OF THE URUGUAY ROUND FOR FOOD SECURITY POLICY

Aside from the quantitative effects on food security which will be felt in the short to medium term, what is probably of greater significance is the new shape of agricultural and food security policies. The Agreement contains specific provisions which would limit the choices available to policy makers in the future. However, as regards food security, especially of developing countries, the Agreement also makes certain important exemptions. These provisions will be discussed below in relation to policies concerning production, consumption, and trade and market stability.[12]

12 The discussion here draws heavily on J. Greenfield and P. Konandreas, "Implications of the Uruguay Round for national Agricultural Policy Formulation", paper presented to the *FAO Expert Consultation on the Impact of Changing International Trade Environment of Agricultural Trade in the Near East Region*, Nicosia, Cyprus, 5-8 December 1994.

1. Production policy options

As regards production policy, the Agreement basically: (a) sets out an objective for production policy – that it should not distort prices and should be government funded; (b) establishes a long list of policies that are exempt from reduction; and (c) determines rules for reducing expenditure on the remaining list of policies. At no point are any production policies banned. What has been agreed is that the aggregate level of support associated with all such policies (the AMS) has to be reduced, in the case of developing countries, by at least 13.3 per cent over ten years.[13] A reduction of 1.33 per cent a year in expenditure on price support over all agriculture does not appear onerous. Moreover, money can be switched from one product group to another.

Many developing countries did not have significant AMS in the base period while others felt that their policies qualified for entry into the Green Box. In fact, the majority of developing countries (61 out of 71) reported zero AMS in the 1986-1988 base period and of those that reported a positive AMS (10 countries) this was below 20 per cent of agricultural gross domestic product (GDP) for eight of them (table 8). Of the developing countries of the region, two (the Republic of Korea and Thailand) reported a positive AMS. A small base AMS means very little discretion in providing price support in the future, if so desired. The contrast with some of the developed countries is evident. The large majority of them reported large AMS and only one (an east European country) reported zero AMS.

Table 8. Aggregate measure of support (AMS) as per cent of agricultural gross domestic product
(number of countries under each range)

(percentage range)	0	below 20	20-50	over 50	Total
Developing	61	8	2	0	71
Developed	1	3	5	8	17
Total	62	11	7	8	88

13 Note that the AMS excludes *de minimis* expenditures as well as all the Green Box policies.

Even if the AMS is negligible for developing countries, there is considerable room to continue to provide price support under the *de minimis* clause. The reason for this is that, providing expenditure on price support and similar activities is less than 10 per cent of the value of production, then such expenditures do not have to be reduced. But although 10 per cent of total value would not mean much if all production were affected by price support, in practice price support is often granted to only the marketed share of production, which can be much lower than 100 per cent. If we take the price support as applying to marketed output only, and assuming this share is 25 per cent of total production, the 10 per cent *de minimis* clause could be equivalent to a 40 per cent price support on marketed output. If these two approaches to providing support to production are exhausted (AMS and *de minimis*), then the only way that support can be given is via the Green Box.

Green Box policies include non-producer specific general services to the agricultural sector as a whole, as well as direct payments to producers provided that clear eligibility criteria have been followed and that there is no link between such transfers and the level of production or prices. The basic point behind all these policies is that they should not change production through interference with market price signals nor represent transfers from consumers to producers. There are also some additional important exemptions for developing countries under the Special and Differential Treatment (SDT) clauses of the Agreement. These include broadly-based input subsidies available to poor farmers and investment subsidies to the agricultural sector.

The extent to which Green Box policies are presently being pursued in developed and developing countries is shown in table 9. It is evident that every single Green Box policy is more common in developed countries than in developing countries. This is so because, by and large, policies permitted under the Green Box tend to be administratively complex. Most of the agricultural support policies pursued by developing countries presently fall under the "general services" category of Green Box policies, whereas decoupled income support policies are much rarer compared with the situation in the developed countries. Also, as shown in table 10, for the majority of developing countries the value of exempted policies was less than 5 per cent of agricultural GDP, although for some of them such values were significant. Similarly, SDT policies are presently rather insignificant. For the majority of countries the value of such policies as a percentage of agricultural GDP was below one per cent.

Table 9. "Green Box" measures exempted from reduction commitments

(percentage of countries claiming measure)

Measure	Developing (46)	Developed (11)
General services:		
• Research	67	100
• Pest and disease control	50	91
• Training services	43	55
• Extension and advisory services	59	91
• Inspection services	30	73
• Marketing and promotion services	41	64
• Infrastructural services	52	55
• General services (not specified)	28	45
Direct payments to producers:		
• Decoupled income support	4	27
• Income insurance and income safety-net programmes	9	27
• Crop insurance for natural disasters	24	91
• Structural adjustment assistance provided through producer retirement programme	2	27
• Structural adjustment assistance provided through resource retirement programme	2	45
• Structural adjustment assistance provided through investment aids	15	64
• Environmental programmes	30	45
• Regional assistance programmes	20	36
• Others (not specified)	20	27
Public stockholding for food security purposes	17	45
Domestic food aid	15	27
Special and differential treatment (SDT):		
• Investment subsidies	43	no access for developed countries
• Diversification from the growing of illicit narcotic crops	9	
• Agricultural input subsidies	41	

Table 10. Exemptions as a percentage of agricultural gross domestic product
(number of countries under each range)

(percentage range)	below 5	5-20	20-50	over 50	Total
Developing[1]	15	7	2	1	25
Developed	0	7	2	0	9
Total	15	14	4	1	34

1 Exemptions referring to special and differential treatment as a percentage of agricultural GDP were below 1 per cent for 21 countries and for the remaining 4 were below 5 per cent.

Although Green Box and SDT exempted policies are presently rather insignificant for developing countries, they could be potentially very useful in the future, in view of the limited options such countries have in pursuing AMS-disciplined policies, given the low AMS levels they have claimed. The difficulties for developing countries in pursuing Green Box policies may come from the government budget side in view of structural adjustment programmes (SAPs) that many of them are implementing.[14] Overall, notwithstanding these difficulties, the task of providing improved incentives to farmers in poor developing countries should become more feasible with the Uruguay Round. Higher world prices, smaller export subsidies, and a greater reliance on tariffs mean that prices to farmers could rise without expensive subsidies; if these stimuli prove to be inadequate, a judicious mix of permitted input subsidies and investment help could also be employed.

2. Consumption policy options

The problem for most developing countries would not come from providing incentives to farmers but from the need to keep down food prices to the consumers, or at least to contain a price rise. Already SAPs have pushed many developing countries into cutting consumer subsidies (which were often provided by keeping down producer prices). Given budgetary constraints, there may be a problem for some countries in letting farm prices rise and yet keeping down prices to consumers.

14 For a discussion on the potential conflicts between the provisions in the Agreement and those usually stipulated under SAPs, see P. Konandreas, "Uruguay Round Agreement on Agriculture: Implications for Developing Country Policies", paper presented to the 1994 Annual meeting of the *American Agricultural Economics Association*, August 1994, San Diego, California.

