The Potential Payoffs of implementing the Hong Kong Deal on Agriculture for African Countries: a multilevel analysis[1]

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Draft 25/4/06

Very Preliminary Draft: Not for Quotation; comments welcome

[1] The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the UNECA.

I. Introduction

In addition to the need for African countries to reform their agricultural policies, it is also very important to participate actively in the current multilateral negotiations on agricultural trade under the DDA according the Hong Kong's declaration. The current agricultural trade barriers conjoined with exports subsidies and domestic support has lead to inefficiencies in the allocation of resources in both countries using these policies and on their trading partners. Although there is a consensus that eliminating global policy distortions in agricultural markets could lead to significant welfare gains. Nevertheless, concerns have been expressed on the potential short and medium-term negative effects on some African countries, while some others will partially benefit from the removal of these distortions. The sensitivity of the African countries to eliminating of global policy distortions in agricultural markets is justified by the crucial role that this sector is still playing in these economies. Accordingly, its contribution to GDP varies among countries of the continent, ranging from a high of about 50 to 60% for Liberia and Guinea Bissau to as low as less than 5% for South Africa and Botswana. However, it is important to note that the limited contribution of agriculture to GDP in some African countries does not reflect its contribution in employment. Most countries tend to have a sizeable agricultural population (20 to 90%) with a few exceptions (less than 15% in Libya and South Africa for examples).

Given the high contribution of the agricultural sector in the African economies, any agreement on the instruments of implementing the Hong Kong's declaration on agricultural trade liberalization will certainly affect the economies of these countries much more than any other region in the world. These effects may include growth and trade balance as well as employment and poverty patterns in the region. Given its political significance both in the developed and the developing countries, agriculture was certainly at the heart of the Doha negotiation, although it accounted for 10% of world trade. Accordingly, the EU and US agricultural policy represented the dominant issue of the DDA. Both have policies that are significantly protectionist, imposing tariffs and quotas on agricultural imports. In addition, they also provide production subsidies to producers. The total estimated value of developed country agricultural subsidies and protections is $300 billion, six times larger than total foreign aid from these countries.[2] Direct production subsidies in the EU and the USA amount around $100 billion $50 billion[3], respectively. Their effect is to diminish the developing countries access to the developed countries markets, while driving global prices of agricultural products down by encouraging excess production.

This situation has lead to three main effects. The first two effects are linked to the driving down of global prices of some agricultural products as result of agricultural policies implemented in the developed countries. Accordingly, these policies have increased the competitiveness of developed countries' agricultural products on international markets, reducing the export levels of some African countries exporting the same products. The cases of Cotton and Banana, which are produced and exported by many African countries, are among this category of products. At the same time, and for many other African countries net importers of other agricultural products, such as cereals and sugar, benefited from an import prices much lower than the real costs which, would have prevailed in a pure and perfect competition. This level of prices has allowed some African countries to reduce their food bill, which has already weighed on the equilibrium of their balances of foreign payments. The third effect is related to the high level of tariff and non-tariff protection applied in most developed countries as part of their agricultural policies. These barriers have adversely affected the degree of openness of the

[2] World Bank, Cancun Trade Talks an Opportunity to Lift Millions out of Poverty, September 4, 2003.
[3] Ibid.

developed countries' markets for some other agricultural products while traditionally exported by African countries, this may include fruits and vegetables products.

