The Impact of Multilateral Trade Liberalization on Food Security in Sub-Saharan Africa and South Asia

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ABSTRACT

The number of hungry people in Sub-Saharan Africa and South Asia is increasing, putting the Millennium Development Summit (MDG) goal of halving world hunger by 2015 at risk. Progress in reducing hunger in these two regions in the next decade is the key to achieving the MDG goals.

This paper uses a computational general equilibrium (CGE) model to assess the impact of trade liberalization on food security in these two regions. Several scenarios have been designed to examine how different trade policies giving special treatment to Least Developed Countries (LDCs) could potentially influence the impact of globalization on welfare and food security in Sub-Saharan Africa and South Asia. The results generated by CGE have been used to calculate the changes in the number of hungry people by using food balances, food distribution and minimum nutrition requirement databases for each country/region.

The results of the food security indicators suggest that the impact of agricultural trade liberalization on food security is negative in both regions. These indicators improve significantly and become positive with the implementation of trade reforms consistent with the country's developmental stages. In most cases, the impact of trade liberalization on food production and food availability is positive. Consequently, the number of hungry people will be reduced with greater trade liberalization.

Trade reforms in the manufacturing sector have opposing influences on food security in the two regions: with a significantly positive affect on food security in South Asia, but a substantially negative affect on that of Sub-Saharan Africa. This result strongly suggests that very far-reaching preferential policies for Sub-Saharan Africa and non-trade support (such as development aid) are required to improve, or at the very least to prevent the situation from worsening, the food security with trade liberalization in the manufacturing sector.

* The opinions expressed in this paper only reflect those of the authors, while they do not reflect those of FAO or its member governments.

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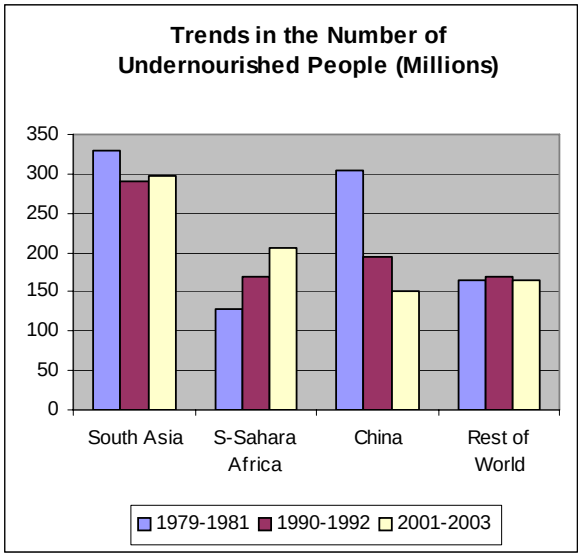
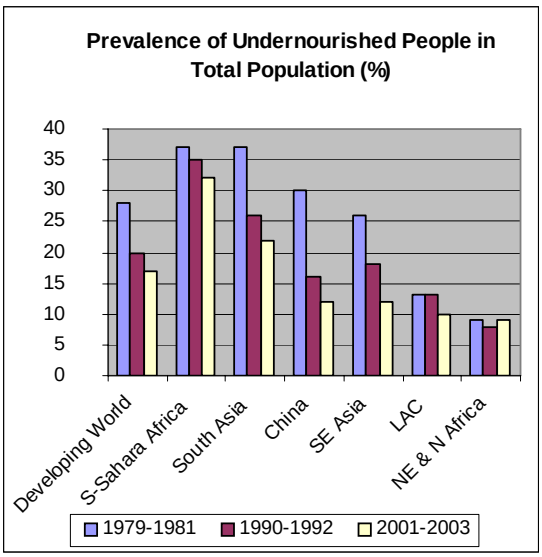
1. INTRODUCTION

The World Food Summit (WFS) in 1996 and the Millennium Development Summit (MDG) in 2000 set goals for cutting world hunger in half between the years 1990 and 2015. The target date is approaching, but the targets themselves are in jeopardy. Based on the Food and Agriculture Organization (FAO)'s estimate, there were still 820 million undernourished people in 2000-2002 in the developing world (34 million in developed countries), a figure that has barely changed from the 823 million in 1990-1992 (SOFI 2005).

Most of the hungry people in the world live in South Asia (SA), Sub-Saharan Africa (SSA), and China (Figure 1). The number of people going hungry in China has been reduced significantly, but has risen in South Asia and Sub-Saharan Africa since 1990-92. As a result, China's share of the world's hungry population had declined from 24 percent to 18 percent from 1990-92 to 2000-2002, but that of South Asia had increased from 35 percent to 36 percent and of Sub-Saharan Africa from 21 percent to 25 percent during the same period. South Asia and Sub-Saharan Africa in 2000 to 2002 still have a much higher prevalence of hungry people compared to other regions (Figure 2). Based on the Global Information and Early Warning System on Food and Agriculture (GIEWS) of FAO, as of April 2006, 42 countries (19 from Sub-Saharan Africa and 3 from South Asia) around the world faced serious food emergencies requiring international food assistance.

With the slow pace of progress achieved since 1990-92, prospects for reaching the World Food Summit goal of halving the number of hungry people by 2015 appear increasingly remote. The progress in reducing the hunger in these two regions will be a key to achieving the hunger reduction targets of the MDGs and WFS.





International trade can have a significant impact on reducing hunger and poverty in developing countries. Freer trade allows access to larger markets and opens up opportunities for specialization in production and economies of scale. However, free trade can have a negative impact on food security in some developing countries, which are net food importers and/or have a preferential market access to developed countries currently. Non-trade issues like food security and rural development have gained greater prominence in the ongoing round of World Trade Organization (WTO) negotiations. At Doha, WTO members committed themselves both to reducing export subsidies and domestic support and to enabling "the developing countries to effectively take account of their development needs, including food security and rural development". In Hong Kong, distinct progress was made on cotton and with the LDCs' long-standing request for duty- and quota-free market access.

This study analyzes the impact of trade liberalization based on the assumptions of four different scenarios on food security in Sub-Saharan Africa and South Asia. Indicators on food security covered in this analysis include market prices, household income, food production and food availability, food import bills and export earnings. The impact on the prevalence of undernourishment in total population and the number of hungry people are assessed by linking the Global Trade Analysis Project (GTAP) results of production and trade, to the FAO country level-of-food balance sheets, and food security statistics database on the minimum dietary energy requirement, and the coefficient of variation on food distribution.

Section 2 provides the background on the link between trade and food security, the indicators on food security, and methodology and procedures used for the estimate of the total number of hungry people; Section 3 presents the GTAP model and scenarios for the simulation; Section 4 focuses on the results of simulation and impacts on food security indicators and the number of hungers. Concluding remarks appear in section 5.

2. TRADE LIBERALIZATION AND FOOD SECURITY

2.1 Monitoring Food Security

FAO defined the goal for world food security as " to ensure that all people at all times have both physical and economic access to the basic food they need" (FAO, 1983). There are household, national and global dimensions of food security. Adequacy of food at the global level requires an effective trading system for ensuring adequate supplies for food-deficit countries. The food security at a country level depends on the country's ability to import food when the domestic production cannot meet food consumption requirement, while household-level food security is determined by both physical access to food and adequate purchasing power.

Sharma (1992) has identified indicators that could be used for monitoring household-level food security as a composite index of household access to food, including per caput food production, per caput export earnings, a sub-index of spatial price differentials, degree of deviation of per caput agricultural production from trend, per caput GDP, income distribution, budget allocation for targeted income transfers and food subsidies, and a sub-index of food price inflation relevant for low-income households. FAO Committee on World Food Security assesses the world food security situation within the context of the three main pillars of food security: availability, access and stability (FAO 2004). Based on the availability of variables in GTAP, the following indicators will be used to measure the impacts of trade policies on a country/region's food security:

- Household Income
- Land Value and Wage of Unskilled Labor
- World and Domestic Market Prices
- Food Import Bills and Export Earnings
- Food Production and Per Capita Dietary Energy Supply
- Number of Undernourished People

2.2 Global Trade and Food Security in LDCs

There are many reasons for food insecurity (FAO 2005; GIEWS/FAO 2006). Although the food security problem cannot be solved by trade policies alone, a reduction or elimination of trade-distorting policies can contribute considerably to establishing an enabling international environment for trade and development in the poor countries. The least developed countries (LDCs) are defined AS a group of 50 countries that have been identified by the United Nations as " least developed" in terms of their low gross national income per capita, their weak human assets and their high degree of economic

vulnerability. The current round of trade negotiations under the WTO (the Doha Round) has objective, substantial trade-related policy reforms in the agricultural sector. These reforms may have substantial impacts on food security on LDCs and should not constrain the poorest countries' ability to realize their production potential and ability to access the world food market.

The trend in the ratio of food imports to foreign exchange earnings in many LDCs are far from sustainable, significant growth in their exports and expansion of domestic food production is needed. There are many biased policies existing against agriculture in food insecure countries. It is important to remove these unfavorable policies by OECD countries. Most LDCs undertook deep trade liberalization in the 1990s. They also received some degree of preferential market access from developed and developing counties. Some concerns the erosion of these treatments may hurt the LDCs economy (Ismail 2006). More effective market access preferences for the LDCs complemented by new supply-side preferences in the new regime may be needed for the food security improvement in LDCs.

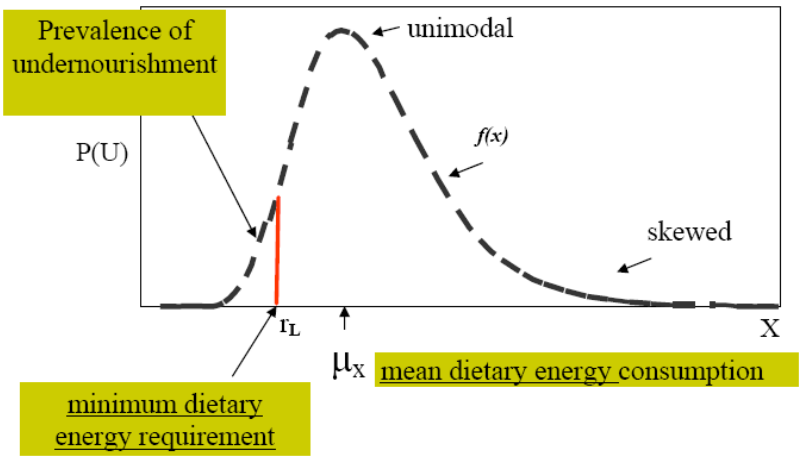
2.3 Methodological Framework and Estimation Procedures for the Number of Hungry People

In this study, we will follow the FAO's methodological framework in measuring food deprivation (FAO 2003), referred TO as the prevalence of undernourishment. FAO has been monitoring progress towards the target of halving the number of undernourished and regularly updating the estimates of the countries in food crisis at the global as well as country level and reporting on "The State of Food Insecurity in the World" (FAO 2005). The proportion of the population below minimum level of dietary energy has been estimated within a probability distribution framework:

$$P(U) = P(x<r_L) = \int_{x< rL)} f(x)\, dx = F_x\,(r_L) \qquad (1)$$

Where: P(U) is the proportion of undernourished in total population, (x) is the dietary energy consumption, r_L refers to a cut-off point reflecting the minimum energy requirement, f(x) is the density function of dietary energy consumption, and Fx represents the cumulative distribution function. The area under the curve up to the minimum energy requirement represents the proportion of the population undernourished as in the graph below.

Theoretical distribution of dietary energy consumption



Source: FAO (2003)

F(x) is assumed to be lognormal so that the parameters μ_x and σ_x^2 can be estimated on the basis of the mean dietary energy consumption, $\bar{x}$, and its coefficient of variation, CV(x) as follows:

$\sigma x = [\log e (CV^2 (x) + 1)]^{0.5}$ [2]
and
$\mu x = \log e\, x - \sigma^2 / 2$ [3]
The proportion of population below r_L is then evaluated as follows:
$\Phi [(\log e\, r_L - \mu) / \sigma)]$ [4]
Where: Φ = standard normal cumulative distribution. Thus, the number of undernourished is estimated as follows: Number of undernourished = Φ[.]x total population.

The mean dietary energy consumption is represented by the Dietary Energy Supply (DES) per person, which refers to the food available for consumption during the year, expressed in terms of energy (kcal/person/day). The DES is estimated based on the Food Balance Sheets compiled on the basis of data on the production, imports and exports of food commodities, the available information on stock changes, losses, and types of utilization (feed, seeds, inputs for processing and non-food uses), and derived food available for human consumption. The food component of all commodities is aggregated in terms of energy values. The minimum energy requirement is estimated based on sex and age group. The energy requirement differs between children below age 10 and adolescents and adults.