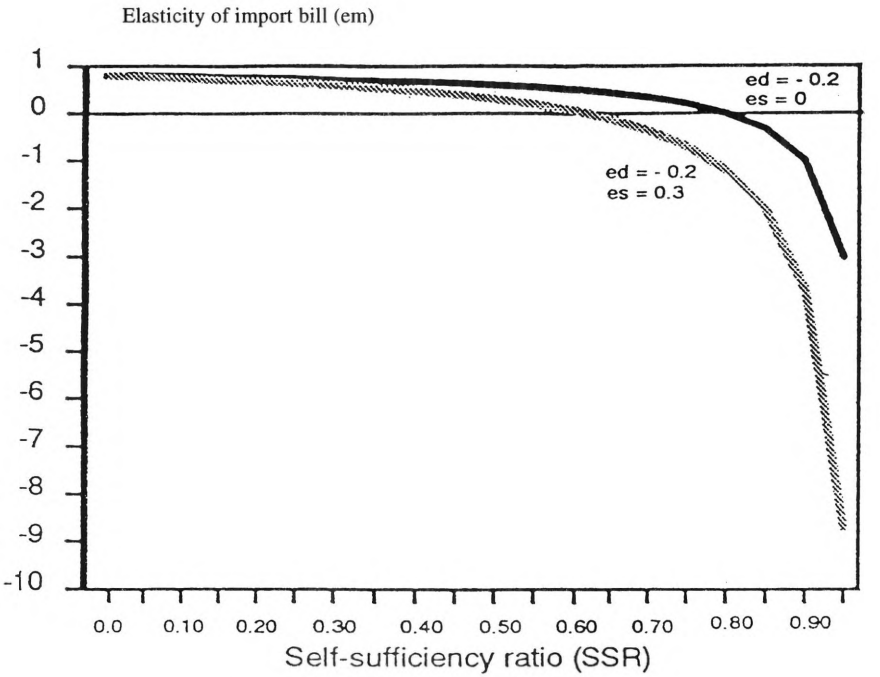
The way out of this dilemma is not to be found in the Uruguay Round texts, mainly because these texts do not concern themselves with consumer prices. Keeping such prices down tends to encourage imports or reduce exports, to which trading partners have no objection, for obvious reasons. However, the Final Act contains some important provisions which could facilitate national consumer food policy. First, there is an exemption for targeted consumer assistance. The Agreement, in its general case, stipulates that eligibility to receive food assistance shall be subject to clearly defined criteria related to nutritional objectives. However, there is an important exception to this general prescription which excludes from reduction commitments the provision of foodstuffs at subsidized prices with the objective of "meeting food requirements of urban and rural poor in developing countries on a regular basis at reasonable prices".[15] This is an important concession to countries of the region which provide subsidized food through fair price shops on a regular basis.

Second, there is a specific mention of the role of food aid in connection with the compensation principle embodied in the Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries. Here the promise is that if food import prices rise because of the implementation of the Uruguay Round, net food-importing developing countries and the least developed countries could be eligible for increased food aid, finance to help them maintain normal imports of food, technical assistance and eventually favourable treatment on agricultural export credits. Such aid could help dampen consumer price increases while allowing them to rise for farmers. Although the Decision spells out the principles for compensation, it does not address issues of how to operationalize it. Many questions arise in this respect, including criteria for country eligibility, definition of food, price triggering mechanisms, the timing of the compensation and finally the nature of compensation, i.e., food, financial or other forms.

Turning to the different forms of assistance envisaged under the Decision, FAO is, of course, particularly in favour of technical and financial assistance to raise agricultural productivity and to strengthen infrastructure. In fact this is precisely the right sort of response to higher world food prices. If the supply can be made more elastic, either in the short or the long run, import bills need not increase when world prices rise. This in turn is related to the extent of self-sufficiency. A country that is close to self-sufficiency at world prices is likely to be able to reduce import bills

15 Annex 2, paragraph 4, footnote 6 of the Agreement on Agriculture.

by relatively small productivity gains.[16] Vice versa, a country that is rather heavily dependent on imports is likely to require bigger efforts to ensure that the rise in world prices does not push up import bills. Unfortunately, many LIFD countries or indeed for a lot of middle income developing countries are dependent on imports for a number of key food items (notably wheat). Taking cereals as the key indicator and assuming supply and demand elasticities of 0.2 for the cereal sector, then countries with a self-sufficiency ratio of below 0.7 may well face higher cereal imports bills when world prices rise (Figure II). Many of the smaller countries in the



ed = elasticity of demand

es = elasticity of supply

$$em = es + \frac{ed - es}{1 - SSR}$$

Figure II. The elasticity of the import bill as a function of self-sufficiency ratios

16 Import bills will rise on increasing world price if the net trade price elasticity is less than unity. *Ceteris paribus* the smaller the net trade elasticity, the greater the share of trade in domestic demand/supply, i.e., the lower is the self-sufficiency ratio.

region, especially the Pacific small island states, have self-sufficiency ratios well below this level. It is within this context that assistance to boost productivity and raise output is of such importance especially if this enables farmers to respond better to price signals, that is, raise the elasticity of supply. Clearly, however, countries with very low self-sufficiency ratios will also need other types of assistance to cope with higher world food prices. With very low self-sufficiency ratios it is certain that increased world food prices will be reflected in higher import bills.

3. Trade policy and domestic market stability

The disciplines on trade policy are more extensive, as befits an agreement issuing from a trade organization. The disciplines on the use of export subsidies by developing countries are not of much concern to most developing countries as few of them use such subsidies. The provisions concerning import policy are perhaps the one area where the greatest change has occurred for most developing countries. Non-tariff import barriers should be abolished and reliance in future should be almost exclusively on tariffs, all of which are now bound, i.e., they may not be exceeded. The demise of non-tariff barriers and their replacement with tariffs does have some desirable consequences. *Inter alia*, provided tariffs are not prohibitively high, they should present a better chance for world prices to be reflected in domestic prices and hence improve the quality of price signals.

The danger is, of course, that the introduction of fixed tariffs at a level where imports take place may destabilize national market prices. Sharp falls in import prices with a fixed tariff imply a sharp fall in domestic prices, thereby causing distress to local farmers. High world prices can lead to inconvenient surges of exports, thereby driving up domestic prices to beyond the reach of the poor. This can easily happen even when there is no global food shortage, only one in a neighbouring country. There are a number of steps that countries can take to protect themselves from the danger of international price and market instabilities.

First, the Agreement allows countries that have opted to do so, to take special safeguards via the imposition of additional tariffs whenever import prices fall significantly to below 1986-1988 levels or when import volumes surge. In practice most developed but not many developing countries have reserved this right, as it was only allowed for countries that underwent tariffication.

Second, countries can adopt a "sliding scale of tariffs" related inversely to the level of import prices and keeping the maximum rate of duty at a level no higher than their bound rate of duty in the WTO. If the tariff binding is fairly high, which is commonly the case, developing countries can continue to offset quite big increases in import prices by a reduction in import tariffs and raise them when import prices fall. The offsetting effect can be obtained in a variety of ways. For example, it can come into effect when import prices go outside a "band" of floor and ceiling prices[17], it can be less than the change in import price and it can be tied to a moving average level of target prices rather than a fixed level.[18]

Third, another important instrument of supply management that is allowed by the Agreement is food security stocks. For developing countries, purchases for food security stocks at administered prices are allowed as long as the difference between the purchase price and the external reference price is included in the AMS. Although the definition of food security stocks is not entirely clear,[19] it certainly allows individual countries to define their food security objectives as well as how stocks can contribute to meeting these objectives. Also of importance is the fact that the costs associated with the holding of stocks, whether food security or other stocks, are not of concern to the Agreement. The Agreement does not include any provisions for either developed or developing countries on the losses that may be incurred by the public sector engaged in food marketing operations. However, such losses have been the usual target of SAPs.

Finally, yet another instrument to protect domestic food security at times of sharply rising world prices or sharply rising demand from a neighbouring country is to take action under Article 12 that allows limitations on exports providing other (the importing) countries' food security is taken into account. Naturally this instrument should be used with caution as it

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17 This is the approach used by some Latin American countries. See *price Stabilization mechanisms for Importable Agricultural Products in Latin America and the Caribbean*, Proceedings of the Round Table Conference Organized by FAO and the World Bank, October 1993, Santiago, Chile.

18 The important point with all such schemes is that the world price signal is not completely annulled by offsetting tariff changes, and domestic prices are allowed to move reasonably in line with world prices within a certain price band.

19 As regards the definition of food security stocks, the Agreement states that these stocks would have to be (a) "an integral part of a food security programme identified in national legislation" and (b) the volume of such stocks should correspond to "predetermined targets related solely to food security". (Annex 2, paragraph 4, footnote 5 of the Agreement on Agriculture.)

can crucially damage commercial relations with the countries affected unless the reasons for the step are made quite plain and it is not used arbitrarily.

E. CONCLUSIONS AND RECOMMENDATIONS

The Uruguay Round is foreseen to have important effects on world food security, including that of the Asian and Pacific region. These effects are basically of two types: the first relates to largely quantifiable and immediate effects, resulting from the specific commitments of the signatories of the Final Act. The second type relates to largely unquantifiable effects impacting on the choice of food security policy.