For these reasons, the agriculture sector in the African countries is inseparable from any changes in the world market and from agricultural policies implemented in rich countries. Under these conditions, it is crucial to research to what extent and cost, the economies of the African continent will be affected by the any of the potential modalities of implementing the Hong Kong's declaration on reducing global distortions in agricultural trade. While the final ministerial declaration contained some minor gains on agriculture[4], most of the crucial decisions on agriculture have simply been deferred to the year 2006. On the main agricultural issues, work remains to be done within an implausible deadline of 30 April 2006 for agreement on modalities, and comprehensive country schedules by 31 July 2006. Moreover, the text offers few opportunities for increased access to Northern markets, which are able to protect an unspecified number of 'sensitive products' — a loophole that drastically reduces the value of any overall reductions. Thus, the issues are complicated and the upcoming negotiations are crucial for African countries to enhance their participation in international trade by improving their competitiveness edge on the developed countries' markets. Accordingly, how should the African countries position themselves with respect to the ongoing multilateral negotiations on the status of agriculture in world trade? What are the potential effects of agricultural trade liberalization on welfare, employment, and growth? Some issues have to be addressed for a better understanding of the challenges and opportunities for Africa's agriculture in the context of multilateral trade reforms. The paper attempts to address these questions utilizing quantitative tools related to trade liberalization analysis.

In situation where a large number of distortions are present, the theory of international trade is inadequate if used alone and we must used computational tools in an attempt to assess the consequences of the multilateral reforms described. Computable general equilibrium models (CGE) are usually used for this. Their main advantage lies in offering a coherent framework for analysis based on highly detailed statistics and a fully explored corpus of economic theory. The extensive use of these models in developing countries is mainly due to the fact that they can be run on the basis of a one-year database. There is a large body of qualitative as well as quantitative research regarding the effect of multilateral agricultural trade liberalization (Anderson et al, 2006; Bouet et al., 2003 and 2004; Keeney et al., 2005). However, there are no detailed studies on the issue of the effect of multilateral agricultural trade liberalization under the DDA on a single African country using a top-down approach combining a global as well as a country framework. Almost, all the empirical research focuses on only one or a few dimensions of this very complex process. Most studies focus only on the implications of the DDA on the agriculture sector in selected countries or in the whole continent. To our knowledge, none of the modeling studies takes into account the complex international environment within which the DDA will be implemented as well as the main features of the country studies such as the labor market segmentation as well as the trade and fiscal policies. Furthermore, and given the sensitivity of model's results to the closure rules adopted and the parameters selected, global

[4] For example, while the year 2013 is settled as an end date for export subsidies, it still not clear how much developed countries have to reduce export subsidies before this deadline. Furthermore, there was also strengthened language on domestic support which, should lead to cuts into rich country subsidies, not just the difference between bound and applied levels, but the wording gives no real insurance concerning the closing down of the loopholes that enable countries to exempt their subsidies via the Green Box. Although the wording is ambiguous, the text opens the way for tightening disciplines on the notorious Blue Box.

models are not suitable to evaluate the effects of these reforms on a single country. Thus, the impact analysis provided by these studies can sometimes by completely misleading. Finally, there is a lack of consistency in the modeling framework in the existing literature. A large number of papers on Africa countries use general equilibrium modeling, most of the time in static framework, while the implementation of DDA will be progressively during many years. This sequential dimension of the implementation of DDA related to the agriculture sector is very important given the adjustment effect of the economy during the reform phase which can not captured by static models. Accordingly, both the issue of coordination of policies and the net effect over time of these policies is also important and justifies the use of dynamic models. Furthermore, single-country models are not appropriate to analyze the impact of multilateral trade agreements and by taking ad hoc estimation of international price changes and foreign demand many provide misleading, incomplete, and inconsistent results. For these reasons, global framework is the best tool for assessing the effects of multilateral liberalization, since it produces interactions between countries, on international price and bilateral demand changes. However, country models are much more suitable to assess the effects of these changes in international prices and foreign demand at country level. The approach to be used in this paper is the "sequential global-country or top-down framework". The global model will be used to evaluate the suggested reforms in agricultural policies in developed countries, mainly the EU and the USA on the world economy and international prices of agricultural products. The link with the country model is through a vector of international prices for the main agricultural products and the changes in foreign demand on a specific product towards a given country. The country model will be based on a very detailed database, which will integrate the most important instruments of economic policy implemented in this country. This work represents the continuity of past modeling efforts undertaken by the ECA (see for instance ECA, 2005) to assess the effects of multilateral trade liberalization in agricultural products on African countries. In this paper, Morocco will be the only country study given that according the results of the global model, it will loses from the implementation of DDA on agricultural trade. The analysis will be conducted as follows. Section II highlights the challenges faced by African countries under the DDA negotiations on agricultural trade with a special differentiation of net importing and exporting countries. This section also reviews the Arusha declaration versus the Hong Kong agreement on agricultural trade. Section III evaluates the effects of every proposal on the African continent using both a dynamic global CGE model and a country CGE models. Section IV draws conclusions and policy recommendations.