The procedure in calculating the new proportion and Number of undernourished by using shocked GTAP results: 1) Use the percentage change in food output and food import and export for each sector from the results of GTAP; 2) Recalculate the new mean of dietary energy supply (DES) (kcals/person/day) based on Food Balance Sheets based on the percentages in (1). The procedure of using daily per person DES derived from the food balance has the following advantages: a) FAO daily per person DES database covers all countries of the world and is regularly up-dated in connection with FAO's continuous work programme on supply and utilization accounts and food balance sheets; b) the components in FAO food balance sheets (production, import, export, etc.) can be linked to those in GTAP's output; c) the food sectors in the balance sheets are also easy to match these sectors in the database of GTAP version 6. 3) Estimate the prevalence of undernourished people by linking the daily per person DES estimated in procedure 2, together with the FAO database of the minimum energy requirement and inequality in food distribution (CV) for each country based on the formulas 2 to 4.

3. MODEL AND SCENARIOS

3.1 Model Specification

A modified version computable general equilibrium (CGE) model based on GTAP model (Hertel, 1997) is developed for analysing the multilateral trade liberalization impacts on food security in Sub-Saharan Africa and South Asia. The GTAP model is a comparative static, multi-commodity, multi-region model and has been widely used for analyzing the impacts of trade policy and poverty reduction (UNCTAD (1996), DFID (2000); World Bank (2002); OXFAM (2002); UNDP et al., (2003), Winter (2000); Bannister and Thugge(2001); Bhagwati and Srinivisan(2000); Berg and Krueger (2003)). There IS ALSO A LOT OF LITERATURE ON are also many literature of trade liberalization and poverty reduction using GTAP analysis (for example, World Bank, 2004; Cline 2004).

In our model, the world economy is classified into 20 regions with each representing either a single country or a composite region consisting of many countries (Table 1). The region aggregation is primarily based on the consideration of their importance in food security condition; economic development status; and geographic location.

The aggregated other Sub-Saharan Africa in GTAP covers the following 37 countries: Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mauritania, Mayotte, Niger, Nigeria, Reunion, Rwanda, Saint Helena, Sao Tome and Principe, Senegal, Sierra, Leone, Somalia, Sudan, and Togo. Among them, 28

countries are LDCs and 32 countries belong to Low-Income Food-Deficit Countries (LIFDC). Most countries in the group depend on one or two cash crops for the major source of agricultural export earnings (Annex Table 3). Other South Asia in GTAP includes Afghanistan, Bhutan, Maldives, Nepal, and Pakistan. All five countries in this group are LIFDC. All countries, but Pakistan, are classified as LDCs.

Each region's economy is further divided into 22 sectors or commodity groups with emphasis on food products and their related sectors. According to its comparative advantages, each region produces its own unique variety of commodities using primary factors such as skilled and unskilled labor, capital, land, and natural resources and intermediate inputs of domestically-produced and/or imported products. A representative producer in each region maximizes profit subject to his budget constraint. The production process is represented by a nested constant elasticity of substitution (CES) structure. Each primary factor is supplied to industries from its fixed regional endowment. We assume that skilled and unskilled labor and capital are mobile between industries, while land and natural resources are immobile. Therefore, wages for each category of labor and the user price of capital are uniform across industries, but the rental prices of land and natural resources can vary.

Table 1. Countries, regions, products and endowments

Countries/regions	**Products**
1. USA	1. Paddy rice (pdr)
2. European Union (15)	2. Processed rice (pcr)
3. Japan	3. Wheat (wht)
4. China	4. Other cereal grains (gro)
6. Brazil	5. Vegetables, frit, nuts (v_f)
7. South Africa	6. Oil seeds (ods)
8. India	7. Vegetable oils and fats (vol)
9. Bangladesh	8. Sugar cane, sugar beet (c_b)
10. Rest of South Asia	9. Sugar (sgr)
11. Madagascar	10. Plant-based fibers (pfb)
12. Uganda	11. Other crops (ocr)
13. Rest of Sub-Saharan Africa	12. Cattle, sheep, goats, horses (ctl)
14. Malawi	13. Other animal products (oap)
15. Mozambique	14. Meat: cattle, sheep, goats, horse (cmt)
16. Tanzania	15. Other meat products (omt)
17. Rest of SADC	16. Raw milk (rmk)
18. Rest of Southeast Asia	17. Dairy products (mil)
19. Rest of Oceania	18. Wool, silk-worm cocoons (wol)
20. All other regions	19. Beverages and tobacco products (b_t)
	20. Other food products (ofd)
	21. Manufactures (mnfcs)
	22. Services (svces)

Commodities produced in each region are either used to meet domestic demand (as intermediate inputs in production or final products in consumption) or exported to other regions. Both intermediate and final products from different regions are considered to be imperfectly substitutable with each other (Armington, 1969). From the demand side, a representative consumer in each region maximizes utility subject to its budget constraint. The final demand in each region consists of investment, government consumption, and private consumption, each of which consumes composite commodities that are CES

combinations of domestic and imported varieties. Government consumption is determined by the maximization of a Cobb-Douglas utility function. A constant-difference-elasticity (CDE) utility function is used for determining private consumption. And flows of global capital are directed by higher return of interest rates.

Savings are assumed to finance investments at the global level. Global saving is the sum of regional savings. The rate of returns from capital determines the capital investment and flows. The current account is not necessarily balanced for each country/region from a global point of view. If savings exceed investments for one country, then it has a trade surplus; otherwise it has a trade deficit. Finally, transportation costs are accounted for by using the difference between the f.o.b. (free on board) and c.i.f. (cost, insurance, and freight) values. The general structure and behavioral equations of the GTAP model can be found in Hertel (1997).
In the current version of GTAP, comprehensive data for tariffs, domestic support and export interventions are based on 2001. However, the major development in trade policy since 2001 is undertaken (Hertel and Winters 2005). These include: tariff reforms undertaken by newly acceding WTO Members-most notably China, EU enlargement to 25 countries, the phase-in of remaining Uruguay Round commitments by developing countries, and phase-out of export quotas on textiles and apparel under the Agreement on Textiles and Clothing.

3.2 Scenarios

The scenarios are designed to analyze two sectors' trade liberalization: agriculture trade liberalizations along with trade liberalizations in both agricultural sector and manufacturing sectors, with each having four scenarios: a) full trade liberalization, b) partial trade liberalization with different treatment to developed countries and developing countries, c) same shocks as in b), with differential treatment to a more advanced developing countries and LDCs, and d) based on the scenario c) with special treatment on cotton.

Since the negotiations have not reached a consensus in many areas, scenarios designed in this study to analyze a range of ideas for trade liberalization, especially relating to the concerns to LDCs. In the ongoing WTO negotiation, developing countries are under immense pressure to reduce their trade barriers to the entry of agricultural products. However, debates within the negotiations are increasingly reflecting concerns that economic growth prospects in some countries, especially LDCs, may be hindered by opening their agriculture sectors too extensively and too quickly; appropriate level of import protection consistent with agriculture led development may be needed to advance poverty reduction and improved food security (Morrison and Sarris 2006). As well as a full trade liberalization scenario, other three scenarios are designed to reflect the different treatments of developed countries, more advanced developing countries, and LDCs.

There is a substantial binding overhang in tariffs and domestic support in agriculture. The bound tariffs are much higher than those applied (in developing countries: 48% vs. 21% on average, LDCs: 78% vs. 13%, EU: 21% vs. 12%, USA 6% vs. 3%). Therefore, bound tariffs can be cut deeply with impact on applied protection and hence international trade in many countries. Instead of cutting bounding tariffs, scenarios in this study calculate the tariff reductions based on the applied tariffs used in GTAP models, with the purpose to identify the impacts from the real cut.

Both agriculture and nonagricultural market access have been agreed in the Hong Kong Declaration to have a comparably high level of ambition reduction. Therefore, another four scenarios were designed to include trade policy reforms in both agricultural sector and manufacturing sector. The tariff cuts in manufacturing sector are treated the same as those in agriculture sector in all scenarios. We do not consider the liberalization in service sectors since most barriers to trade in services are complicated and hard to be reduced by a formula and also because most deals from WTO are formed in a series of bilateral bases (Polaski 2006).

Table 2. Policy Shocks

Scenario		**Shocks**[1]
One: Fully free trade liberalization (all countries are treated the same)	**Sce1a**: agriculture along	**Domestic Subsidies/Taxes** 100% reductions in all countries **Market Access** (tariffs) 100% reductions in all markets
	Sce1b: both agri. and menufacutre	Shocks are the same in both sectors
Two: Base Scenario (developed countries and developing countries are treated differently)	**Sce2a**: agriculture along	**Domestic Subsidies/Taxes** 60% in developed countries 40% in all developing countries **Market Access** (tariffs) 60% in developed countries 40% in all developing countries
	Sce2b: both agri. and menufacutre	Shocks are the same in both sectors
Three Special Treatment on LDCs	**Sce3a**: agriculture along	**Domestic Subsidies/taxes** Same as in Scenario two, but no cut in LDCs **Market Access** (tariffs) Same as in scenario two, but (a) no cut for goods to LDCs and (b)100% cut in developed countries for goods from LDCs (free access)
	Sce3b: both agri. and menufacutre	Shocks are the same in both sectors
Four: Special Treatment of Cotton on LDCs	**Sce4a**: agriculture along	**Domestic Subsidies/taxes** same as in scenario three, but 100% cut on cotton in Developed countries **Market Access** (tariffs) same as the scenario three, but 100% cut on cotton in other developing countries (free access)
	Sce4b: both agri. and menufacutre	Shocks are the same in both sectors

Note: [1]/Export subsidies/taxes are 100% removed in all scenarios; all reductions are made from applied rates; no reduction on service sectors.

As usual, a full trade liberalization scenario is conducted as a reference point to show a maximum potential situation to remove all policy distortions in agriculture and manufactured goods in all countries/regions. The scenario two treats developing countries differently from developed countries, requiring 60% reductions in applied tariffs and domestic subsidies/taxes by developed countries and 40% reductions by developing countries. The third scenario provides a special treatment given to LDCs with free market access to developed countries' markets for goods from LDCs, but no reductions for goods to LDCs from all other countries. All shocks in the last scenario (Scenario four) are the same as those in scenario three, but constructed to have free market access for cotton from LDCs to other

developing countries and cut all domestic subsidies on cotton in the developed countries. The detailed shocks on three pillars of policies are summarized in Table 2.

4. RESULTS

For the purpose of this study, we present the simulated results only on Sub-Saharan Africa and South Asia. In the first part, we briefly discuss the impacts on welfare. Following that, we show the results on major food security indicators: household income and factor prices; world and domestic commodity prices; food import bills, export earnings, and trade balance; and food production and food availability. Finally, the impacts on the prevalence of undernourishment in total population and on the number of undernourished people will be discussed.

4.1 The impact on total welfare

Table 3 shows the welfare analysis, which is measured by Equivalent Variation (EV). Welfare can be further decomposed into many components, two of these major components which affect EV are terms of trade and allocative effect . Our results indicate that the welfare impacts are different in two regions: there are strong positive impacts (welfare gain) in South Asia, while significant negative impacts (welfare losses) in Sub-Saharan Africa, with only a few exceptions. In most of the cases, the terms of trade effect is negative, but total contribution of region EV of allocative effects is positive in both regions. In order to improve welfare, improving terms of trade effect in these two regions can be the next step.

Under the full trade liberalization with both agricultural and industrial reforms, the other Sub-Saharan group, representing the majority of this region, suffers a big loss at 1.4 billions dollars as the preferential market access were totally eroded, resulting in a negative terms of trade effect (in Table 3). This result is consistent with other findings (Polaski 2006). The welfare loss in Sub-Saharan Africa would be reduced to less than half of that in scenarios where the trade is partially liberalized. This big reduction in the welfare losses results from the two differences in policy shocks: a) reduced overall reduction in domestic subsidies and import tariffs and b) lower reductions of market access to developing countries. When more preferential market access is granted to LDCs, the welfare losses in Sub-Saharan Africa would be further reduced significantly, indicating the need to determine the appropriate level of import protection consistent with agriculture led development in order to increase economic growth and poverty reduction in LDCs. The special preferential treatment on cotton trade to LDCs would have also positive impacts on the welfare of Sub-Saharan Africa.

By contrast, results suggest that South Asia will gain from the trade liberalization in all scenarios with reforms in both agricultural and industrial sectors. Similar to the case of Sub-Saharan Africa, Bangladesh will benefit from special treatment to LDCs, but it will not be good for other countries in South Asia. In the case of agricultural trade liberalization, the magnitude of the gain is much smaller compared to those with the reforms in both sectors. Results of the agricultural reforms without manufacturing sector reforms, also show that the special treatment polices to LDCs is not favorable to South Asia in terms of food security and this treatment makes Bangladesh further worse off.