As regards the short- to medium-term effects on the food security of the region, the FAO analysis shows that the Uruguay Round would not slow down the further gains in per capita food consumption projected for the region as a whole by the year 2000. In addition, the Uruguay Round would not adversely affect the high reliance of the region on domestic food production to meet its food needs. Self-sufficiency ratios would remain high and for some commodities may even increase. However, in view of the marginally higher world food prices, as a result of the Uruguay Round, the food import bill of the region would increase somewhat. While this increase in the food import bill does not appear to affect adversely the per capita food consumption of the region as a whole, and in fact may be compensated by gains in other sectors, some of the low-income food-deficit countries of the region may face difficulties in maintaining their food imports. The reduction in subsidized food imports and the projected foreign exchange losses from tariff preference schemes may also exacerbate such difficulties. In view of this, the Decision incorporated in the Final Act calling for special assistance to least developed and net food-importing developing countries could be particularly important for the poorer countries of the region and every effort should be made towards developing modalities for it to become operational.

As regards the effect of the Uruguay Round on the choice of policy, the implications are manifold. Although the Agreement represents a very partial move towards trade liberalization, it represents a milestone in the development of agricultural and food policy and should lead to positive longer term effects for the sector.

The production disciplines stemming from the Uruguay Round are unlikely to cause much of an adjustment problem for most developing countries in the region, which in any case give rather little direct price support. For those, generally better-off developing countries in the region, that have previously maintained farm prices above import parity levels, they may continue to help farmers by a combination of tariffs, some price intervention, input and investment assistance and a variety of other Green Box measures. The constraint is not likely to come from the Uruguay Round but more from budgetary restrictions and commitments under SAPs. The most likely problem will be how to help poorer consumers deal with higher prices, a matter that is largely outside the remit of the Uruguay Round. This could be tackled by a combination of targeted food assistance, some domestic procurement at lower prices for a part of the crop, a more general tax on the increased revenue of the sector or by increased external assistance including food aid. The Agreement encourages countries to place greater reliance on tariffs to effect their national policy objectives. However, there is some concern that reliance on tariffs could lead to an increase in price instability in the importing country which could be mitigated by recourse to approaches like the sliding scale of tariffs as well as greater reliance on food security stocks.

Certain specific recommendations for the countries of the region derive from the above analysis: [20]

(a) The expected increase in food and agricultural prices in international markets may call for modifications in national food security and nutrition enhancement policies and strategies, including consumer price policies for food;

(b) Although the rise in prices at the world level, coupled with use of tariffs, can lead to more appropriate incentives to producers, most developing countries may also need to evolve targeted and decoupled (Green Box) forms of assistance that can be implemented at low budgetary costs;

(c) Tariffication may introduce greater instability to domestic prices, which may require reconsideration of producer price policies, including implementation of a sliding scale of tariffs or other instruments to prevent excessive instability;

20 Some of these recommendations are included in Food and Agriculture Organization of the United Nations, *Impact of the Uruguay Round on Agriculture*, (CCP: 95/13, Rome, January 1995).

(d) Countries will need to assess carefully the extent to which countervailing measures may be required to offset the internal price depressing effects of gradually declining but continuing high levels of protectionism elsewhere, and use the financial resources captured to increase food production and enhance food security in accord with their comparative advantages in a protectionism-free world;

(e) Following tariffication, and hence the elimination of non-tariff barriers, there may well be increased scope for intraregional or subregional trading arrangements based on tariff concessions;

(f) In particular, in view of likely reduction in global government-held food stocks, countries in the region, individually or collectively, should rethink the role of national or regional food security stocks to protect themselves against possible world price surges;

(g) Finally, every effort should be made to work out the modalities of the Decision in the Final Act to assist the poorer countries of the region and elsewhere in the event their food security is adversely affected by the Uruguay Round.

VI. IMPLICATIONS FOR THE PACIFIC ISLAND COUNTRIES *

by

Professor Allan Rae
Department of Agricultural Economics and Business
Centre for Agricultural Policy Studies
Massey University, New Zealand

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INTRODUCTION

This chapter addresses ways in which the Uruguay Round agreements, and in particular that on agriculture, could impact on the Pacific island countries. The chapter is divided into six sections. The first briefly refers to the role of agriculture in the Pacific island economies, and the second reviews those parts of the Uruguay Round agreements of most relevance to the chapter. In the third section, summaries are presented of various studies of how the Uruguay Round agreements might affect both the level and variability of international food commodity prices, and global economic growth. The fourth section suggests ways in which developing countries, even food importers, might benefit from trade liberalization. The implications of the Uruguay Round agreements for Pacific island countries' agricultural trade are discussed in the fifth section, and cover the cost of imports, export revenues, preferential treatment, horticultural exports and phytosanitary issues. Finally, the chapter presents some policy recommendations for agricultural export growth from the Pacific island countries.

It should be noted that of the Pacific island countries, only Fiji is a member (contracting party) to the General Agreement on Tariff and Trade (GATT), now the World Trade Organization (WTO). Five other Pacific island countries have maintained a *de facto* application to GATT and have until April 1995 to join without requiring substantial negotiations. These countries are Kiribati, Papua New Guinea, Solomon Islands, Tonga and Tuvalu. Samoa and Vanuatu are not entitled to such "summary accession".

A. AGRICULTURE, TRADE AND THE PACIFIC ISLAND COUNTRIES

1. The importance of agriculture

Agriculture is a major sector in the economy of the Pacific island countries (see *table 1*). It contributes around 30 per cent to total output in both Papua New Guinea and Samoa, 32 per cent in Tonga, and a little over 20 per cent in both Fiji and Vanuatu.[1] Apart from Tonga, exports of goods and services from these countries account for one third to over 60 per cent of gross domestic product (GDP), agricultural products being major earners

1 Economist Intelligence Unit, *Pacific Islands Country Report*, 4th quarter 1994.

of foreign exchange. The latest statistics show that food, beverages and live animals made up 88 per cent of export receipts in Tonga, 48 per cent in Fiji, 27 per cent in Samoa and 12 per cent in Papua New Guinea, where minerals and oil are major export earners.[2]

Table 1. Agriculture and the economy

Country	Agriculture's share of GDP[a]		Total exports share of GDP		Agriculture's share of exports[b]	
Fiji	20%	(1993)	53%	(1998)	60%	(1992)
Papua New Guinea	30%	(1990)	48%	(1992)	28%	(1990)
Solomon Islands	38%	(1991)	65%	(1989)	51%	(1991)
Tonga	32%	(1989)	17%	(1993)	72%	(1991)
Vanuatu	23%	(1990)	46%	(1990)	80%	(1991)
Samoa	31%	(1980)	30%	(1988)	87%	(1990)

Sources: Economist Intelligence Unit and the United Nations Conference on Trade and Development.

Notes: a defined as "agriculture" for Papua New Guinea and Samoa "agriculture, forestry and fishing" , for Fiji, Tonga and Vanuatu "primary industry" for Solomon Islands

b all food items

2. The composition and direction of trade

Tree crops, sugar, fruits and vegetables are the major agricultural exports from the region. On a country basis, the principal agricultural items are:

Papua New Guinea	coffee, cocoa and palm oil
Fiji	sugar
Solomon Islands	palm oil, copra, cocoa
Samoa	coconut products, taro and cocoa
Vanuatu	copra and beef
Tonga	squash and vanilla
Cook Islands	fruit and fruit products.

2 Asian Development Bank, *Key Indicators of Developing Asian and Pacific Countries 1993*, (Manila, Oxford University Prees, 1994).

Food and agricultural raw materials made up about one quarter by value of imports into Tonga and Samoa, and between 15 and 20 per cent for Papua New Guinea, Fiji, Solomon Islands and Vanuatu.[3,4] Available statistics (*table 2*) show that major food import items include meat, wheat, rice, dairy products and vegetables (Fiji); meat, fish and rice in Papua New Guinea; meat, wheat and rice in the Solomon Islands; meat, flour and sugar in Samoa; and meat, flour, and dairy and sugar products in Tonga.