II. Opportunities and challenges of multilateral negotiations on trade of agricultural products for African countries

II. 1. Agriculture sector in Africa. Africa's agriculture is a quite diverse sector whose contribution to economic development is important considering the stage of development of the countries of the continent. Its contribution to GDP is relatively diverse ranging from a high of more than 50% for Burundi and Central Africa to a low of less than 5% for South Africa and Botswana. However, the importance of agriculture sector is more pronounced for the sub-Saharan Africa. It employs some 70 per cent of the region's work force and generates an average 30 per cent of the region's gross domestic product. This high contribution to GDP is reflected also in the contribution of agricultural sector in the economic growth achieved by African countries. For the year 2003, the contribution of the agricultural sector in economic growth is

also relatively diverse ranging from a high of more than 80% for Mali to as low as 0% for Zimbabwe. Table 1 shows some basic indicators on the importance of agricultural sector in many African economies. Given the importance of agriculture in the total GDP, the African countries can be divided into three main categories. The first category includes the African countries that have succeeded in diversifying their economies, and whose agricultural contribution in the GDP has strongly regressed (less than 20%). The second category features the African countries, highly dependent on the exportation of natural resources, such as oil and gas, without being able to give the necessary importance to the diversification of their economies (agricultural contribution to GDP less than 10%). The third and last category of African economies includes the countries that have not been able to diversify their economies, and whose agricultural sector continues to play a dominant role (more than 20%).

For the first category of African countries, despite the continuous decrease of the agricultural sector's contribution as much at the level of their GDP as at the level of their exports, due to the development of the service and industry sectors, the agricultural sector continues to play an important role in these economies[5]. In fact, its importance is still manifested at the level of the active population that it employs, the reduction of the trade balance deficit, and especially the regional equilibrium in these countries. The agricultural sector keeps on limiting the rural exodus, and ensuring supplementary incomes to an important section of the population that works in the non-agricultural sectors. Tunisia and Morocco figure among the countries of this group. For both, and despite the continuous decrease of their agricultural sector's share in their economies, its contribution in the total economic growth remains, nonetheless, significant. Thus, in 2003, the agricultural sector contributed up to 10 % of the total growth of Tunisia and 0% for Morocco[6]. In other words, for an increase in the GDP equal to 6.5 %, realized by Tunisia in 2003, 0.65 points of increase come from agriculture. The agricultural sector still plays an important role in the labor market and in the reduction of unemployment. Within this framework, almost 39% of the active populations are still employed by the agricultural sector, respectively in Tunisia and Morocco.

For the second group of African countries, characterized by the dominance of the exportation of natural resources on their economies, the need to develop the agricultural sector as part of a global strategy of diversification has become a priority. In fact, since the beginning of the 1970s, these countries have been able to achieve high living standards, compared with other African countries, and their economies have progressively moved towards economies dominated by the public sector. The wages granted by the public sector to the employees, have been over-valued and have induced the renunciation of the agricultural activity, which does not generate

[5] 15.6 % and 11.9 % of the contribution to the GDP and 8.7 % and 6.4 % in the total exports, respectively for Tunisia and Morocco.