Table 3. Change in total welfare

Welfare (EV), Mil $, deviated from baseline (d.f.baseline)								
	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
South Asia								
IND	1495.1	608.7	488.8	483.6	5749.5	2925.3	2062.2	2056.5
BGD	77.1	16.3	-41.9	-42.5	528.4	226.2	285.1	284.4
Other SA	149.9	50.1	-16.3	-17.5	1388.2	863.7	848.9	847.7
Sub-Saharan Africa								
UGA	-20.1	-9.3	-4.0	-3.2	-38.3	-17.7	-6.9	-6.0
MDG	-14.5	-7.2	-5.4	-5.2	2.5	4.0	25.7	25.9
Other SSA	20.6	-66.7	-67.4	-57.1	-1439.3	-647.7	-560.1	-549.3
Terms of Trade (CNTtotr, mil $, (d.f.baseline)								
	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
South Asia								
IND	-367.4	-127.5	-186.7	-193.4	-1890.4	-597.3	-585.7	-592.7
BGD	-38.9	-30.3	-31.9	-33.2	-198.4	-92.1	123.2	121.8
Other SA	-93.4	-44.3	-2.7	-3.2	-77.4	-33.7	263.1	262.6
Sub-Saharan Africa								
UGA	-14.4	-6.8	-2.5	-1.9	-19.6	-9.6	-3.7	-3.2
MDG	-12.8	-6.3	-4.5	-4.4	-7.0	-3.2	12.4	12.6
Other SSA	-288.9	-189.8	-48.1	-40.2	-2041.7	-935.0	-345.0	-336.8
Total Contribution of regional EV of Allocative Effects (CNTalleffr, mil $, d.f. baseline)								
	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
South Asia								
IND	1852.6	731.9	665.6	667.0	7291.7	3321.9	2434.5	2435.8
BGD	112.4	46.2	-7.3	-6.3	725.3	305.7	87.5	88.5
Other SA	245.6	95.2	-14.9	-15.6	1414.1	858.5	535.7	535.0
Sub-Saharan Africa								
UGA	1.1	0.2	-0.8	-0.7	2.5	0.7	-1.4	-1.4
MDG	0.5	0.2	0.0	0.0	8.6	5.1	6.2	6.2
Other SSA	338.4	133.2	-24.9	-23.0	1232.1	509.0	-212.1	-210.2

Source: authors' simulation results

4.2 The impact on food security indicators

Impact on household income and factor prices

Household income is an indicator of poverty and market access to food. Higher income can improve the food security by increasing the purchase power of the households.

The changes of household income are reported in Table 4. In South Asia, the negative signs of changes under full trade liberalization and base partial trade liberalization with agricultural reform excluding manufacturing reforms (sce1a and sce2a) indicate the deteriorated situation in terms of food security. These signs in other South Asian countries turned into strongly positive in scenarios 1b and 2b, suggesting that they would significantly benefit from the trade liberalization in manufacturing sector.

Similar to the cases in South Asia, the household income in Sub-Saharan Africa declined under full

trade liberalization and base partial trade liberalization with agricultural trade reform not including industry reforms (sce1a and sce2a). But different from those in South Asia, the signs become significantly negative in scenarios 1b and 2b, indicating that the food security in term of household income is badly hurt by the reforms in the manufacturing sector.

Results show the similar strong positive impacts of special treatment given to LDCs and cotton policy on household income in South Asia and Sub-Saharan Africa with the exception of India. The food security in terms of household income in LDCs can be substantially improved by special treatment in policies on the poorest countries and cotton policies, compared to the cases of the reforms without these preferential policies based on their special development stages.

Under the scenarios with the reforms in both agriculture and manufacture, the special treatment reforms can reverse the loss in the household income to the gain in Bangladesh and Madagascar, can significantly increase the gain in the group of other South Asia, and can significantly reduce the loss in the group of other Sub-Saharan Africa. Under the scenarios with the agriculture reforms minus manufacturing, the household income in other South Asian group and in other Sub-Saharan African group will switch from loss to gain, while the magnitude of the loss in Bangladesh, Uganda, and Madagascar are significantly reduced.

The special treatment policies on LDCs have almost no impact on India's household income under the scenarios with the reforms in both agricultural sector and industrial sector and small negative impacts under the scenarios with the reforms in agriculture, reflecting the fact that India is not a least developed country.

Table 4. Change in regional household income (Y), %, deviated from baseline

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
South Asia								
IND	-0.96	-0.25	-0.28	-0.28	-1.27	0.10	0.11	0.10
BGD	-1.16	-0.50	-0.13	-0.12	-2.95	-1.12	2.03	2.04
Other SA	-1.60	-0.50	0.31	0.32	2.29	3.13	5.19	5.20
Sub-Saharan Africa								
UGA	-3.18	-1.26	-0.17	-0.09	-7.28	-3.33	-1.67	-1.59
MDG	-1.83	-0.77	-0.46	-0.43	-2.79	-0.84	1.25	1.27
Other SSA	-1.84	-0.60	0.23	0.26	-8.07	-3.48	-1.94	-1.91

Source: authors' simulation results

In order to identify the income distribution effect on food security, it would be useful to look at the change in market price of major primary factors, especially land and labors and the simulation results are reported in Table 5. The results reflect mixed effects, depending on the scenarios and countries.

The land prices in other Sub-Saharan Africa would have significant increases in all scenarios. This result may indicate an improvement in food security for poor, smallholder farmers. The social rules of a community (or customary law) in many African countries oversee the use and ownership of common property and can provide poor households with greater access to land and tenure security (CAPRI 2006). However, the most vulnerable and marginalized rural groups in Africa often lack access to land (CAPRI 2004). Ensuring land rights to these farmers can improve their household income and basic level of food security as the trade liberalization can increase the land price.

With the exception of the case in India, the special reform treatment on LDCs and cotton has a substantial positive impact on land value in both regions. For example, the increase rate can be more than doubled in other Sub-Saharan Africa.

Agricultural trade liberalization results in the decline in wages for unskilled labor in all

countries/groups in two regions, exception in Bangladesh, with negative signs. Similar to land value, the special policies to LDCs can significantly improve the wages of unskilled labors, turning to the positive for other South Asia and Other Sub-Saharan Africa. This result suggests the importance of these special policies in favor of LDCs on food security in these countries, since the majority of food-insure households are engaged in activities with unskilled labors.

The impact of trade liberalization in the manufacturing sector on unskilled labor wage varies between Sub-Saharan Africa and South Asia, with a strong positive in the former, but negative in the latter, indicating that additional development aid is needed to prevent the deterioration in food security in Sub-Saharan Africa during the course of trade reforms in industrial sector.

Table 5. Change in market price of factors, %, deviate from baseline

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
India								
Land	-11.10	-3.63	-3.87	-3.82	-10.27	-3.03	-3.27	-3.32
UnSkLab	-1.08	-0.37	-0.39	-0.40	2.29	1.40	1.32	1.32
SkLab	-0.52	-0.19	-0.20	-0.21	3.18	1.69	1.56	1.56
Capital	-0.61	-0.22	-0.23	-0.24	2.87	1.60	1.52	1.53
NatRes	0.55	0.15	0.19	0.17	3.38	1.87	2.11	2.12
Bangladesh								
Land	-2.44	-0.35	1.52	2.05	0.95	1.33	3.71	4.24
UnSkLab	0.27	0.06	-0.22	-0.23	0.97	0.31	1.78	1.76
SkLab	0.32	0.06	-0.27	-0.30	1.19	0.35	1.7	1.67
Capital	0.31	0.06	-0.26	-0.28	0.84	0.25	1.75	1.72
NatRes	1.14	0.38	-0.15	-0.22	-0.92	-0.3	2.07	2
Other South Asia								
Land	-11.38	-3.61	3.02	3.22	-9.26	-2.16	4.94	5.13
UnSkLab	-1.11	-0.41	0.07	0.06	5.7	4.53	5.25	5.24
SkLab	-0.60	-0.26	-0.09	-0.11	6.49	4.77	4.99	4.98
Capital	-0.68	-0.28	-0.05	-0.07	6.27	4.79	5.28	5.26
NatRes	0.99	0.28	-0.31	-0.34	8.49	6.39	6.87	6.83
Uganda								
Land	-3.40	-1.16	0.00	0.20	-3.60	-1.41	-0.23	-0.02
UnSkLab	-2.06	-0.76	-0.13	-0.04	-4.97	-2.31	-1.49	-1.39
SkLab	-1.74	-0.70	-0.22	-0.17	-5.21	-2.57	-1.99	-1.94
Capital	-1.44	-0.58	-0.20	-0.15	-5.46	-2.67	-2.01	-1.96
NatRes	1.62	0.56	0.01	-0.07	-8.47	-4.10	-2.82	-2.90
Madagascar								
Land	-9.67	-3.56	-1.82	-1.62	-9.48	-4.07	-3.34	-3.13
UnSkLab	-1.81	-0.75	-0.53	-0.50	-1.92	-0.49	1.00	1.02
SkLab	-0.94	-0.46	-0.41	-0.40	-1.08	-0.15	1.39	1.40
Capital	-0.57	-0.29	-0.27	-0.27	-0.72	0.13	1.79	1.79
NatRes	0.83	0.32	0.21	0.19	0.72	1.03	3.08	3.07
Other Sub-Saharan Africa								
Land	2.23	1.95	5.08	5.41	7.00	4.31	8.16	8.50
UnSkLab	-0.68	-0.14	0.37	0.41	-0.98	-0.71	-1.52	-1.48
SkLab	-0.94	-0.33	0.00	0.02	-0.63	-0.72	-2.24	-2.23
Capital	-0.72	-0.26	-0.02	-0.02	-1.78	-1.21	-2.34	-2.33
NatRes	0.70	0.11	-0.36	-0.38	-3.62	-2.22	-3.13	-3.15

Source: authors' simulation results

Impact on world and domestic market prices

As shown in Annex Table 6, the trade liberalization would result in different impacts on world export prices and domestic supply market prices. Proposed reductions in domestic support for agriculture by high-income countries under scenarios would tend to lower world production and drive up prices of grains, oil seeds, and cotton etc. when demand remains steady. But prices of beverages and tobacco would decrease significantly; those for other animal products, other food products, etc. decrease slightly. The overall scenarios, reflecting different levels of trade policies, produce similar changes in the patterns of prices for different commodities, driven mostly by agricultural trade policy reforms.

The world market price changes are not transmitted to individual countries fully and consistently, due to different existing trade policies and assumptions for the reforms. The impacts on export prices by regions are reported in Annex Table 7, showing that trade liberalization would reduce the export prices for almost all commodities for all countries/regions in Sub-Saharan Africa and South Asia, in the scenarios where special treatment is not given to LDCs. The changes of export prices of most agricultural products under the special treatment scenarios become positive in other Sub-Saharan Africa, Other South Asia, and Bangladesh; still negative, but reduced in magnitude in Madagascar and Uganda; and almost no change in India.

The impacts of the export price changes on food security in different countries/regions are different as a result of the importance of specific commodity in total export earnings, as shown in Annex Table 8. The prices in other crop groups, including coffee, tea, and cocoa, are the most important in terms of export earnings in Madagascar (over 80% in value) and Uganda (over 50%). Without special treatment of LDCs in agricultural trade reforms, both countries will experience a reduction in export earnings of these commodities. Similarly, the prices in other crop groups are extremely important in terms of export earnings and food security in the following countries in the other Sub-Saharan Africa: Burundi, Comoros, Equatorial Guinea, Ghana, Nigeria, Rwanda, Sao Tome and Principe, and Sierra Leone; also in Sri Lanka, which is in the other South Asia group.

The results show that the changes in prices of plant-based fibers in other Sub-Saharan Africa would be negative without special treatment policies, but positive in scenarios with special treatments of LDCs (0.93% increase) and with the addition of special treatment given to cotton (1.17%). These results indicate a significant importance of special policies on food security to the following countries: Benin, Burkina Faso, Mali, Chad, and Togo. The shares of export fiber in total agricultural export earnings are 71%, 75%, 63%, Chad, and Togo, respectively, in these five countries, based on the five-year average from 2000 to 2004.

Strong positive price impacts on oil seeds would have a significantly positive effect on the export earnings and food security in the following countries: Eritrea, Sudan, and Gambia.

The impacts of trade liberalization on market prices of commodities vary significantly among regions/countries, reflecting the price differences and existing trade policies in 2001-03. It is interesting to find that the market prices of almost all commodities, with the exception of wheat, in Uganda and the other Sub-Saharan Africa would decline in all scenarios, while the opposite is true in the other South Asia group. The market price impacts in Madagascar and Bangladesh would depend on the scenarios. Without special treatments for LDCs, the trade liberalization would reduce the market prices of most commodities in these two countries. The impacts on India are mixed and the pattern is much similar to those of world market prices.

Food securities for many small producers in Sub-Saharan Africa would deteriorate from the lowered food prices, but the situations of food security for producers in most countries in South Asia would benefit from the higher market prices, due to the importance of agriculture in people's income and employment.

The results show that the impacts of market access shocks on import and expert prices in South Asia

and Sub-Saharan Africa are quite different, in favor of South Asian region, but unfavorable to Sub-Saharan Africa because of preference erosion to the latter, where the export prices for agricultural commodities would decline, but import prices would increase. For South Asia, both export prices and import prices would be higher, but with a greater increase to export prices.