Table 2. Major food imports
(millions of US dollars)

Item	Fiji (1992)	Papua New Guinea (1990)	Samoa (1983)	Tonga (1991)	Solomon Islands (1988)
All imports	630.7	1,233.1	52.6	59.3	97.8
All food & live animals	90.8	206.0	10.7	12.8	16.7
Meat & preparations	13.0	43.9	2.4	4.9	2.3
Dairy products	10.8	14.1	0.7	1.1	0.6
Fish & preparations	6.5	36.2	1.1	0.4	0.6
Wheat	9.9	11.6	..	..	1.8
Wheat flour/meal	2.7	..	1.6	1.7	0.9
Rice	8.2	41.0	0.5	..	5.3
Other cereals & preparations	7.6	12.3	0.9	1.1	1.1
Fruit & Vegetables	12.7	11.4	0.4	0.6	0.9
Sugar & honey	3.9	3.2	1.8	1.1	1.4
Coffee, tea, cocoa, spices	4.2	4.5	0.2	0.5	0.6

Source: United Nations.

.. data are not available or are not separately reported in trade statistics

3 Econimist Intelligence Unit, op.cit.

4 United Nations Conference on Trade and Development, *Handbook of International Trade and Development Statistics*, 1993.

Australia, New Zealand, Japan and the United States of America are the region's major trading partners, for both total exports and imports *(table 3)*. Apart from Tonga's imports from Fiji, intra-island trade would not appear to be of great importance (EIU).[3] Australia is Papua New Guinea's main trading partner, accounting for over 40 per cent of Papua New Guinea's exports and imports. Over 40 per cent of Fiji's exports are consigned to Australia and the United Kingdom of Great Britain and Northern Ireland, while over 50 per cent of imports are sourced in Australia and New Zealand. These two countries dominate trade with Samoa, accounting for almost 50 per cent of exports and 40 per cent of Samoa's imports. The European Union and Japan are the major destinations for Vanuatu's exports (60 per cent of the total), while over 50 per cent of imports are from Australia and New Zealand. Over 90 per cent of Tonga's exports are sold in Australia, Japan, New Zealand, and the United States, while over 70 per cent of imports originate in Australia, Fiji, New Zealand and the United States.

3. Food consumption and import dependency

Table 4 details the composition of the average diet in four Pacific island countries for 1992. Daily per capita food consumption varied from 2,614 Kcalories in Papua New Guinea to 3,089 Kcalories in Fiji. Of these, the proportion supplied by animal products is between 18 and 26 per cent for Fiji, Samoa and Tonga, but only 9 per cent for Papua New Guinea. Therefore, starchy root crops, coconut and derived products, and fruits and vegetables are important components of the diets in most of these Pacific island countries. Rice is an important food in Fiji, Papua New Guinea and Samoa with per capita consumption levels of 31 to 58 kilograms (compared with Japan's consumption of 74 kilograms). Wheat and derived products, such as flour, are important foods in Fiji and Tonga, but less so in Samoa and Papua New Guinea.

Wide variation exists between per capita consumption levels for livestock products. Consumption of dairy products is highest in Fiji at 96 kilograms (milk equivalent) per capita (compared with 216 kilograms in New Zealand), but only 6 kilograms per person in Papua New Guinea. The consumption of meat varies from 26 kilograms per person in Papua New Guinea to 71 kilograms in Samoa. (Consumption of meats in Australia for the same year was 109 kilograms per person). The more important meats consumed were beef and sheepmeat in Fiji, sheepmeat and pork in Papua New Guinea, sheepmeat, pork and poultry in Samoa and sheepmeat in Tonga. Consumption of fish ranged from 16 kilograms per capita in Tonga to 43 kilograms in Samoa (compared with 75 kilograms in Japan).

Table 3. Major trading partners
(percentage of total)

Country	Main export destinations		Main import origins	
Papua New Guinea	Australia	21	Australia	47
(1992 for exports)	Japan	41	Japan	13
(1990 for imports)			Unite States	10
Fiji	Australia	23	Australia	33
(1993)	United Kingdom	21	New Zealand	19
			Japan	11
	United States	11		
Solomon Islands	Japan	35	Australia	35
(1992 for exports)	Other Asia	28	Japan	16
(1990 for imports)	United Kingdom	20	Singapore	14
Samoa	New Zealand	30	New Zealand	31
(1990)	Australia	19	Australia	11
	Germany	12	United States	9
Vanuatu	European	32	Australia	41
(1993 for exports)	Union		New Zealand	11
(1992 for imports)	Japan	29	Japan	10
	Australia	11		
	Bangladesh	10		
Tonga	Japan	35	New Zealand	31
(1990)	New Zealand	24	Australia	22
	Australia	17	United States	12
	United States	16	Fiji	11

Source: Economist Intelligence Unit.

Table 4. Per capita consumption of major food items: 1992

Item	Fiji	Papua New Guinea	Samoa	Tonga
Total calories (K cals/day)	3,089	2,614	2,828	2,946
Percentage from animal products	20	9	26	18
Consumption of (kg per year) :				
Wheat	78	18	33	76
rice	58	46	31	3
starchy roots	102	261	225	407
coconut and copra	69	43	157	62
vegetables	27	84	7	50
fruit	18	346	204	105
meats	46	26	71	52
dairy products	96	6	27	26
fish	41	21	43	16

Source: Food and Agriculture Organization of the United Nations.

Table 5 details production and net imports of some foods where imports are important sources of supply. Each of the four countries is totally dependent on imports for wheat and derived products. Fiji produces domestically about one half of its rice requirement, while Papua New Guinea and Samoa are totally dependent on imports for this commodity. Import dependencies are generally very low for fruits and vegetables, although Fiji imported 36 per cent of its vegetable supplies. Imports were the major supply source for meats in each country, with dependency levels of 71 per cent in Tonga, 58 per cent in Samoa, 51 per cent in Papua New Guinea and 39 per cent in Fiji. Tonga and Papua New Guinea were totally reliant on imports for dairy product supplies, 75 per cent of dairy supplies were imported in Samoa, and 26 per cent of Fiji's dairy product supplies came from imports.

Table 5. Food self-sufficiency and trade dependence: 1992

	Production	Net imports (thousands of metric tons)	Total supply[a] (thousands of metric tons)	Self-sufficiency[b] (percentage)
Fiji				
wheat	0	57	58	0
rice	26	30	45	58
vegetables	14	8	21	67
fruit	12	2	15	80
meat	22	14	36	61
dairy products	62	22	84	74
Papua New Guinea				
wheat	0	72	72	0
rice	0	186	186	0
vegetables	370	9	379	98
fruit	1,743	9	1,752	99
meat	52	55	107	49
dairy products	0	25	26	0
Samoa				
wheat	0	7	7	0
rice	0	6	6	0
vegetables	1	1	1	100
fruit	43	-3	40	108
meat	5	7	12	42
dairy products	1	3	4	25
sugar	0	5	5	0
Tonga				
wheat	0	8	8	0
vegetables	7	0	7	100
fruit	17	1	17	100
meat	2	5	7	29
dairy products	0	2	3	0
sugar	0	2	2	0

Source: Food and Agriculture Organization of the United Nations.

a May not equal production plus net imports owing to stock changes.
b Production/total supply.

B. RELEVANT ASPECTS OF THE URUGUAY ROUND AGREEMENTS

1. The Agreement on Agriculture

The Agreement on Agriculture has five main components:

(a) Export subsidies;

(b) Market access;

(c) Domestic support;

(d) Safeguards;

(e) Special treatment of developing countries

The agreement will be implemented over a six-year period from 1995.

(a) Export subsidies

On a commodity-by-commodity basis, budget expenditure on export subsidies is to be reduced by 36 per cent and volumes of subsidized exports are to be reduced by 21 per cent of their 1986-1990 average values. Those products that have not received export subsidies in the base period will be ruled ineligible for future subsidies.

(b) Market access

A process known as "tariffication" has been agreed. It requires the conversion of non-tariff barriers to their equivalent tariffs as over the 1986-1988 base period, which then must be reduced by an average 36 per cent. The minimum reduction in individual tariff items is 15 per cent.

Exporting countries will also be given a chance to establish markets in regions where imports have not been significant. To begin, access will be granted at a level of 3 per cent of domestic consumption, rising to 5 per cent by the end of the implementation period. Tariff quotas may be used to achieve this, import tariffs being set at low or zero levels for 'within quota' imports, while 'out of quota' imports are subject to higher tariffs. These latter tariffs are subjected to the agreed phased reductions under the Uruguay Round.

c) Domestic support

Domestic support subsidies paid to farmers are to be reduced by 20 per cent from a 1986-1988 base, and will be applied to the total level of support across all commodities. Several domestic subsidies have been excluded on the grounds that they cause little, if any, distortion to international markets, or are associated with production-limiting programmes, or comprise less than 5 per cent of the total production value of a product.