[6] The year 2003 is a draught year and agricultural production declined intensively. This is way this year does not reflect the real importance of the agricultural sector in the Moroccan economy given that Agriculture drives the Morocco's total GDP as it accounts for nearly 20 percent of the country's total GDP and employs around 40 percent of the local labor force during the past four decades. Thus, when annual growth in agricultural GDP averaged 6.7 percent between 1980 and 1990, annual growth in total GDP averaged 4.2 percent and when growth in agriculture dropped to -1.3 percent between 1990 and 2000, growth in total GDP averaged 2.2 percent. Furthermore, in 1999 and 2000, average growth in agricultural GDP were -19.8 and -14.0 respectively as result of draught conditions, total GDP declines by 0.7 in 1999 and grow only by 0.8 percent in 2000 (Chemingui, 2005).

competitive incomes. However, confronted to the sudden drop of the prices of oil products, since the middle of the 1980s and throughout the 1990s, the governments of these countries have no longer been able to afford the necessary resources to carry on financing a growing public sector. In parallel with these budgetary problems, the labor supply keeps on accumulating, and the economy has become more and more marginalized. The development of the agricultural sector has become a priority in the development strategies of these countries. This strategy has been adopted since the beginning of the 1990s, and the objectives that have been assigned to the agricultural sector keep on broadening. Thus, for this group of countries, which is the least dependent on the agricultural sector, the development of this sector takes on specific importance.

The African countries belong to a group where the agricultural sector continues to play a propelling role in their economic and social development. Given its weight in the GDP (more than 20%) and its role at the social level (employment of more than 50% of the active population), the agricultural sector contributes up to 5% of the total exportations of products. For these countries, the development of the agricultural sector and consolidation of its competitiveness is considered to be vital. In fact, in the countries, characterized by too high levels of unemployment and poverty, and lacking the perspectives of diversification, the development of the agricultural sector is considered as the only means to improve their situation.

From this brief description of the importance of the agricultural sector in the African economies, it is evident that even in the countries that are least dependent on this sector the development of the agricultural sector takes on a particular importance. Thus, in the countries, where the economies are most diversified, the agricultural sector continues to play an important role in the macro-economic balances, alongside its social importance. Concerning the countries that mainly depend on the exportation of natural resources, the population growth and the volatility of the international prices of these products, make the diversification of their economies the best option to face up to the challenges met by these economies. In this context, the development of the agricultural sector also seems to be a pillar of this strategy. Finally, for the African countries that are most dependent on the agricultural sector, the development of this sector is all the more vital for their economies, which are confronted to various structural problems.

Africa is considered as a net food-importing region, except some African countries such as South Africa. The largest share of imported products consists of food products (cereals, livestock and dairy products and fruits and vegetables to a less extent). Exports of agricultural products constitute an important source of foreign currency for several African countries. Its contribution to total goods exports is also relatively diverse ranging from a high of more than 80% for Sudan and Burundi to a low of less than 1% for Gabon and Equatorial-Guinea for example. Their first client is the EU to which an important share of agricultural commodities is exported. The most important commodities exported fall within the following group: fish and crustaceans, fruits and nuts, cotton, and vegetables.

Despite signs of economic recovery for some African countries, and as result of higher energy prices, most of them still suffer from a burden of structural problems as well as social and economic low achievements. In fact, to the high levels of unemployment and poverty incidences, African countries are moving slowly towards the global and regional integration. Most of these challenges could be related in one way or another to the performance of agriculture sector, given its significant contribution to growth and employment. A better market access to developed countries' markets and a significant reform in agricultural policies in these countries, will surely

improve the competitiveness of African agricultural products on international markets, which, will leads to a higher and sustainable economic growth.