The impact of trade policy reforms on import prices for major cereals is presented in Annex Table 9. The cereal prices in all scenarios for all countries/regions are positive, especially in Madagascar and Uganda, indicating a negative impact on food security since most countries in Sub-Saharan Africa and South Asia are net food/cereal importers. The share of cereal import bill in total agricultural import bills is high (Annex Table 4) and over 40% in the following countries: Burundi, Eritrea, Ethiopia, Guinea-Bissau, Madagascar, Somalia, and Sudan.

Impact on food import bills and export earnings

Table 6 provides the food import bills, the percentage changes in ratios of food import bills in agricultural export earnings and total export warnings. Trade liberalizations reduce the food import bills in Madagascar and Uganda as a result of a higher cereal import prices, causing consumption and also imports to contract and domestic cereal production to increase. However, the lower agricultural export prices discourage the agricultural export much more compared to the food imports. Consequently, the ratio of food import bills to total agricultural export earnings increased. In contrast, a relatively much lower increase in cereal import prices, compared to Madagascar and Uganda, leads to higher food import bills and a decrease in its ratio in total agricultural export earnings. ??

Following the food import pattern in Madagascar and Uganda, the food import bills in Bangladesh decline in all scenarios, but its ratio to agricultural export earnings decline as well, reflecting the relatively smaller change in agriculture export prices to the food import prices.
The situation in South Asia is more complicated. The direction of changes in food import bills varies by country and also by scenarios. But the ratios to agricultural export earnings decline in all scenarios.

As for the ratio of food import bills in total export earnings, there is no consistent direction. But in general, agricultural trade policy reforms lead to the declining of this ratio, with the exception of two scenarios in Sub-Saharan Africa; manufactured trade reform, combined with agricultural reforms, results in higher ratios in the other South Asia group and other Sub-Saharan Africa, and India.

Table 6. Percentage Changes in Food Import Bills and Its Ratios to Ag Export Earnings and Total Export Earnings

	South Asia			Sub-Saharan Africa		
	India	**Bangladesh**	**Other SA**	**Uganda**	**Madagascar**	**Other SSA**
Food Import Bills						
Baseline	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sce1a	105.3%	99.9%	93.4%	98.2%	86.2%	111.0%
Sce2a	102.7%	97.5%	93.5%	99.1%	92.0%	104.4%
Sce3a	99.7%	88.8%	96.8%	99.4%	88.9%	104.9%
Sce4a	99.7%	88.7%	96.7%	99.1%	88.8%	104.8%
Sce1b	110.8%	99.6%	104.1%	94.3%	88.6%	106.9%
Sce2b	106.4%	98.2%	103.1%	97.5%	94.6%	102.5%
Sce3b	102.6%	94.8%	107.5%	98.5%	95.2%	101.9%
Sce4b	102.6%	94.7%	107.4%	98.2%	95.1%	101.8%
Food Import Bills / Ag Export Earnings						
Baseline	107.7%	90.0%	106.0%	104.8%	103.9%	96.8%
Sce1a	107.6%	80.2%	104.1%	103.7%	102.8%	94.8%
Sce2a	107.6%	85.3%	105.0%	104.1%	103.2%	95.7%
Sce3a	107.5%	86.4%	105.0%	103.8%	103.0%	95.9%
Sce4a	107.5%	84.2%	104.4%	103.4%	102.7%	95.5%
Sce1b	107.6%	80.3%	104.0%	103.8%	102.8%	95.0%
Sce2b	107.7%	85.6%	105.0%	104.2%	103.3%	95.8%
Sce3b	107.6%	86.9%	105.1%	104.0%	103.1%	96.0%
Sce4b	107.5%	84.8%	104.6%	103.5%	102.8%	95.5%
Food Import Bills / Total Export Earnings						
Baseline	12.1%	5.1%	12.0%	58.7%	36.4%	17.8%
Sce1a	9.4%	3.9%	8.4%	57.2%	29.1%	17.4%
Sce2a	10.9%	4.4%	9.6%	58.2%	32.1%	17.8%
Sce3a	10.9%	4.2%	10.3%	58.6%	30.7%	19.0%
Sce4a	10.9%	4.2%	10.3%	58.5%	30.7%	19.0%
Sce1b	12.9%	5.0%	12.0%	55.5%	32.6%	18.4%
Sce2b	12.7%	5.0%	12.2%	57.3%	34.6%	18.1%
Sce3b	12.3%	4.8%	12.8%	57.9%	34.9%	18.2%
Sce4b	12.3%	4.8%	12.8%	57.8%	34.8%	18.1%

Source: authors' simulation results

Impact on food production and food availability (mean dietary energy consumption)

In response to the price changes, the production in different countries would adjust in line with its comparative advantages and new competitiveness of crops in these countries under different scenarios (Annex Table 11 and 12). The other Sub-Saharan Africa region expands its production of oil seeds (from some 20- 50 %), milk (35%), cotton (10-20%), vegetables and fruits, and rice, but contracts the production of beverages and tobacco products, other food products, coarse grains. The plant-based fiber production expands in all scenarios and in all countries/regions, with the exception of India. In South Asia, the output of vegetable oils and fats decrease, especially in India, where there is currently a high border protection.

The impact of trade reforms on food availability is reported in Table 7 and the results indicate the increase in food availability in most scenarios and countries/regions, with the exception of Madagascar. The changes are the results of net changes in food production and net food trade, and were calculated based on the food balances and simulated results from GTAP.

Table 7. Impact on Food Availability (Mean Dietary Energy Consumption)

Country/region	Baseline	Sce1a	Sce3a	Sce1b	Sce3b
	(kcal/person/day)	Changes (kcal/person/day)			
South Asia	2407	49	5	55	11
India	2443	56	13	54	13
Bangladesh	2198	5	-5	12	2
Rest of SA	2369	46	-28	86	9
Sub-Saharan Africa	2208	83	41	88	51
Madagascar	2037	-31	-8	-37	-22
Uganda	2377	-19	4	46	26
Rest of SSA	2206	92	44	95	55

Source: authors' simulation results

4.3 The impact on the number of undernourished people

Corresponding to the changes in mean dietary food energy, the overall prevalence of undernourishment in the total population in Sub-Saharan Africa and South Asia would decline in most countries/regions (Tables 8 and 9). The total number of undernourished population would be reduced by some 53.3 millions in full agricultural trade liberalization scenario, 16.5 million in partial agricultural trade liberalization with special treatment for LDCs. These two numbers will change and increase to 57.6 million and 23.3 million, respectively, in the scenarios with trade liberalization in both agricultural sector and manufacturing sector. Most cuts in hunger take place in Sub-Saharan Africa.

Table 8. Impact on prevalence of undernourishment in total population

	Baseline	Sce1a	Sce3a	Sce1b	Sce3b
South Asia	21.5%	19.7%	21.3%	19.4%	21.1%
India	20.2%	18.2%	19.7%	18.2%	19.7%
Bangladesh	30.0%	29.7%	30.2%	29.4%	29.8%
Rest of SA	22.4%	20.6%	23.6%	19.2%	22.1%
Sub-Saharan Africa	32.5%	28.2%	30.3%	27.9%	29.7%
Madagascar	38.4%	40.6%	39.0%	41.0%	39.9%
Uganda	18.4%	19.1%	18.2%	16.7%	17.4%
Rest of SSA	32.9%	28.1%	30.5%	28.0%	30.0%

Source: authors' simulation results

Table 9. Impact on the number of undernourished people ('000 persons)

	Baseline	Sce1a	Sce3a	Sce1b	Sce3b
		Changes from baseline			
South Asia	299 000	-25 974	-2765	-28 849	-6 123
India	212 000	-21 377	-5 229	-20 800	-5 106
Bangladesh	43 000	-357	349	-838	-174
Rest of SA	43 000	-3 521	2 212	-6 330	-717
Sub-Saharan Africa	206 000	-27 306	-13 767	-28 760	-17 223
Madagascar	7 000	367	97	430	256
Uganda	5 000	186	-43	-433	-253
Rest of SSA	195 000	-28 330	-14 044	-28 912	-17 357
Total	505 000	-53 280	-16 532	-57 610	-23 346

Source: authors' simulation results

5. CONCLUDING REMARKS

The World Food Summit and the Millennium Development Summit set goals for cutting world hunger in half between the years 1990 and 2015. Many world hunger problems exist in Sub-Saharan Africa and South Asia and the number of hungry people has been increasing in recent years in these two regions. This paper has employed a computational general equilibrium model to assess impacts of trade liberalization on food security in these two regions. In our model, the world economy is classified into 20 regions with each representing either a single country or a composite region consisting of many countries. Each region's economy is divided into 22 commodity groups with an emphasis on food and their related products.

The scenarios are designed to analyze two sectors of trade liberalization. The first is agricultural trade liberalization, within which four scenarios have been included. The second is trade liberalization in both the agricultural and manufacturing sectors, within which a further four additional scenarios has been included. These scenarios include that of full trade liberalization and another three other scenarios designed to reflect the differential treatment given to:

a. developed countries,
b. more advanced developing countries,
c. LDCs.

This paper presents the results of the impact on welfare and the impact on the following food security indicators:

a. household income and factor prices,
b. commodity market prices, food import bills and export earnings, food production and food availability,
c. the number of undernourished people.

Consistent with parallel studies, the results here show that the welfare of Sub-Saharan Africa will suffer from trade liberalization as its preferential market access erodes. In contrast, South Asian welfare will gain from trade liberalization. The results also show that the welfare in Sub-Saharan Africa can be improved with special treatment policies for LDCs.

The impact of trade policies on food security indicators in the group of other Sub-Saharan African countries and the group of other South Asia countries are summarized in Table 10. Fully free agricultural trade liberalization will make food security in both country groups worse off as reflected by the majority of the indicators provided. A little improvement in food security, but still negatively affected, can be seen in partial trade liberalization with separate policies for developed and developing countries. Food security in Sub-Saharan Africa and South Asian countries can be significantly improved with trade policies that give:

a. special treatment to LDCs
b. special treatment on cotton commodity.

The impact on food security resulting from trade reforms in the manufacturing sector in these regions is significantly positive in other South Asian countries, but very negative in Sub-Saharan Africa. This result strongly suggests that very far-reaching preferential policies for Sub-Saharan Africa and non-trade support (such as development aid) are required to improve, at the very least to prevent the situation from worsening, the food security with trade liberalization in the manufacturing sector.

The impact on food security is not uniform within Sub-Saharan Africa. The same can be said for the South Asian region. For example, some population groups in Benin, Burkina Faso, Mali, Chad, Togo, Cote d'lvire, Ghana, and Kenya, which are larger exporters of cash crops, will experience significantly positive effects, as prices increase, with special treatment policies for LDCs and for cotton. However, some population groups in Nigeria, Senegal, Sudan, Ethiopia, Bangladesh, and Sri Lanka which are larger cereal importers will be significantly disadvantaged by trade liberalization as cereal prices will increase. A country-by-country analysis is needed in order to identify the specific development assistance needs for promoting the food security of each country in these regions.

Table 10. Summary of Impacts of Trade Policies on Food Security

	Ag Free Trade	Base Partial	Special Treatment to LDCs	Cotton	Manufacturing Reform
Other South Asia					
Household Income	negative	negative	positive	positive	strong positive
Land Prices	strongly negative	negative	strongly positive	Strongly positive	strongly positive
Unskilled Labor Prices	negative	negative	positive	positive	strongly positive
Commodity Export Prices	negative	negative	positive	positive	strong positive
Grains Import Price	negative	negative	negative & better	Negative & better	negative
Food Import Bills/ Total Export Earnings	positive	positive			negative
Food Production and Availability	strong positive		negative		
No of Undernourished People	strong positive		negative		
Other Sub-Saharan Africa					
Household Income	negative	negative	positive	positive	strong negative
Land Price	positive	positive	strongly positive	strongly positive	strongly positive
Unskilled Labor Prices	negative	negative	positive	positive	strong negative
Commodity Export Prices	negative	negative	positive	positive	negative
Grains import price	negative	negative	negative & better	negative & better	negative
Food Import Bills/ Total Export Earnings	positive	same	negative	negative	negative
Food Production and Availability	strong positive		positive		
No of Undernourished People	strong positive		negative		

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Appendixes

Annex Table 1. Country's Development Stages, Food Trade Status, and Important Cash Crops in SSA and SA

Country	LDC[1]?	LIFDC[2]?		LDC?	LIFDC?
Sub-Saharan Africa (37 countries)	(28 C)	(32 C)	Liberia	Yes	Yes
Madagascar	Yes	Yes	Mali	Yes	
Uganda	Yes	Yes	Mauritania	Yes	Yes
Benin	Yes	Yes	Mayotte		?
Burkina Faso	Yes	Yes	Niger	Yes	Yes
Burundi	Yes	Yes	Nigeria		Yes
Cameroon		Yes	Reunion		
Cape Verde	Yes	Yes	Rwanda	Yes	Yes
C. African Republic	Yes	Yes	Saint Helena		
Chad	Yes	Yes	Sao Tome and Principe	Yes	Yes
Comoros	Yes	Yes	Senegal	Yes	Yes
Congo???	Yes	Yes	Sierra Leone	Yes	Yes
Cote d'Ivoire		Yes	Somalia	Yes	Yes
Djibouti	Yes	Yes	Sudan	Yes	Yes
Equatorial Guinea	Yes	Yes	Togo	Yes	Yes
Eritrea	Yes	Yes	**South Asia (7)**	(5)	(6)
Ethiopia	Yes		India		Yes
Gabon		Yes	Bangladesh	Yes	Yes
Gambia	Yes	Yes	Afghanistan	Yes	Yes
Ghana		Yes	Bhutan	Yes	Yes
Guinea	Yes	Yes	Maldives	Yes	
Guinea-Bissau	Yes	Yes	Nepal	Yes	Yes
Kenya		Yes	Pakistan		Yes

1/ Least developed Countries (total 50 countries) as of 2005, the countries are reviewed by the Economic and Social Council (ECOSOC) of the United Nations, and the criteria are: low income, weak human resources, and low level of economic diversification; 2/ Low-Income Food-Deficit Countries (total 82 countries) as of September 2005, reviewed by FAO mainly based on country's per capita income and net food trade position; 3/ 5-year average from 1998-2002, calculated based on FAOSTAT data.