(d) Special safeguard provisions

Safeguard provisions can be applied to allow a temporary increase in import tariffs if a sharp increase in import volumes or a steep fall in prices is experienced for a particular product. Such additional tariffs cannot, however, be applied to imports under minimum tariff quota commitments.

(e) Special and differential treatment for developing country members

There are a number of areas where the Agreement applies differently for developing countries. These include a lengthened implementation period of 10 years, and lesser tariff and subsidy reductions equal to two thirds of the corresponding commitment for developed countries. Any domestic support payment may be excluded from the reduction commitment provided it does not exceed 10 per cent of the total production value of the product in question. Developing countries enjoy additional exceptions for investment and input subsidies. Least developed countries shall not be required to undertake any reduction commitments.

In addition, because of the possible negative effects of the reforms on the least developed and food-importing developing countries, it was agreed that developed countries consider in the context of their aid programmes the agricultural productivity and infrastructural needs of developing countries, and it was recognized that such countries may require special assistance in financing normal levels of commercial imports. Least developed countries can also access increased technical assistance to enable them to maximize the benefits of market liberalization.

2. The Agreement on Sanitary and Phytosanitary Measures

Sanitary and phytosanitary (SPS) measures are those designed to protect human, plant and animal life and health, and include quarantine, livestock slaughter and inspection procedures, and food processing rules. The new agreed rules in these areas should assist especially those countries

for whom horticultural and livestock products are important exports, a situation that applies to several developing countries.

The Agreement on SPS provides increased emphasis on scientific justification for SPS measures, and requires that SPS measures should not unjustifiably discriminate against or between foreign suppliers, that SPS measures should be based on accepted international standards, that the negotiation of agreements regarding the equivalence of different countries measures be encouraged, and that SPS procedures be transparent, for example, by publication of relevant regulations.

3. The Agreement on Textiles and Clothing

This aspect of the Uruguay Round is briefly mentioned not because it is within the brief of the chapter, although it will likely affect the markets for certain agricultural raw materials, but because it will be of major significance to developing countries.

The Multifibre Arrangement (MFA) has in the past used a system of quotas to restrict the export of textiles and clothing from the developing countries to the developed world. Under this Agreement, the MFA and its associated quotas and trade restrictions will be phased out by the year 2005. The size of any quotas applied during the transition phase-out period will rise by an increasing rate. Countries will still be able to apply tariff protection against the imports of these products, but tariff bindings and reductions have also been negotiated within the Uruguay Round. Temporary import restrictions may be applied during the transition period according to a safeguard provision, although more favourable treatment may be applied to imports from developing countries.

C. IMPLICATIONS OF THE AGREEMENT ON AGRICULTURE

1. On world income growth

The increased trade and investment opportunities resulting from implementation of the Uruguay Round agreements will encourage the shift of economic resources to more productive uses and hence higher incomes to resource owners worldwide. Demand for most products will increase as a result, as will technical advancement, further investment and economic activity generally. Various estimates of the size of these global economic

gains have been made. A recent GATT report[5] suggests that when the Uruguay Round agreements are fully implemented by the year 2005, global GDP may be $510 billion higher than it otherwise would have been.

This gain is expected to be distributed over developed, industrializing and developing regions of the world. For example, 24 per cent of that gain was estimated to accrue to the United States, 32 per cent to the European Union, 23 per cent to a group of developing and transition economies, and 11 per cent to Japan, China and Taiwan Province of China. The size of global income growth and its distribution is of interest to the Pacific island countries when one considers how additional income translates into increased consumption in various countries. Increased growth in the European Union, the United States and Japan, for example, is likely to lead to increased demand for tourism services and speciality agricultural products, including those offered by the Pacific island countries. Increased incomes in developing economies, however, could generate increased demand for clothing and some foods.

2. On commodity prices and variability

Several attempts have been made to predict the extent to which food prices might change in international markets once the Uruguay Round agreements have been implemented. Conducted mostly in Western developed economies, these studies tend to focus on temperate products, and hence not the tree crops that are of major importance to the Pacific island countries. An exception that paid particular attention to developing countries was the cooperative study between the Organization for Economic Cooperation and Development (OECD) Development Centre and the World Bank, which will be referred to below. Because of the complexities of analyzing trade in horticultural products, they also tend to have been omitted from these studies.

One of the most comprehensive and timely agricultural studies is that of the Australian Bureau of Agricultural and Resource Economics. They concluded that reduced subsidies and subsidized exports, and increased market access would increase prices of agricultural commodities entering world markets relative to what would otherwise be the case. With the exception of dairy products, though, these rises are expected to be modest and generally less than 10 per cent, and will become evident gradually over the next decade (see *table 6*). Rice and wheat prices are expected to

5 J.F. Francois, B.McDonald and H. Nordstrom, *The Uruguay Round: A Global General Equilibrium Assessment.*

rise by 8 per cent, and that of sugar by 1 per cent. Predicted rises in international meat prices are 7 per cent for pork, 3 per cent for sheepmeat, 2 per cent for poultry and 6 per cent and 1 per cent for beef. As regards dairy products, estimated price increases were 20 per cent for cheese, 16 per cent for milk powders but only 4 per cent for butter.

Table 6. Uruguay Round agreements will increase commodity prices

Commodity	Increase in world price (percentage)
Beef (FMD free)	6
Beef (FMD affected)	1
Pork	7
Sheepmeat	3
Poultry meat	2
Butter	4
Cheese	20
Milk powder	16
Wheat	8
Corn	6
Other coarse grains	5
Rice	8
Soybeans	1
Other oilseeds	6
Cotton	2
Sugar	1

Source: Australian Bureau of Agricultural and Resource Economics.

The Organization for Economic Cooperation and Development (OECD)-World Bank study[6] gave, for a number of possible reasons, somewhat different results to those reported above. However, in the main, the conclusion that most food prices would rise moderately was supported. Goldin and others 6 used a general equilibrium model, so were able to report results for both agricultural reform and multi-sectoral reform scenarios. The model also included tropical beverages. The results are summarized in *table 7.* Price rises are generally dampened under multi-sectoral reform, owing to a shift in demand away from food as domestic non-agricultural prices fall. However, those prices which have a tendency to fall under agricultural trade reform, such as coffee and cocoa, decline even more.

6 I. Golden, O. Knudsen and D. van der Mensbrugghe, *Trade Liberalization: Global Economic Implications* (Paris, OECD and the World Bank, 1993)

Table 7. Partial liberalisation and world prices: OECD-World Bank estimates

Commodity	Change in world prices (percentage)	
	Agricultural reform	Multisectoral reform
Wheat	5.9	3.5
Rice	-1.9	-5.0
Coarse grains	3.6	1.5
Sugar	10.2	8.0
Beef, veal, sheepmeat	4.7	2.8
Other meats	1.0	-1.2
Coffee	-6.1	-8.2
Cocoa	-4.0	-5.7
Tea	3.0	0.1
Vegetable oils	4.1	1.7
Dairy products	7.2	5.1

Source: I. Goldia, O. Knudsen and D. Vande Mensbrugghe, *Trade Liberalization: Global Economic Implications* (Paris, Organization for Economic Cooperation and Development, 1993).

Because of the obvious implications of these results, two comments on the OECD-World Bank methodology can be made. The first is that the study appeared to be conducted, unlike that of Australian Bureau of Agricultural and resource Economics, before the details of the Uruguay Round agreements were known. Therefore, their partial agricultural reform scenario included reduction of tariff equivalents, input subsidies and export subsidies by 30 per cent, rather than the components of the Uruguay Round agreements. Thus, an important omission from this scenario is the agreed reduction in the volumes of subsidized exports. Other studies, such as that of Rae and Nixon, have shown that it is this component of the Uruguay Round agreements that will have the major impact on world prices. Second, the OECD-World Bank reforms include a 30 per cent reduction in export taxes, and these taxes tend to have been used by the major producers of tropical beverages. Thus, their reduction encourages domestic prices and production to rise and world prices to fall, yet the Uruguay Round agreements do not require contracting parties to do anything with regard to export taxes.