Annex Table 2. Basic Information on Agriculture and Food Security

	PC GDP	Ag in GDP	Rural Pop	Ag emplo	Poverty Rural	Poverty Urban	Under-nourish	
	2000$	%	%	%	HC%	HC%	%	
Afghanistan			77					
Bangladesh	376	23	76	63	53	37	30	
Bhutan	653	35	92					
India	489	23	72	67	30	25	20	
Maldives	2302	40	72	18			11	
Nepal	228	24	85	79	35	10	17	
Pakistan	540	23	66	46	36	24	23	
South Asia	478	19	72	65			21	
Sri Lanka	893	36	79	37	27	15	22	
Benin	323	32	56		33	23	14	
Burkina Faso	240	50	83		52	19	17	
Burundi	105	44	90		36	43	67	
Cameroon	631	10	49	60	50	22	25	
Cape Verde	1228	56	45					
C African Republic	240	40	58				45	
Chad	200	41	75		67	63	33	
Comoros	378	61	66				62	
Congo, Rep.	85	6	47				72	
Cote d'Ivoire	942	23	56				14	
Djibouti	595	4	17	2			26	
Equatorial Guinea	777	8	53					
Eritrea	3454	15	80	4			73	
Ethiopia	179	45	85	78	45	37	46	
Gabon	106	8	17				5	
Gambia, The	3866	32	74		61	48	27	
Ghana	323	36	55	55	50	18	12	
Guinea	263	24	66				24	
Guinea-Bissau	377	57	67				37	
Kenya	144	29	62	19	53	49	31	
Liberia	419	46	54				49	
Madagascar	162	29	74	78	77	52	38	
Mali	230	37	68		76	30	28	
Mauritania	228	20	40		61	25	10	
Niger	417	39	78		66	52	32	
Nigeria	157	27	54	3	36	30	9	
Rwanda	373	41	83	90	66	14	36	
Sao Tome and Principe	239	19	62				12	
Senegal	345	18	51		40	24	23	
Sierra Leone	438	58	62		79	56	50	
Somalia	147	65	66					
Sub-Saharan Africa	518	18	65				32	
Sudan	401	41	62				27	
Togo	244	38	65				25	
Uganda	256	34	88	69	40	11	19	
World	5330	4	52				16	

Annex Table 3. Share of Export Earnings in Total Ag Export, by Commodity Group

	Ag(m $)	Cereal	Meat	TF	Sugar	CTC	BT	FV	Milk Eq	Oil seeds	Oils Fats
SSA	10853	1%	1%	12%	6%	41%	10%	9%	0%	3%	2%
SA	8194	25%	4%	4%	3%	20%	4%	15%	1%	3%	4%
SA, exc India	2341	27%	0%	9%	1%	34%	3%	11%	0%	1%	3%
Afghanistan	58	0%	0%	12%	0%	5%	0%	70%	0%	0%	0%
Bangladesh	102	0%	0%	64%	1%	9%	6%	14%	0%	0%	0%
Bhutan	13	15%	0%	0%	0%	7%	29%	46%	0%	1%	0%
India	5854	24%	5%	2%	4%	14%	4%	17%	1%	4%	4%
Maldives	0	0%	0%	0%	0%	0%	79%	0%	2%	0%	1%
Nepal	96	1%	0%	1%	2%	12%	3%	18%	2%	1%	37%
Pakistan	1113	57%	1%	10%	1%	1%	1%	12%	0%	1%	3%
Sri Lanka	1016	0%	0%	3%	0%	75%	4%	8%	0%	1%	1%
Benin	203	0%	2%	71%	0%	0%	3%	10%	0%	4%	7%
Burkina Faso	206	2%	0%	75%	2%	0%	3%	4%	0%	5%	2%
Burundi	29	0%	0%	1%	6%	88%	5%	0%	0%	0%	0%
Cameroon	502	0%	0%	20%	0%	54%	2%	12%	0%	0%	1%
Cape Verde	0	0%	1%	0%	0%	26%	63%	1%	0%	0%	0%
C Afr Rep	20	0%	0%	18%	0%	13%	13%	0%	0%	0%	0%
Chad	116	0%	1%	52%	0%	0%	0%	0%	0%	0%	0%
Comoros	14	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Congo, Dem R	30	3%	0%	0%	2%	37%	13%	2%	0%	0%	3%
Congo, Rep	27	8%	0%	0%	68%	12%	3%	1%	0%	0%	0%
Côte d'Ivoire	2654	0%	0%	6%	1%	74%	1%	9%	0%	0%	2%
Djibouti	9	38%	0%	0%	3%	3%	3%	8%	3%	1%	2%
Equatorial Guinea	6	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Eritrea	2	1%	0%	0%	0%	0%	0%	2%	5%	52%	5%
Ethiopia	342	3%	1%	4%	4%	56%	0%	7%	0%	13%	0%
Gabon	11	1%	1%	0%	16%	2%	60%	1%	1%	0%	2%
Gambia	18	0%	0%	1%	28%	0%	1%	6%	0%	25%	32%
Ghana	786	0%	0%	1%	4%	81%	1%	8%	0%	1%	2%
Guinea	35	2%	0%	7%	8%	25%	1%	3%	0%	2%	1%
Guinea-Bissau	52	0%	0%	4%	0%	0%	0%	95%	0%	1%	0%
Kenya	1044	0%	0%	1%	1%	48%	4%	20%	0%	0%	3%
Liberia	78	0%	0%	0%	0%	3%	0%	0%	0%	0%	1%
Madagascar	164	0%	0%	3%	2%	81%	0%	11%	0%	0%	0%
Mali	299	1%	0%	63%	0%	0%	0%	1%	0%	1%	2%
Mauritania	19	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Niger	65	2%	0%	1%	1%	1%	9%	27%	0%	2%	1%
Nigeria	450	1%	0%	3%	0%	69%	2%	2%	0%	5%	2%
Rwanda	33	0%	0%	0%	0%	91%	1%	0%	0%	0%	0%
Sao Tome and Principe	5	0%	0%	0%	0%	98%	0%	1%	0%	1%	1%
Senegal	156	4%	0%	11%	0%	1%	9%	7%	3%	1%	35%
Sierra Leone	10	0%	0%	1%	0%	70%	10%	6%	0%	0%	1%
Somalia	160	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
Sudan	378	1%	4%	17%	5%	0%	0%	7%	0%	30%	1%
Togo	105	9%	1%	52%	1%	15%	5%	1%	4%	4%	6%
Uganda	225	4%	0%	10%	0%	53%	13%	3%	0%	1%	1%

TF=textile filber; CTC=Coffee, Tea, and Cocoa; BT=Beverages and Tobacco; FV=Fruit and vegetables;

Annex Table 4. Share of Import Bill in Total Ag Imports, by Commodity Group

	Ag(m $)	Cereal	Meat	TF	Sugar	CTC	BT	FV	Milk Eq	Oil seeds	Oils Fats
SSA	11199	31%	4%	1%	8%	2%	10%	6%	7%	1%	12%
SA	8773	8%	0%	13%	5%	5%	2%	17%	3%	3%	35%
SA, exc India	8598	8%	0%	13%	4%	5%	1%	17%	3%	3%	36%
Afghanistan	182	25%	0%	0%	11%	33%	1%	1%	0%	0%	26%
Bangladesh	1662	26%	0%	11%	6%	2%	1%	12%	4%	5%	25%
Bhutan	22	28%	0%	0%	3%	1%	19%	9%	10%	0%	18%
India	4166	0%	0%	15%	1%	3%	1%	23%	0%	0%	48%
Maldives	92	10%	9%	0%	3%	6%	15%	28%	11%	0%	5%
Nepal	247	7%	0%	14%	2%	6%	5%	15%	2%	7%	27%
Pakistan	1773	4%	0%	16%	6%	12%	0%	11%	1%	10%	31%
Sri Lanka	810	22%	0%	1%	16%	5%	7%	14%	14%	0%	8%
Benin	224	23%	21%	0%	3%	1%	16%	9%	7%	0%	7%
Burkina Faso	142	34%	0%	0%	6%	3%	16%	7%	5%	0%	6%
Burundi	28	40%	0%	1%	3%	0%	2%	7%	5%	2%	6%
Cameroon	283	39%	6%	0%	9%	1%	4%	2%	7%	0%	6%
Cape Verde	89	14%	7%	0%	4%	3%	19%	13%	13%	0%	12%
C Afr Rep	25	26%	0%	0%	12%	1%	23%	2%	5%	0%	6%
Chad	58	19%	1%	0%	40%	1%	17%	1%	6%	0%	1%
Comoros	23	31%	24%	0%	8%	1%	11%	6%	7%	0%	5%
Congo, Dem R	266	27%	13%	1%	6%	1%	6%	9%	9%	0%	10%
Congo, Rep	193	17%	12%	0%	3%	1%	11%	9%	10%	0%	11%
Côte d'Ivoire	535	39%	3%	1%	2%	2%	13%	6%	7%	0%	4%
Djibouti	146	17%	1%	0%	7%	1%	27%	8%	12%	0%	12%
Equatorial Guinea	32	11%	18%	0%	3%	0%	50%	0%	4%	0%	10%
Eritrea	89	57%	0%	0%	3%	0%	1%	13%	3%	0%	12%
Ethiopia	366	57%	0%	0%	1%	0%	3%	4%	1%	0%	14%
Gabon	169	18%	21%	0%	0%	1%	15%	7%	10%	0%	7%
Gambia	89	20%	2%	0%	19%	4%	9%	7%	6%	2%	19%
Ghana	616	23%	5%	9%	13%	2%	9%	6%	6%	0%	9%
Guinea	175	32%	1%	0%	10%	1%	19%	6%	5%	0%	10%
Guinea-Bissau	42	53%	3%	1%	5%	1%	18%	2%	3%	0%	9%
Kenya	472	36%	0%	0%	11%	3%	6%	4%	1%	1%	28%
Liberia	89	39%	6%	0%	3%	2%	9%	6%	3%	0%	9%
Madagascar	108	42%	0%	0%	9%	1%	3%	2%	5%	2%	20%
Mali	151	18%	0%	2%	11%	12%	10%	4%	10%	0%	4%
Mauritania	257	22%	2%	0%	15%	6%	15%	6%	9%	1%	13%
Niger	140	30%	0%	0%	8%	4%	14%	5%	7%	0%	20%
Nigeria	1835	33%	0%	1%	12%	1%	6%	3%	11%	0%	12%
Rwanda	59	23%	0%	1%	8%	1%	4%	16%	2%	0%	27%
Sao Tome and Principe	15	27%	5%	0%	4%	1%	30%	6%	5%	0%	8%
Senegal	606	40%	3%	0%	2%	3%	6%	7%	8%	0%	12%
Sierra Leone	143	38%	3%	0%	3%	6%	11%	8%	4%	0%	7%
Somalia	143	49%	0%	0%	30%	2%	1%	2%	1%	0%	11%
Sudan	486	51%	0%	0%	3%	10%	3%	6%	5%	0%	11%
Togo	77	33%	5%	0%	4%	2%	17%	3%	5%	5%	14%
Uganda	171	38%	0%	0%	9%	1%	3%	4%	1%	2%	23%

TF=textile filber; CTC=Coffee, Tea, and Cocoa; BT=Beverages and Tobacco; FV=Fruit and vegetables;

Annex Table 5. Net Exports, by Commodity Group

	Ag(m $)	Cereal	Meat	TF	Sugar	CTC	BT	FV	Milk Eq	Oil seeds	Oils Fats
SSA	-346	-3347	-302	1152	-204	4196	4	259	-695	218	-1121
SA	-579	1351	317	-841	-157	1203	165	-286	-168	-14	-2793
SA, exc India	-2266	-66	-5	-302	-334	487	-45	-312	-215	-255	-1036
Afghanistan	-124	-46	0	7	-21	-56	-2	39	0	0	-48
Bangladesh	-1560	-425	-1	-121	-98	-27	-16	-183	-75	-79	-419
Bhutan	-9	-4	0	0	-1	1	0	4	-2	0	-4
India	1687	1417	321	-539	177	716	209	26	47	241	-1756
Maldives	-92	-9	-9	0	-3	-5	-14	-25	-11	0	-4
Nepal	-152	-16	0	-33	-3	-4	-10	-20	-3	-16	-32
Pakistan	-660	568	7	-171	-101	-198	6	-55	-8	-166	-521
Sri Lanka	206	-179	-2	24	-129	720	-11	-33	-116	6	-56
Benin	-21	-52	-43	143	-7	-2	-29	1	-16	8	-1
Burkina Faso	64	-44	0	154	-5	-4	-17	-2	-7	10	-4
Burundi	1	-11	0	0	1	25	1	-2	-1	-1	-2
Cameroon	219	-111	-16	103	-24	271	-1	55	-19	0	-11
Cape Verde	-89	-13	-6	0	-4	-2	-17	-11	-12	0	-10
C Afr Rep	-5	-7	0	4	-3	2	-3	0	-1	0	-1
Chad	58	-11	0	60	-23	-1	-10	0	-3	0	0
Comoros	-9	-7	-5	0	-2	14	-2	-1	-2	0	-1
Congo, Dem R	-236	-71	-36	-3	-15	8	-13	-22	-23	0	-26
Congo, Rep	-166	-32	-24	0	13	1	-21	-18	-18	0	-20
Côte d'Ivoire	2119	-204	-14	143	8	1960	-55	195	-28	8	22
Djibouti	-137	-22	-2	0	-9	-2	-39	-11	-17	-1	-17
Equatorial Guinea	-26	-3	-6	0	-1	6	-16	0	-1	0	-3
Eritrea	-87	-51	0	0	-2	0	-1	-12	-2	1	-11
Ethiopia	-25	-199	3	11	8	189	-9	7	-4	44	-50
Gabon	-158	-30	-35	0	2	-2	-19	-11	-17	0	-12
Gambia	-71	-18	-2	0	-12	-4	-8	-5	-5	3	-11
Ghana	170	-139	-28	-48	-46	622	-47	25	-33	9	-39
Guinea	-140	-55	-2	2	-15	7	-32	-9	-8	1	-17
Guinea-Bissau	10	-22	-1	2	-2	0	-7	49	-1	0	-4
Kenya	572	-165	2	10	-44	486	13	194	-3	-3	-103
Liberia	-10	-34	-5	0	-2	1	-8	-5	-3	0	-7
Madagascar	56	-45	0	4	-8	132	-3	16	-5	-1	-22
Mali	147	-25	0	185	-17	-18	-14	-4	-15	3	0
Mauritania	-239	-56	-5	0	-38	-15	-39	-16	-22	-1	-33
Niger	-75	-41	0	0	-11	-5	-14	11	-10	1	-27
Nigeria	-1386	-607	-5	3	-222	289	-105	-52	-202	15	-206
Rwanda	-26	-13	0	0	-5	30	-2	-9	-1	0	-16
Sao Tome and Principe	-10	-4	-1	0	-1	4	-5	-1	-1	0	-1
Senegal	-450	-233	-15	17	-13	-17	-24	-29	-42	1	-18
Sierra Leone	-133	-54	-5	0	-5	-2	-15	-10	-5	0	-10
Somalia	17	-71	0	0	-43	-3	-2	4	-1	0	-16
Sudan	-108	-242	16	66	5	-49	-13	-3	-23	114	-45
Togo	28	-17	-3	55	-2	14	-8	-2	1	0	-4
Uganda	54	-57	0	22	-15	118	26	0	-2	-2	-36

TF=textile filber; CTC=Coffee, Tea, and Cocoa; BT=Beverages and Tobacco; FV=Fruit and vegetables;

Annex Table 6. Impact on World Export Price Index, by Commodity

	Agri Trade Reform Along				Both Agri and Ind. Reforms			
Px-I	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
Osd	9.79	6.12	6.15	6.14	9.57	5.88	6.01	6.01
Mil	3.23	3.56	3.46	3.46	1.36	2.48	2.50	2.50
Gro	3.79	2.99	2.86	2.85	2.80	2.39	2.36	2.35
Pfb	3.23	2.22	2.55	3.80	1.81	1.50	2.11	3.38
Pdr	2.01	2.24	1.88	1.89	5.52	4.22	3.89	3.90
Rmk	-0.24	0.96	1.65	1.66	0.04	1.09	1.95	1.96
Pcr	-1.31	0.35	1.12	1.13	-0.06	1.03	2.01	2.02
Wht	0.88	0.99	1.12	1.12	0.08	0.52	0.84	0.84
Ocr	0.16	0.38	0.89	0.89	-0.37	0.02	0.60	0.61
Sgr	-1.07	0.39	0.70	0.70	-1.45	0.09	0.64	0.64
Cmt	-0.09	0.53	0.58	0.59	-1.07	-0.08	0.18	0.18
Wol	-0.95	-0.10	0.51	0.52	-0.48	0.12	1.04	1.05
Vol	-1.61	-0.05	0.44	0.45	-2.62	-0.69	-0.01	0.00
v_f	-0.84	-0.09	0.26	0.26	-1.11	-0.36	0.10	0.11
c_b	-0.49	-0.07	0.22	0.23	-0.55	-0.08	0.45	0.46
Omt	-0.43	0.22	0.19	0.20	-1.91	-0.62	-0.58	-0.58
Ctl	-2.18	-0.72	-0.22	-0.21	-2.98	-1.25	-0.60	-0.59
Ofd	-1.67	-0.38	-0.23	-0.23	-2.74	-1.01	-0.74	-0.73
Oap	-1.77	-0.64	-0.44	-0.43	-2.18	-0.95	-0.68	-0.68
b_t	-10.32	-5.44	-5.48	-5.48	-12.24	-6.56	-6.56	-6.55
Mnfcs	-0.05	-0.03	-0.01	-0.01	-3.80	-1.95	-1.78	-1.78
Svces	-0.11	-0.06	-0.05	-0.05	-1.55	-0.83	-0.73	-0.73

Annex Table 7. Impact on World Price Index (supplies), by Commodity (%)

	Agri Trade Reform Along				Both Agri. and Ind. Reforms			
Pw	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
Osd	5.63	3.72	3.94	3.94	6.57	4.20	4.51	4.51
Gro	1.70	1.65	2.04	2.05	1.63	1.56	2.10	2.11
Mil	1.80	2.13	2.00	2.01	0.20	1.30	1.26	1.26
Pfb	1.40	1.11	1.41	1.99	1.81	1.41	1.98	2.55
Wht	1.37	0.98	1.39	1.39	1.93	1.28	1.90	1.90
Pdr	-0.67	0.52	1.28	1.30	2.53	2.17	3.07	3.09
Rmk	-0.05	0.71	1.01	1.01	-0.25	0.60	1.03	1.03
Vol	-0.64	0.32	0.61	0.61	-1.76	-0.30	0.11	0.11
Ocr	-0.19	0.22	0.55	0.56	-0.45	0.06	0.47	0.48
c_b	-0.34	0.13	0.46	0.47	0.05	0.36	0.85	0.86
v_f	-0.70	0.03	0.41	0.42	2.39	1.50	1.96	1.96
Wol	-1.48	-0.34	0.21	0.22	0.24	0.53	1.25	1.26
Ctl	-1.27	-0.27	0.08	0.09	-1.37	-0.40	0.09	0.10
Pcr	-1.79	-0.29	0.01	0.02	1.41	1.47	1.91	1.92
Omt	-1.00	-0.10	0.00	0.01	-1.88	-0.61	-0.41	-0.41
Cmt	-0.37	0.11	-0.04	-0.04	-1.55	-0.53	-0.55	-0.55
Oap	-1.83	-0.56	-0.24	-0.24	0.79	0.63	0.99	1.00
Sgr	-1.90	-0.25	-0.64	-0.64	-2.67	-0.62	-0.82	-0.82
Ofd	-2.32	-0.90	-0.93	-0.93	-2.90	-1.18	-1.15	-1.15
b_t	-14.53	-7.92	-7.69	-7.69	-15.20	-8.20	-7.91	-7.91
Mnfcs	-0.02	-0.01	0.00	0.00	-3.75	-1.90	-1.78	-1.78
Svces	-0.09	-0.04	-0.06	-0.06	-1.25	-0.58	-0.57	-0.57

Annex Table 8. Change in Export Price of Commodity I in Region r, Agri Shocks

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	Other Sub-Saharan Africa				**Other South Asia**			
Pdr	-0.79	-0.09	0.68	0.73	-2.86	-0.37	1.59	1.64
Wht	6.00	2.71	0.76	0.80	5.60	2.51	0.90	0.94
Gro	-0.31	0.05	0.57	0.62	-0.86	-0.01	1.00	1.05
V_f	-0.79	-0.08	1.01	1.06	-2.77	-0.76	1.11	1.16
Osd	1.15	0.59	2.53	2.57	-0.80	-0.10	1.75	1.80
C_b	-1.70	-0.52	0.49	0.53	-4.03	-1.40	0.11	0.16
Pfb	-1.54	-0.36	0.93	1.17	-0.52	0.19	1.18	1.44
Ocr	-1.45	-0.42	0.46	0.50	-2.97	-0.84	1.10	1.15
Ctl	-2.60	-0.86	0.46	0.50	-3.85	-1.19	0.98	1.02
Oap	-2.90	-0.92	0.58	0.61	-3.95	-1.25	1.08	1.14
Rmk	-1.35	-0.32	0.64	0.69	-3.88	-1.21	1.09	1.14
Wol	-3.07	-1.01	0.60	0.64	-2.97	-0.91	0.90	0.94
Cmt	-2.29	-0.78	0.30	0.33	-2.83	-0.93	0.59	0.62
Omt	-1.76	-0.54	0.35	0.38	-2.88	-0.93	0.69	0.72
Vol	-0.95	-0.23	0.70	0.73	-3.65	-1.11	1.06	1.08
Mil	0.89	2.03	2.76	2.77	-4.62	-1.64	0.59	0.62
Pcr	-0.96	-0.16	0.64	0.69	2.10	1.09	0.54	0.55
Sgr	-2.34	-0.82	0.23	0.26	-5.81	-2.21	0.11	0.13
Ofd	-0.90	-0.18	0.32	0.34	-2.26	-0.74	0.37	0.38
B_t	-3.67	-1.35	0.23	0.25	-11.16	-4.54	0.16	0.16
Mnfcs	-0.45	-0.14	0.06	0.07	-0.68	-0.23	0.09	0.10
Svces	-0.68	-0.21	0.09	0.11	-0.79	-0.30	0.03	0.02

Annex Table 8. Change in Export Price of Commodity I in Region r, Agri Shocks (cont)

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	Uganda				**Madagascar**			
Pdr	-2.10	-0.75	-0.11	-0.02	-2.18	-0.86	-0.56	-0.52
Wht	-1.99	-0.70	-0.07	0.02	3.93	4.05	3.80	3.80
Gro	-2.07	-0.75	-0.12	-0.02	-2.23	-0.90	-0.59	-0.56
V_f	-2.08	-0.77	-0.14	-0.05	-2.50	-1.08	-0.88	-0.84
osd	-1.84	-0.59	0.09	0.18	-2.07	-0.79	-0.45	-0.41
C_b	-2.24	-0.85	-0.29	-0.22	-2.23	-0.91	-0.61	-0.57
pfb	-0.83	-0.08	0.50	1.07	-1.12	-0.27	0.05	0.46
ocr	-2.23	-0.84	-0.11	-0.05	-2.77	-1.07	-0.58	-0.55
ctl	-2.17	-0.80	-0.15	-0.05	-2.04	-0.81	-0.47	-0.44
oap	-2.42	-0.88	-0.12	-0.03	-2.03	-0.81	-0.48	-0.45
rmk	-2.14	-0.79	-0.13	-0.03	-2.04	-0.82	-0.48	-0.45
wol	-5.04	-1.84	0.29	0.34	-0.80	0.08	0.53	0.54
cmt	-1.97	-0.76	-0.15	-0.08	-2.20	-0.90	-0.39	-0.37
omt	-2.18	-0.82	-0.14	-0.07	-1.71	-0.70	-0.40	-0.38
vol	-2.01	-0.70	0.02	0.08	-2.21	-0.89	-0.38	-0.36
mil	-1.34	0.10	0.84	0.90	-2.31	-0.95	-0.40	-0.38
pcr	-7.10	-2.61	0.38	0.42	-2.14	-0.84	-0.54	-0.50
sgr	-2.15	-0.81	-0.21	-0.14	-2.21	-0.90	-0.38	-0.36
ofd	-3.14	-1.08	0.00	0.06	-2.18	-0.87	-0.35	-0.33
B_t	-23.08	-9.84	-0.15	-0.08	-2.22	-0.90	-0.39	-0.37
Mnfcs	-1.17	-0.45	-0.11	-0.07	-0.75	-0.34	-0.26	-0.25
Svces	-1.33	-0.52	-0.14	-0.09	-0.95	-0.42	-0.32	-0.31