The above point can be further emphasized by referring to the study of Mabbs-Zeno and Krissoff. Also conducted prior to the conclusion of the Uruguay Round, it evaluated the impacts of trade reforms on coffee,

cocoa and tea markets. One scenario examined the complete removal of all protectionism in developed countries (which obviously exceeded the finally-agreed reforms), while the second also assumed complete liberalization in the producing (i.e. producer-taxing) countries. The results are summarized in *table 8*. Reforms in the developed countries alone resulted in rises in world prices of these products and also in the export revenues of producer nations. The reverse result, somewhat similar to that of the OECD-World Bank study, was obtained when trade reform was extended to include the developing producer nations. Thus, pending further detailed analyses of the actual Uruguay Round bindings, caution would seem to be especially prudent in terms of the impacts on tropical beverage producing countries, such as some of the Pacific island countries.

Table 8. Effects of complete trade liberalisation on tree crop prices

Commodity	Change in world price (percentage)	
	Non-LDC[a] policies removed	LDC and non-LDC policies removed
Cocoa		
bean	0	-44
liquor	6	-31
cake	24	-38
butter	2	-32
Coffee		
green	1	-35
roast	5	-19
soluble	4	-10
Tea	0	-27

Source: C. Mabbs-Zeno and B. Krisoff, "Tropical Beverages in the GATT" , CL. 6 in I. Golden and O. Knudsen, eds., *Agricultural Trade liberalization: Implications for Developing Countries* (Organization for Economic Cooperation and Development and the World Bank, 1990)

a Least developed country.

Fluctuations in commodity prices are especially disruptive to those economies from which commodity exports predominate, as in the Pacific island countries. Increased access to markets formerly insulated from world events, and the reduced use of export subsidies, should combine to reduce such commodity price variability. Tyers and Anderson[7] provide estimates of such reduced price variation. Using a trade reform and tariffication scenario not too dissimilar to the Uruguay Round agreements, they

demonstrate that such a reform of trade policies would reduce the coefficient of variability of their international food price index from 32 per cent to 18 per cent, or by nearly one half. The greatest commodity-specific reductions occur in the wheat, beef/sheepmeat and dairy product markets, all significant food import items for the Pacific island countries.

D. CAN DEVELOPING COUNTRIES GAIN FROM TRADE LIBERALIZATION?

Given the increases in agricultural commodity prices that are likely to result from the Uruguay Round agreements, it may be thought that the trade reforms will be damaging to developing countries that rely on food imports, the cost of which would rise. While this could be a result, it is possible that developing countries, even those which are net importers of food, could benefit from the trade reforms.[7]

For commodities imported by developing countries, a rise in the price of those imports may reduce the welfare of consumers by more than the gains experienced by domestic producers of the commodity, resulting in a net welfare loss. There are, however, a number of situations in which this loss would be reduced, or even reversed.

International commodity prices may rise sufficiently to switch the developing country from an importer to an exporter of the commodity in question. Depending on the extent of the price rise, domestic producer gains could now more than offset the losses to consumers. In addition in this situation, the balance of payments would improve, usually a major issue in developing countries. And still on the balance-of-payments issue, even if the country remained a net importer of food, a higher per unit import price need not result in higher expenditure on food imports, depending on the extent to which the higher price diminishes the need for imports.

Research has shown that the trade reforms will reduce the instability of international commodity prices. For example, climatically-induced production shocks will have less impact on world prices since the now more open industrialized countries will themselves absorb more of this shock than previously. Provided that the developing countries allow world price changes to be transmitted to their domestic economies, and that

7 K. Anderson and R. Tyers, "How developing countries could gain from agricultural trade liberalization in the Uruguay Round" in I. Golden and O. Knudsen, eds., *Agricultural Trade Liberalization: Implications for Developing Countries* (Paris, OECD, 1990)

producers and consumers are averse to price risk, then the developing countries will experience a gain in welfare. The distribution of incomes is often considered less than satisfactory in developing countries. Higher commodity prices resulting from trade reforms are likely to improve the distribution of income, even if the country remained a net importer of food. The rise in prices will benefit developing country producers, but not consumers. In the event that rural incomes are lower than those of the urban population, then higher prices will lead to a more even income distribution.

It is well known that technical innovations can be induced by improved economic incentives and stability, such as those resulting from trade reforms. Under such circumstances, even a developing country that remains a net importer of food can experience a boost in agricultural productivity growth and improved welfare as a result of trade liberalization. Development proposals may become more profitable when evaluated against higher and more stable border prices, and the rates of return on research and development expenditures will be enhanced.

Even should the developing country appear to suffer a welfare loss owing to trade reform, market liberalization should still be supported. Through participation in multilateral negotiations, the country can have a legitimate claim to trade concessions in other areas in return for supporting reforms that result in increased food import costs. These could include improved access to industrial countries for textiles, clothing and raw material exports.

The above results derive from traditional partial equilibrium analysis that focuses only on the agricultural sector. But as indicated above, the Uruguay Round trade reforms will provide a boost to world economic growth, increasing global demand for many goods and services, such as minerals and clothing, which are major exports of some Pacific island countries. Thus, incomes in those sectors should benefit from the reforms. Enhanced rural incomes in developing countries will also result in increased demand for goods produced in their manufacturing sectors, allowing any producer income gains from food trade reforms to be passed on to other sectors of the economy.

E. SOME IMPLICATIONS FOR AGRICULTURAL TRADE OF THE PACIFIC ISLAND COUNTRIES

1. The cost of food imports

The previous section indicated ways in which higher commodity prices might affect the welfare of net food-importing countries. Here, an attempt will be made to quantify the possible rise in the food import bill as a result of the GATT trade reforms, using Fiji and Papua New Guinea as case studies. Details of the calculations are contained in *table 9*. Attention is focused on the relatively unprocessed food commodities, whose prices might be expected to rise by the proportions estimated from trade modelling analyses. For the more highly processed items, such as flour and bakery products, the raw commodities constitute a smaller proportion of the final product value, whose price rise could be substantially less than that of the raw material.

It should be noted that the results could over-estimate any actual future rise in the cost of food imports for the following two reasons. First, the world price increases estimated by the Australian Bureau of Agricultural and Resource Economics have been used, rather than the lower price increases estimated by the OECD-World Bank. Second, the calculations assume that for each product, the quantities imported remain unchanged. This was necessary due to the lack of data on how production and consumption in the Pacific island countries might adjust to higher prices. Ordinarily, consumption would fall in response to higher prices as consumers shifted their purchases to other food and non-food items. Also, domestic producers could increase production and both these effects would result in a smaller volume of imports.

In 1992, Fiji's total imports were valued at $631 million, of which $91 million (or 14 per cent) was expended on food imports. Of the latter, a total of $42 million could be identified from the trade statistics as being relatively unprocessed. Applying the commodity price increases of the Australian Bureau of Agricultural and Resource Economics to this latter vector of commodities indicates that as a result of the Uruguay Round agreements, the cost of these imports could rise by 7.4 per cent. Assuming the prices of other imported items remained unchanged, including those of more highly processed foods, then total food imports could rise in value by 3.4 per cent, while the total import bill would rise by 0.5 per cent.

Table 9. Possible impact of rising prices on food import cost

Item	Actual imports 1992 (millions of US dollars)	Assumed price rise (per cent)	New import cost (millions of US dollars)	Change (per cent)
Fiji (1992)				
mutton	10.5	3	10.8	
beef	1.6	6	1.7	
butter	3.7	4	3.8	
other dairy products	6.2	16	7.2	
wheat	9.9	8	10.7	
rice	8.2	8	8.9	
other cereals	2.0	5	2.1	
SUBTOTAL	42.1		45.2	7.4
other food & live animals	48.7		48.7	
TOTAL food & live animals	90.8		93.9	3.4
Other imports	539.9		539.9	
TOTAL	630.7		633.8	0.5
Papua New Guinea (1990)				
mutton	18.1	3	18.6	
beef	15.0	6	15.9	
dairy products	10.4	16	12.1	
wheat	11.6	8	12.5	
rice	41.0	8	44.3	
feedstuffs	9.0	5	9.5	
SUBTOTAL	105.1		1,12.9	7.4
other food & live animals	100.9		100.9	
TOTAL food & live animals	206.0		213.8	3.8
other imports	1,027.1		1,027.1	
TOTAL	1,233.1		1,240.9	0.6

Source: United Nations and the Australian Bureau of Agricultural and Resource Economics.

The latest available statistics for Papua New Guinea were for 1990, when total imports were valued at $1,233 million. Of this, $206 million (or 17 per cent) were imports of food. After applying the estimated commodity price increases to imports of beef, mutton, dairy products, wheat and rice, the import cost of just that mix of commodities could increase by 7.4 per cent. Again assuming no changes in the prices of other food or non-food imports, this translates to a rise of 3.8 per cent in the value of food imports, and of 0.6 per cent for total imports.

For the reasons already given, the cost of the Pacific island countries' food imports could in fact rise by less than the 3 to 4 per cent estimated above. Provided that international price rises are transmitted to the domestic economy and become reflected in prices received by producers, then the latter will face increased incentives to expand production and therefore national self-sufficiency in a number of products. This may especially be the case for livestock farming; dairy and other livestock development projects should show more attractive rates of return.

2. Export revenues and preferential treatment

The Pacific island countries already export agricultural products duty-free or under preferential arrangements into a number of countries. These include duty-free access to Australia and New Zealand under the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA) and duty-free or preferential access to the European Union under the Lome Convention.

The Pacific island countries' margins of preference in the Australian and New Zealand markets have already been substantially reduced or eliminated because of unilateral trade reforms. Many tariff lines now enter New Zealand at a zero tariff rate. Of the remaining items, duties within the 15-20 per cent band are to be progressively reduced to 10 per cent, and those over 20 per cent will be reduced to 15 per cent, between July 1996 and 2000. It should be noted that most textiles and clothing enter New Zealand within this range of rates, so reducing the preference margin of the Pacific island countries. As this process continues in New Zealand, at least 92 per cent of tariff lines at the HS4 level will be in the 0-5 per cent range by the year 2000.

The European Union's GATT commitments on tree crop commodities could impact significantly on preference margins, as these are among the Pacific region's most important exports. The European Union schedule with respect to commodities relevant to the Pacific island countries

is given in *table 10.* In many cases the bound reduction in most favoured nation (MFN) tariff rates is substantial, and will result in a decline in the existing margin of preference over non-Lome exporters. Note that in the case of cocoa beans and shell the entire margin of preference will be removed, and that copra already enters the European Union duty-free and therefore there is no margin of preference. The European Union's oilseed sector had been heavily subsidized, and reductions in protection brought about by the Common Agricultural Policy (CAP) reform and the Uruguay Round agreements could open up new opportunities for external suppliers to this market.

Preference margins in the past can either be captured by traders, passed back to producers, or shared by both groups. Grynberg[8] believes the actual distribution of preference margins for tree crop products among the interested parties to be unclear and complex, but concludes that regardless as to whether the margin had been passed down to producers or captured by traders, the loss or diminution of the margins can only serve to diminish the incentive to either produce tree crops in, or source these products from, the Pacific island countries. Grynberg also concludes that the reduction or loss of these margins of preference has important implications for revenues received from Stabex, the European Union's commodity stabilization programme. Payments to countries under this scheme depend upon the volume of exports to the European Union. Stabex earnings could, therefore, fall as preference margins in the EU decline and exporters as a result seek alternative markets.

Sugar is Fiji's major export earning in 1993 about 30 per cent of total export revenue. The European Union takes nearly half of Fiji's sugar, Fiji having had since 1975 a substantial quota under the terms of the Lome Convention. This sugar is sold at the European Union's intervention price, usually two to three times the world price. As a result, a considerable transfer of funds from the European Union to Fiji has taken place, estimated by Grynberg to have been worth in 1991 $90 million, or 4 per cent of Fiji's GDP. Sales are also made to the United States under quota arrangements.

The European Union's commitments with respect to sugar are therefore of vital concern to Fiji. The European Union is a major sugar exporter, with the aid of substantial export subsidy payments. Both the level of these payments and the volume of subsidized exports must be reduced by the required amounts over the implementation period of the

8 R. Grynberg, "The clousre of the Uruguay Round and its impact upon Forum island countries", University of the South Pacific, 1994.

Table 10. European Union most favoured nation tariffs: Present and bound rates

(percentage)

Product	Present rate of duty	Bound rate of duty	Percentage reduction
Cocoa			
beans	3	free	100
shells	3	free	100
paste	15	9.6	36
butter	12	7.7	36
powder	16	8	50
Coffee			
not roasted	5	free	100
not roasted decaffeinated	13	8.3	36
roasted	15	7.5	50
roasted decaffeinated	18	9	50
Tea (green)			
>3kg	free	free	0
<3kg	5	3.2	36
Tea (black)			
>3kg	free	free	0
<3kg	5	free	100
Copra	free	free	0
Coconut oil			
crude: technical or industrial use	5	2.5	50
other< 1kg	20	12.8	36
other> 1kg	10	6.4	36
Palm kernel oil			
crude: technical or industrial use	5	3.2	36
other< 1kg	20	12.8	36
other> 1kg	10	6.4	36
Vanilla	11.5	6	48

Source: European Communities Schedule to the Uruguay Round of Multilateral Trade Negotiations (vol. 19).

Uruguay Round agreements. In the case of sugar, the European Union is committed to cutting the volume of subsidized sugar exports from a base of 1.617 million tons to 1.277 million tons by the year 2000, a reduction of 21 per cent. Just how the European Union will bring about this adjustment is as yet unclear, but of concern to Fiji is whether it will involve a downward adjustment in the intervention price.

The Economist Intelligence Unit talks of modest declines in the sugar intervention price over the next four years, but a more marked decline thereafter. Grynberg reports an expected decline in the sugar intervention price of 12-15 per cent by the year 2000. Haley and Vivien[9] have analyzed alternative European Union sugar policy reforms that would be consistent with the GATT commitment. One of these requires a small reduction in the "A" quotas accompanied by an 8 per cent reduction in the intervention price. The world price, incidentally, was estimated to rise by just under 10 per cent. The United States Department of Agriculture sees reductions in European Union sugar quotas, but higher world prices that would allow the European Union to increase its exports of unsubsidized sugar.

It would appear that the price received from sugar sales to the European Union will likely fall as a result of the Uruguay Round agreements by the end of the decade, although this loss of revenue could be at least partly made up from increased prices from sales on the open market. While preference margins on sugar exports to the European Union will likely fall, preferential access under the Lome Convention has been protected by waiver from challenge from other contracting parties to WTO. This waiver is valid for the duration of the Lome Convention, and will expire on 29 February 2000. It is possible that the European Union will not extend the Lome Convention beyond that time, so Fiji's sugar industry will sooner or later need to face the adjustments necessary to survive with lower producer prices.

Despite the sugar industry being highly protected in the United States, the Uruguay Round agreements will have little impact on United States sugar policies. The United States minimum access commitment provides for sugar imports to be maintained at the current level of quota imports. This is a binding commitment, so exporters to the United States will be guaranteed that further erosion of aggregate imports will not occur.

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9 S.L. Haley and D.A. Vivien, "Reform of EC Sugar Policies: intervention price and quota reductions versus transferable sugar quotas, implications for the EC an dthe United States", presented at a conference on New Dimensions in North American-European Agricultural Trade Relations, Calaria, Italy, 20-23 June 1993

While the United States has agreed to reduce the import tariff progressively on over-quota raw sugar, this will have no meaningful impact since the tariff rate will still be well above recent levels of world prices. The United States sugar support arrangements are, therefore, unlikely to be adjusted, and the internal sugar price is likely to remain unchanged.[10]

The Uruguay Round phytosanitary agreement could provide major benefits to horticultural exports from the Pacific island countries. There are three main parts to this agreement. First, non-discrimination requires that the importing country apply the same phytosanitary standards to all supplying countries, and hence cannot discriminate among suppliers. Second, equivalence requires that the importing country indicate the required security levels, but that the treatments necessary to reach those levels be decided by the supplying countries – in other words, different treatments may be equivalent in reaching a particular phytosanitary standard. Third, when an importing country imposes SPS measures, they must be technically justified. Obviously, maintaining the integrity of their certification procedures is an issue for the exporting nations including the Pacific island countries. Membership of WTO will provide exporters with access to its established and strengthened dispute settlement procedures, which may provide advantages over the dispute settlement process otherwise available through the International Plant Protection Convention. It should also be noted that the Pacific Plant Protection Organization has recently been established. This should offer several benefits to the Pacific island nations, including a mechanism by which a regional input can be made to the development of international standards, implementation of standards, dispute settlement, and access to databases and improved information flows.