Annex Table 8. Change in Export Price of Commodity I in Region r, Agri Shocks (cont)

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	India				**Bangladesh**			
Pdr	1.47	1.11	0.77	0.78	-0.74	-0.16	0.26	0.38
Wht	7.17	3.02	2.97	2.97	0.08	0.26	0.56	0.61
Gro	-0.48	0.10	0.02	0.03	-0.56	-0.06	0.39	0.49
V_f	-1.59	-0.30	-0.36	-0.35	-2.39	-0.81	0.22	0.33
osd	-2.10	-0.46	-0.53	-0.52	-5.15	-1.76	0.48	0.55
C_b	-1.30	-0.19	-0.42	-0.41	-2.03	-0.63	0.18	0.28
pfb	0.20	0.39	0.32	0.41	-8.71	-3.39	0.62	0.95
ocr	-0.98	-0.06	-0.13	-0.12	-0.25	0.10	0.30	0.42
ctl	-1.69	-0.40	-0.45	-0.44	-2.79	-0.94	0.25	0.34
oap	-3.86	-1.23	-1.33	-1.32	-0.87	-0.17	0.35	0.45
rmk	-3.84	-1.21	-1.31	-1.30	-2.78	-0.94	0.25	0.34
wol	-3.81	-1.24	-1.13	-1.12	-0.16	-0.05	0.15	0.15
cmt	-2.71	-1.02	-1.01	-1.01	-5.47	-2.10	0.05	0.06
omt	-28.08	-10.67	-9.78	-9.79	-7.93	-2.94	0.08	0.09
vol	-3.62	-1.13	-1.13	-1.13	-1.35	0.07	0.95	0.98
mil	-4.07	-1.45	-1.48	-1.48	-7.72	-3.00	0.07	0.08
pcr	5.88	2.46	2.38	2.38	-0.52	-0.14	0.09	0.16
sgr	-4.77	-1.72	-1.85	-1.84	-1.64	-0.59	0.01	0.05
ofd	-2.34	-0.77	-0.79	-0.79	-1.65	-0.52	0.32	0.33
B_t	-7.69	-3.06	-3.04	-3.04	-62.96	-31.02	-0.05	-0.04
Mnfcs	-0.64	-0.21	-0.22	-0.21	-0.32	-0.13	-0.06	-0.04
Svces	-0.71	-0.24	-0.26	-0.26	0.06	-0.02	-0.19	-0.20

Annex Table 9. Impact on Import Price Index for Grains, by Commodity (%)

	Agri Trade Reform Along				Both Agri. And Ind. Reforms			
Pw	Sce1a	Sce2a	Sce3a	Sce4a	Sce1b	Sce2b	Sce3b	Sce4b
India								
Cereal Average	2.1	1.6	2.4	2.3	1.4	1.4	2.3	2.3
Rice	4.6	2.9	4.1	4.1	1.8	2.1	2.9	2.9
Wheat	0.2	0.6	1.5	1.5	0.1	0.6	2.0	2.0
Other Cereals	1.5	1.1	1.5	1.5	2.2	1.5	2.0	2.0
Bangladesh								
Cereal Average	2.4	1.4	1.7	1.7	3.1	1.9	2.3	2.3
Rice	2.2	1.2	1.6	1.6	4.3	2.8	3.6	3.6
Wheat	3.4	2.1	2.4	2.4	3.4	2.1	2.4	2.4
Other Cereals	1.5	0.9	1.0	1.0	1.5	0.9	1.0	1.0
Other South Asia								
Cereal Average	2.8	2.4	2.2	2.2	2.8	2.4	2.5	2.5
Rice	2.2	1.2	0.8	0.8	5.9	4.1	4.3	4.3
Wheat	2.4	2.4	2.3	2.2	1.3	1.4	0.9	0.9
Other Cereals	3.8	3.6	3.7	3.7	1.1	1.5	2.3	2.3
Madagascar								
Cereal Average	7.0	6.9	6.4	6.4	6.9	7.0	6.7	6.7
Rice	2.8	3.0	2.5	2.5	7.5	6.3	6.2	6.2
Wheat	7.0	6.8	6.4	6.3	4.4	5.4	4.9	4.9
Other Cereals	11.1	10.9	10.3	10.3	8.7	9.5	8.9	8.9
Uganda								
Cereal Average	4.4	5.2	5.7	5.7	3.9	4.9	5.6	5.6
Rice	-0.8	1.7	2.9	2.9	0.3	2.4	3.9	3.9
Wheat	0.6	1.1	1.8	1.8	0.3	0.9	1.9	1.9
Other Cereals	13.5	12.9	12.4	12.4	11.2	11.6	11.1	11.1
Other SSA								
Cereal Average	1.9	1.5	1.2	1.2	2.8	2.4	2.5	2.5
Rice	2.2	1.2	0.8	0.8	5.9	4.1	4.3	4.3
Wheat	1.9	1.5	0.7	0.7	1.3	1.4	0.9	0.9
Other Cereals	1.5	1.7	2.3	2.3	1.1	1.5	2.3	2.3

Annex Table 10. Change in export price of commodity I in region r

PM	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	Other Sub-Saharan Africa				**Other South Asia**			
Pdr	-1.89	-0.87	-0.70	-0.65	0.27	2.17	4.76	4.81
Wht	3.73	1.50	-0.59	-0.56	9.16	5.44	4.52	4.56
Gro	-3.46	-1.57	-0.99	-0.94	3.58	3.4	4.97	5.03
V_f	-2.09	-0.96	-0.45	-0.40	1.23	2.36	4.81	4.86
Osd	0.46	-0.05	1.21	1.25	3.14	2.94	5.29	5.34
C_b	-5.58	-2.43	-1.13	-1.09	0.2	1.73	3.76	3.81
Pfb	-4.69	-1.95	-0.41	-0.17	3.06	3.14	4.85	5.11
Ocr	-3.71	-1.67	-0.98	-0.94	0.49	1.87	4.30	4.35
Ctl	-5.26	-2.31	-1.19	-1.15	-0.26	1.74	4.55	4.59
Oap	-4.86	-2.08	-1.01	-0.97	0.63	2.19	4.99	5.05
Rmk	-3.01	-1.36	-0.96	-0.91	0.69	2.29	5.13	5.18
Wol	-4.81	-2.07	-0.91	-0.86	1.21	2.34	4.70	4.74
Cmt	-5.24	-2.36	-1.49	-1.46	1.91	2.78	4.88	4.90
Omt	-4.17	-1.91	-1.43	-1.40	2.26	2.94	5.02	5.05
Vol	-4.20	-1.91	-0.98	-0.96	-0.38	1.67	4.54	4.56
Mil	-3.01	0.09	1.06	1.08	-0.72	1.66	4.67	4.69
Pcr	-2.30	-1.04	-0.78	-0.73	6.22	4.48	4.60	4.61
Sgr	-5.95	-2.68	-1.63	-1.60	-1.98	0.97	4.06	4.08
Ofd	-4.57	-2.06	-1.50	-1.48	2.21	2.87	4.60	4.61
B_t	-6.88	-3.06	-1.63	-1.61	-7.42	-1.13	4.53	4.54
Mnfcs	-8.69	-3.88	-2.01	-2.00	-1.8	1	3.80	3.81
Svces	-4.84	-2.31	-1.91	-1.90	3.48	3.37	4.49	4.48

Annex Table 10. Change in export price of commodity I in region r

	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	Uganda				**Madagascar**			
Pdr	-4.95	-2.27	-1.43	-1.33	-2.53	-0.76	0.71	0.75
Wht	-4.89	-2.25	-1.39	-1.30	1.83	2.92	2.85	2.85
Gro	-4.93	-2.28	-1.44	-1.35	-2.74	-0.89	0.53	0.56
V_f	-4.98	-2.31	-1.47	-1.37	-2.97	-1.07	0.24	0.27
osd	-4.59	-2.07	-1.19	-1.10	-2.50	-0.76	0.67	0.70
C_b	-5.85	-2.69	-1.70	-1.63	-2.77	-0.92	0.50	0.54
pfb	-3.67	-1.55	-0.63	-0.05	-1.71	-0.35	0.97	1.37
ocr	-4.63	-2.14	-1.24	-1.17	-3.12	-1.04	0.41	0.44
ctl	-5.14	-2.38	-1.49	-1.39	-2.81	-0.89	0.70	0.73
oap	-5.11	-2.32	-1.35	-1.26	-2.80	-0.89	0.69	0.72
rmk	-5.08	-2.35	-1.46	-1.37	-2.80	-0.89	0.71	0.73
wol	-6.89	-2.82	-0.41	-0.35	-3.39	-1.09	0.02	0.03
cmt	-5.96	-2.78	-1.70	-1.63	-3.08	-0.98	0.88	0.90
omt	-5.80	-2.69	-1.64	-1.57	-2.29	-0.63	1.03	1.05
vol	-5.83	-2.64	-1.46	-1.39	-3.07	-0.97	0.89	0.92
mil	-5.52	-2.00	-0.71	-0.65	-3.13	-1.00	0.91	0.93
pcr	-9.95	-4.10	-0.77	-0.73	-2.52	-0.75	0.72	0.76
sgr	-5.77	-2.67	-1.66	-1.58	-3.08	-0.98	0.89	0.91
ofd	-6.42	-2.76	-1.30	-1.24	-3.06	-0.96	0.90	0.92
B_t	-26.52	-11.73	-1.70	-1.63	-3.09	-0.99	0.88	0.90
Mnfcs	-7.45	-3.42	-1.85	-1.80	-2.79	-0.89	0.87	0.87
Svces	-5.63	-2.66	-1.72	-1.68	-2.36	-0.72	0.88	0.89

Annex Table 10. Change in export price of commodity I in region r

	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	India				**Bangladesh**			
Pdr	3.56	2.28	1.94	1.93	-1.68	-0.44	2.02	2.14
Wht	7.91	3.64	3.67	3.67	-1.56	-0.33	1.62	1.67
Gro	1.08	1.09	1.02	1.01	-1.48	-0.28	2.07	2.18
V_f	-0.07	0.64	0.61	0.60	-2.32	-0.70	2.04	2.15
osd	-0.66	0.45	0.41	0.40	-6.28	-2.16	1.83	1.89
C_b	0.44	0.88	0.65	0.64	-2.00	-0.54	2.00	2.11
pfb	1.31	1.18	1.31	1.22	-9.54	-3.66	2.13	2.46
ocr	0.36	0.78	0.73	0.72	-0.31	0.17	2.03	2.14
ctl	-0.42	0.44	0.43	0.43	-3.42	-1.12	1.92	2.01
oap	-1.71	0.02	-0.13	-0.14	-1.45	-0.30	2.09	2.18
rmk	-1.79	0.01	-0.15	-0.16	-3.41	-1.12	1.92	2.01
wol	-2.10	-0.21	-0.08	-0.08	-1.75	-0.85	-0.32	-0.31
cmt	-2.46	-0.56	-0.43	-0.43	-6.70	-2.70	0.07	0.08
omt	-26.50	-9.38	-8.23	-8.21	-8.92	-3.46	0.20	0.21
vol	-2.84	-0.48	-0.39	-0.40	-2.25	-0.32	2.01	2.04
mil	-3.09	-0.68	-0.67	-0.67	-10.48	-4.10	1.29	1.30
pcr	7.02	3.28	3.27	3.28	-1.74	-0.56	1.82	1.89
sgr	-3.44	-0.82	-0.90	-0.91	-5.55	-2.11	1.29	1.33
ofd	-1.24	0.02	0.08	0.07	-3.84	-1.36	1.56	1.57
B_t	-7.57	-2.65	-2.51	-2.51	-64.09	-31.59	1.53	1.54
Mnfcs	-7.23	-2.57	-2.12	-2.12	-5.27	-2.06	1.17	1.18
Svces	0.17	0.48	0.55	0.56	-1.33	-0.57	1.50	1.48