F. POLICY RECOMMENDATIONS FOR THE AGRICULTURAL EXPORT GROWTH OF THE PACIFIC ISLANDS

The closure of the Uruguay Round and the adoption of its Agreement on Agriculture are facts. While the future ramifications of that agreement can only be forecast, it would appear that for at least some Pacific island countries export revenues from traditional crops may fall, special trade privileges in traditional export markets will diminish over time, and food import costs might rise somewhat. At the same time, new opportunities may arise especially with regard to exports of horticultural

10 A. Hafi, P. Connell and I. Roberts, "US sugar policies: market and welfare effects", Australian commodities.

products to niche markets, and world price movements for livestock products should encourage increased self-sufficiency in that area. An issue for the Pacific island countries is what is the relevant policy reaction to the above circumstances? Some recommendations are given below.

1. The need for an outward-looking approach

There can be no doubting the global trend towards the "single market place". Apart from the reforms bought about through the GATT negotiation processes, countries all around the world, both developed and developing, are implementing their own unilateral trade and policy reforms. These, together with rapid technological advances in communications, are making national borders of less relevance economically, and are greatly facilitating the movement of goods, finances and information among markets. These kinds of developments are nowhere seen more clearly than in the Pacific Rim markets of East Asia and Oceania, which are favourably located with regard to the Pacific island countries.

To cope with these eventualities and to benefit from changes in world markets and trade, the Pacific island countries should seek to broaden their trade and investment links through an enhanced outward orientation in their policy making and commercial environment. The development of the economies of the Pacific island countries can be greatly encouraged through effective economic engagement with the rest of the world. While the Pacific island countries will need such trade and investment links, it cannot be admitted that the rest of the world is so dependent on such links with the Pacific island countries.[11] Thus, an appropriate policy reaction of the Pacific island countries is to focus on enhancing international competitiveness through a continuation of structural adjustments and economic reforms.

2. Continuation of economic reforms and roles for government

In a deregulated and outward-oriented economy, the task of selecting appropriate production mixes and processes is best left to the private sector, guided amongst other things by international price relativities. This applies as much to agriculture as to other sectors of the economy. The role of government should ensure that policies do not distort the pattern of production, and should provide macroeconomic stability. While some Pacific island countries have recognized the need for fundamental economic reforms so

11 World Bank, Pacific island economies: toward efficient and sustainable growth, Report 11351-AAP, Washington, D.C., 1993.

as to reduce the role of government and to encourage the development of the private sector, these efforts need to be continued to provide a more competitive environment, to reduce distortions and to weed out inefficiencies in their domestic economies.

The Pacific island countries have had some success in the past in diversifying their agriculture to include high-value horticulture crops, including squash, papaya, ginger, vanilla, pepper, taro and cut flowers. The high unit value of these commodities means that significant industries can be created on relatively small land areas. They also make intensive use of labour – both important considerations for the Pacific island countries. Development difficulties have been encountered however, including quality control, reliability of supply and inadequate linkages to markets.[12] Therefore, consideration needs to be given to appropriate roles for government, the private sector and aid donors, in areas such as research and development, technology transfer, post-harvest and plant health facilities, advisory services and training.[13]

In relatively isolated economies such as the Pacific island countries, with typically small-scale production enterprises, the collection of appropriate information can be difficult and expensive. Such information is vital to the selection of appropriate investment projects, and the successful diversification of agricultural export products and markets. Governments might, therefore, play a useful role in promotional and information collection and dissemination activities. In this regard the activities of New Zealand's trade development agency, Tradenz, could be studied as a possible model. This works with the private sector to encourage the identification and development of new export products and markets.

One factor identified by the World Bank that could impede international competitiveness, is high wage rates relative to competitor countries. Alternative approaches to public sector wage setting ought to be examined, if these relatively high wages are not to spill over into the private sector and hence damage the competitiveness of domestic agricultural (and other) value-adding activities.

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12 B.A. Bell, "The international competitiveness of Pacific island agriculture", paper presented to annual conference of the Australian Agricultural Economies Society (New Zealand branch), 1990.

13 P. Chand, "New food and agribusiness market opportunities: Some recent developments from the Forum island countries", in A.N. Rae, ed., *Pacific Rim Agriculture: Opportunities, Competitivieness and Reforms*, Centre for Agricultural Policy Studies, Massey University, New Zealand, 1993.

3. Involvement with WTO and Regional Institutions

Through membership of the World Trade Organization, the Pacific island countries can best seek to protect their interests in future trade negotiations. There are several reasons why Pacific island countries (Fiji already is a member) would benefit from membership of WTO:

(a) The Uruguay Round agricultural trade reforms may be regarded as the first step in an on-going process of agricultural policy reform. The Agreement will be reviewed before the end of 1999, and future negotiations are mandated before the transition period ends. These will, no doubt, further impact on the economic interests of the Pacific island countries; their interests can best be catered for if they are able to take full part in the negotiations;

(b) Through participation in multilateral negotiations, the Pacific island countries can have a legitimate claim to trade concessions in other areas in return for supporting specific agricultural reforms;

(c) Because of the small size of the Pacific island countries, their negotiation strength could be enhanced through membership of and active participation in the work of the so-called group of "fair" agricultural exporters, the Cairns Group;

(d) A new item on the agenda of WTO, which will become increasingly important to the Pacific island countries, includes trade and the environment; closer involvement with WTO will ensure that other possible new trade issues not yet on the WTO agenda reflect the interests of the Pacific island countries.

(e) The strengthened dispute settlement procedures of WTO will provide small trading countries, such as the Pacific island countries with the ability to protect their trading interests against unfair trade practices of stronger trading nations;

(f) Other benefits from WTO membership include greater access to trade and policy information, a higher level of technical assistance from WTO and access to various types of compensation as developing countries.

While membership of WTO would also impose costs on the Pacific island countries, these might be minimized through common representation in Geneva.

Regional organizations also exist to provide benefits to their members and to encourage outward-oriented attitudes between the

Government and the private sector. The Pacific island countries might consider increasing their level of involvement in the Pacific Economic Cooperation Conference (PECC). The PECC encourages a process of "open regionalism" amongst its members through the work of its various task forces. These cover many areas of current or future concern to the Pacific island countries, including food and agriculture, trade policy, fisheries, minerals and human resources development. Greater involvement on the part of the Pacific island countries can be seen as part of the general "upskilling" required as their economies become more export-oriented, through information exchanges with and exposure to the ideas of business people, government officials and academics from throughout the region.

APEC (Asia-Pacific Economic Cooperation) recognizes the growing interdependence among the diverse economies of the region, and seeks to intensify Asia-Pacific development cooperation and trade and investment liberalization. Its activities are aimed at enhancing the prospects of an accelerated, balanced and equitable economic growth in the Asian and Pacific region, as well as globally. Because of their central location within the Pacific, APEC will need to develop its relationship with the Pacific island countries[14] in order to create a means of involving those countries in APEC activities and work programmes. At the same time, the Pacific island countries need to increase their awareness of the benefits that are to be obtained from involvement in APEC. Such involvement provides further encouragement to the Pacific island countries to adopt outward-looking policies, and to ensure their interests are not overlooked as the APEC process evolves further, perhaps to include trade liberalization negotiations. As the South Pacific Forum Secretariat already has observer status in APEC, the Pacific island countries may wish to indicate through the Forum their interest in becoming actively involved in APEC working groups and cooperative programmes. The latter include such relevant areas as human resources development, cooperation in science and technology, promotion of small-scale enterprises and improvement of the economic infrastructure.

14 Only Papua New Guinea is currently a member of APEC.

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For more information, please contact:

Director
International Trade and Economic Cooperation Division
Economic and Social Commission for Asia and the Pacific
(ESCAP)
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200 Thailand
Tel: + 66 2 288-1234
Fax: + 66 2 288-1000
Email: inf.unescap@un.org