Annex Table 11. Output Changes (%), Agricultural Liberalization

qo	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	Other Sub-Saharan Africa				**Other South Asia**			
Pdr	-3.88	-1.13	0.04	0.01	-4.69	-0.35	1.99	1.97
wht	-17.99	-4.74	2.42	2.31	-4.72	-1.69	0.01	-0.01
gro	-1.55	-0.51	-0.06	-0.07	0.10	0.01	-0.08	-0.08
V_f	4.07	2.23	3.75	3.72	-0.35	-0.16	0.17	0.16
osd	53.38	20.09	21.72	21.62	0.45	-0.23	2.27	2.25
C_b	-3.23	-0.98	-0.11	-0.11	-5.85	-2.70	-2.78	-2.80
pfb	19.89	9.59	6.55	9.56	1.85	0.91	0.51	1.17
ocr	-2.93	-1.28	-1.47	-1.54	-5.90	-2.31	0.17	0.15
ctl	-1.00	-0.25	0.02	0.02	-1.68	-0.38	0.66	0.69
oap	-3.63	-1.11	0.06	0.05	0.95	0.25	-0.16	-0.17
rmk	0.67	0.87	0.87	0.87	1.08	0.38	-0.05	-0.06
wol	-1.63	-0.33	0.20	0.19	1.13	0.35	-0.43	-0.46
cmt	0.46	1.53	1.58	1.57	-3.54	-0.99	-0.22	-0.24
omt	-10.54	-2.51	2.17	2.15	3.77	1.10	1.21	1.18
vol	-2.16	-0.62	-0.94	-0.97	-49.92	-19.34	-1.32	-1.36
mil	35.52	36.18	36.21	36.17	1.27	1.20	1.16	1.15
pcr	-3.53	-1.05	0.02	-0.01	-1.69	-0.32	0.85	0.85
sgr	-1.80	0.23	0.83	0.83	-13.60	-6.22	-6.27	-6.29
ofd	-10.42	-3.89	-0.88	-0.89	0.26	0.11	0.28	0.28
B_t	-4.27	-1.72	-0.53	-0.53	-1.49	-0.54	-0.36	-0.37
Mnfcs	1.32	0.31	-0.43	-0.47	1.97	0.65	-0.32	-0.35
Svces	-0.16	-0.11	-0.15	-0.15	0.28	0.08	-0.10	-0.10

Annex Table 11. Output Changes (%), Agricultural Liberalization (Con't)

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	Uganda				**Madagascar**			
pdr	-0.23	0.12	0.19	0.18	0.31	0.26	0.19	0.19
wht	0.74	0.55	0.59	0.55	10.83	10.03	9.05	9.02
Gro	0.05	0.14	0.15	0.15	-0.36	-0.18	-0.31	-0.33
V_f	-0.12	-0.07	-0.10	-0.10	-3.58	-2.28	-3.55	-3.57
osd	2.45	1.80	2.23	2.19	1.70	1.16	1.48	1.46
C_b	-6.04	-2.54	-2.33	-2.42	-0.54	-0.39	-0.54	-0.54
pfb	13.57	7.58	7.15	12.78	13.19	7.27	7.33	11.71
ocr	-1.87	-0.85	0.21	-0.09	-5.61	-1.73	0.03	-0.03
ctl	-0.58	-0.28	-0.21	-0.20	-0.45	-0.27	-0.29	-0.29
oap	-2.83	-0.93	0.06	0.01	-0.68	-0.33	-0.31	-0.31
rmk	-0.32	-0.11	-0.02	-0.01	-0.44	-0.26	-0.28	-0.28
wol	17.23	8.59	4.74	4.47	-4.31	-2.59	-1.69	-1.58
cmt	-0.76	-0.27	-0.19	-0.18	-0.43	-0.20	-0.21	-0.22
omt	-24.35	-8.03	3.48	3.31	-14.07	-4.45	2.42	2.38
vol	-19.13	-6.31	2.25	2.00	-8.00	-2.31	1.58	1.56
mil	1.96	5.83	7.92	7.90	0.18	3.34	5.10	5.07
pcr	-5.71	-1.22	1.04	1.01	0.31	0.26	0.19	0.19
sgr	-3.96	-0.36	1.54	1.52	-0.19	-0.06	0.16	0.15
ofd	-7.76	-4.11	-4.96	-5.09	-2.98	-2.29	-3.62	-3.66
B_t	2.25	0.89	-0.26	-0.25	-0.40	-0.25	-0.29	-0.29
Mnfcs	3.18	1.17	0.18	0.05	1.94	0.82	0.60	0.57
Svces	-0.15	-0.10	-0.07	-0.07	0.20	0.06	0.03	0.02

Annex Table 11. Output Changes (%), Agricultural Liberalization (Con't)

	Sce1a	Sce2a	Sce3a	Sce4a	Sce1a	Sce2a	Sce3a	Sce4a
	India				**Bangladesh**			
Pdr	-0.21	0.46	-0.23	-0.23	0.06	0.02	-0.01	-0.01
Wht	-1.91	-0.69	-0.64	-0.64	-7.60	-2.15	2.55	2.42
Gro	-0.09	-0.04	-0.02	-0.02	0.11	0.10	0.38	0.28
V_f	-3.54	-1.29	-1.17	-1.18	-2.71	-1.01	-0.07	-0.11
Osd	-5.49	-1.90	-1.82	-1.83	-26.33	-9.19	1.95	1.87
C_b	1.36	0.59	0.16	0.16	-6.93	-2.44	-0.09	-0.11
Pfb	-0.38	-0.11	-0.05	0.22	14.18	6.15	2.33	3.53
Ocr	-1.37	-0.44	-0.38	-0.39	-3.55	-1.21	0.16	0.11
Ctl	-2.07	-0.58	-0.65	-0.64	0.08	0.06	0.08	0.10
Oap	1.08	0.37	0.34	0.34	-0.28	-0.18	-0.24	-0.26
Rmk	1.39	0.51	0.48	0.48	0.10	0.07	0.08	0.10
Wol	-7.80	-3.00	-1.77	-1.78	35.56	16.35	28.68	28.68
Cmt	6.27	6.68	7.30	7.29	-26.06	-9.41	19.13	19.12
Omt	352.66	99.84	79.29	79.35	31.20	6.17	-10.44	-10.46
Vol	-53.71	-20.19	-18.82	-18.83	-30.78	-12.45	-1.64	-1.68
Mil	1.99	1.02	0.88	0.88	-26.19	-7.34	3.75	3.74
Pcr	-1.23	-0.35	-0.33	-0.33	0.06	0.01	-0.02	-0.03
Sgr	3.06	1.36	0.35	0.34	-7.76	-2.73	-0.09	-0.11
Ofd	2.14	0.83	0.00	0.00	-4.12	-1.87	-1.48	-1.49
B_t	0.36	0.12	0.14	0.14	13.20	5.48	-0.27	-0.28
Mnfcs	1.45	0.46	0.52	0.51	0.86	0.33	0.10	0.05
Svces	0.31	0.10	0.10	0.10	0.06	0.00	-0.05	-0.05

Annex Table 12. Output Changes (%), Agriculture and Manufacturing Liberalization

qo	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	Other Sub-Saharan Africa				**Other South Asia**			
Pdr	-2.38	-0.12	1.74	1.71	-5.08	-1.11	0.86	0.84
wht	-14.16	-2.65	5.42	5.31	-5.46	-2.27	-0.61	-0.62
gro	-1.89	-0.63	-0.10	-0.11	0.39	0.26	0.27	0.26
V_f	3.89	2.23	4.31	4.27	-0.56	-0.33	0.05	0.03
osd	55.13	21.00	24.14	24.05	-0.93	-1.19	1.25	1.23
C_b	-2.98	-0.86	-0.06	-0.06	-6.64	-3.5	-3.43	-3.45
pfb	27.24	13.13	10.52	13.62	-0.68	-0.33	-0.15	0.49
ocr	-0.25	0.11	0.47	0.40	-8.78	-4.29	-1.88	-1.91
ctl	-2.36	-0.78	-0.31	-0.30	-2.25	-0.85	0.20	0.22
oap	-3.43	-1.05	-0.19	-0.20	1.12	0.42	0.12	0.11
rmk	-1.00	0.21	0.46	0.46	1.92	1.04	0.76	0.74
wol	-2.37	-0.55	0.39	0.38	0.39	-0.21	-0.86	-0.89
cmt	-0.06	1.49	2.01	2.00	-5.28	-2.45	-1.48	-1.50
omt	-12.38	-3.23	2.08	2.07	-1.49	-2.22	-1.82	-1.85
vol	-0.91	-0.04	-0.19	-0.21	-53.51	-22.92	-5.38	-5.42
mil	38.31	37.36	37.11	37.07	1.7	1.57	1.72	1.71
pcr	-1.98	-0.01	1.74	1.71	-2.61	-1.31	-0.28	-0.28
sgr	-1.77	0.31	0.99	0.98	-15.89	-8.43	-8.26	-8.29
ofd	-9.64	-3.51	-0.43	-0.44	-1.93	-1.46	-1.32	-1.33
B_t	-5.14	-2.07	-0.75	-0.75	-1.16	-0.33	-0.08	-0.08
Mnfcs	-2.02	-1.12	-1.00	-1.04	2.53	1.78	1.68	1.66
Svces	1.60	0.57	-0.24	-0.25	0.51	0.01	-0.49	-0.49
CGDS	11.14	3.65	-2.95	-2.95	8.23	4.09	1.20	1.18
cereal								

Annex Table 12. Output Changes (%), Agriculture and Manufacturing Liberalization (con't)

	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	Uganda				**Madagascar**			
pdr	-0.06	0.22	0.29	0.27	0.81	0.59	0.64	0.64
wht	0.87	0.63	0.69	0.65	9.62	8.91	6.97	6.94
Gro	0.03	0.12	0.12	0.11	-0.60	-0.48	-0.95	-0.96
V_f	-0.28	-0.14	-0.12	-0.12	-3.98	-2.79	-4.60	-4.62
osd	3.54	2.30	2.69	2.65	1.52	0.77	0.40	0.38
C_b	-4.56	-1.99	-2.32	-2.41	-0.73	-0.65	-1.11	-1.11
pfb	18.06	9.99	9.92	15.68	12.02	6.07	4.30	8.63
ocr	5.11	2.42	2.53	2.22	-5.81	-2.47	-2.52	-2.58
ctl	-1.27	-0.59	-0.31	-0.30	-0.23	-0.16	0.13	0.14
oap	-1.04	0.02	1.05	1.00	-0.30	-0.20	-0.10	-0.10
rmk	-0.98	-0.40	-0.09	-0.08	-0.22	-0.14	0.14	0.14
wol	45.79	22.95	18.70	18.40	5.54	1.85	0.87	0.98
cmt	-1.15	-0.45	-0.23	-0.22	-0.12	-0.07	0.13	0.13
omt	-18.28	-5.03	5.53	5.36	-11.50	-4.44	-0.57	-0.60
vol	-9.51	-1.40	6.23	5.98	-7.71	-2.89	-0.63	-0.65
mil	2.48	6.00	7.85	7.83	0.15	2.72	2.87	2.83
pcr	-2.10	0.65	2.70	2.67	0.81	0.58	0.64	0.64
sgr	-2.58	0.28	2.06	2.03	-0.16	-0.11	0.15	0.15
ofd	-6.01	-3.53	-5.25	-5.38	-4.73	-4.22	-8.34	-8.38
B_t	1.97	0.76	-0.31	-0.30	-0.30	-0.23	-0.13	-0.13
Mnfcs	-3.15	-1.52	-0.95	-1.08	1.96	1.18	1.64	1.61
Svces	0.23	0.02	-0.18	-0.18	0.23	0.03	0.02	0.02

Annex Table 12. Output Changes (%), Agriculture and Manufacturing Liberalization (Con't)

	Sce1b	Sce2b	Sce3b	Sce4b	Sce1b	Sce2b	Sce3b	Sce4b
	India				**Bangladesh**			
Pdr	-0.37	0.38	-0.29	-0.28	0.47	0.22	0.31	0.31
Wht	-2.17	-0.89	-0.83	-0.83	-2.80	-0.34	-0.56	-0.68
Gro	-0.13	-0.02	-0.04	-0.04	3.47	1.60	0.76	0.66
V_f	-3.88	-1.48	-1.34	-1.34	-2.28	-0.82	-0.12	-0.15
Osd	-5.85	-2.12	-2.03	-2.03	-23.97	-8.41	0.03	-0.05
C_b	1.21	0.56	0.13	0.13	-4.68	-1.54	0.11	0.09
Pfb	-1.84	-0.70	-0.05	-0.31	11.69	5.27	1.01	2.20
Ocr	-2.39	-1.03	-0.94	-0.93	-2.90	-0.91	-0.11	-0.16
Ctl	-2.48	-0.82	-0.85	-0.85	0.40	0.25	0.48	0.50
Oap	1.25	0.52	0.39	0.40	0.61	0.23	0.49	0.47
Rmk	1.30	0.61	0.47	0.48	0.43	0.26	0.48	0.49
Wol	-6.94	-2.67	-1.43	-1.41	94.61	43.85	54.20	54.20
Cmt	4.56	4.56	5.73	5.74	-19.38	-5.92	21.98	21.96
Omt	306.95	80.40	59.58	59.53	25.16	2.44	-17.01	-17.03
Vol	-54.83	-21.17	-19.59	-19.58	-28.81	-11.65	-2.62	-2.65
Mil	2.00	1.13	0.90	0.90	-20.99	-5.28	2.89	2.88
Pcr	-1.27	-0.38	-0.37	-0.37	0.47	0.22	0.29	0.28
Sgr	2.72	1.25	0.28	0.28	-5.28	-1.75	0.09	0.07
Ofd	0.73	0.00	-0.78	-0.78	-2.84	-1.53	-2.80	-2.80
B_t	0.45	0.21	0.15	0.15	13.96	5.80	0.17	0.16
Mnfcs	0.75	0.36	0.71	0.71	-1.86	-0.59	0.32	0.27
Svces	0.71	0.22	0.12	0.12	0.58	0.16	-0.10	-0.10