Table 1: Basic Indicators on the Importance of Agriculture in African Countries

	Agriculture as share of GDP, %	Labor Force in Agriculture as % in total	Agricultural Exports as % of total goods exports	Real agricultural GDP growth rate (%)	Real growth of GDP at market prices (%)	Contribution of agriculture sector to GDP growth rate (%)	Contribution of the rest of activities to GDP growth rate (%)
	2003	1990	1997	2003	2003	2003	2003
Algeria	8.6	26.1	0.6	4.0	3.9	10	90
Angola	8.2	74.5	0.1	11.7	3.4	30	70
Benin	35.7	63.5	57.2	5.0	5.6	30	70
Botswana	2.4	19.7	3.9	0.3	5.4	0.0	100
Burkina Faso	31.0	92.4	44.6	0.0	6.5	0.0	100
Burundi	51.0	14.8	85.2	-0.8	-1.2	30	70
Cameroon	43.1	69.7	21.9	6.8	4.5	70	30
Cape Verde	6.8	31	0.0	1.5	5.0	0.0	100
Comoros	41.1	77.3	10.0	2.9	2.1	60	40
Congo	6.2	48.7	0.8	6.3	0.8	50	50
Egypt. Arab Rep.	..	39	3.0	..	4.5		
Equatorial Guinea	4.6	74.7	0.9	-11.7	14.7	0.0	100
Eritrea	12.6	80.5	1.1	10.8	3.0	50	50
Gabon	8.1	51.6	0.3	5.4	2.8	20	80
Gambia The	27.0	82	6.3	19.7	6.7	80	20
Ghana	35.2	62.2	27.6	4.6	5.2	30	70
Guinea	23.4	87.2	6.3	2.9	1.2	60	40
Kenya	14.0	19.1	38.9	1.5	1.8	10	90
Liberia	52.8	72.3		..	-31.0		
Libya	..	10.9		..	..		
Madagascar	26.8	78.2	11.8	1.3	9.8	0.0	1.0
Malawi	36.3	54	63.1	7.3	4.4	60	40
Mali	35.1	85.8	41.9	17.7	7.4	80	20
Mauritania	16.8	55.2	9.4	0.2	5.4	0.0	100
Morocco	15.6	39	8.7	1.0	3.4	0.0	100
Mozambique	24.1	82.7	9.9	7.7	7.1	30	70
Namibia	9.7	53.4	11.6	3.2	3.7	10	90
Niger	39.9	7.8	15.0	6.0	5.3	50	50
Nigeria	26.1	2.9	3.2	4.1	10.7	10	90
Sao Tome and Principe	17.1	..	26.3	3.2	4.5	10	90
Senegal	16.8	76.7	4.5	19.2	6.5	50	50
Seychelles	2.6	..	0.5	1.0	-6.3	0.0	100
Sudan	30.5	69.5	86.3	..	6.0		
Swaziland	7.6	24	27.6	0.3	2.4	0.0	100
Tanzania	41.3	84.2	31.4	4.0	7.1	20	80
Tunisia	11.9	38.9	6.4	6.5	6.5	10	90
Uganda	29.7	89.6	48.3	2.3	4.7	10	90
Zambia	20.7	74.7	4.3	5.0	5.1	20	80
Zimbabwe	15.7	24.3	36.5	-4.1	-14.0	0.0	100

Source: WB (2005) and authors' calculations

II.2. Africa's Concern in DDA negotiations on Agricultural: Since the launch of the agriculture talks in 2001 under the DDA, the Africa Group of WTO negotiators has submitted some sets of proposals. Many African countries have also submitted individual proposals, or joined with other countries and blocs on specific issues. Many of the African proposals address concerns in three of the areas mandated for reform at Doha: securing "substantial improvements" in market access, reduction ("with a view to phasing out") all export subsidies and "substantial

reduction" of domestic support deemed "trade distorting." In this section, these concerns are highlighted to reiterate the importance for an ambitious Doha Round outcome in agricultural negotiations.

II.2.1. Improved market access. The desire for effective market access for African export products has been one of the major issues for the African countries. Thus, improving market access for agricultural exports is one of the key concerns of the African countries. While it is acknowledged that African countries do enjoy preferences under different schemes that are currently in place, such as African Growth and Opportunity Act (AGOA) and the Everything-But-Arms (EBA), or even the Cotonou preferences, it is also the case that there are significantly high tariffs, tariff peaks and tariff escalation concerns which limit African exports. The African countries have therefore been keen on a Doha Round outcome that would effectively eliminate tariff peaks and lead to significant reductions on all tariffs, especially in those products of the continent's export interests. And in order to allow the African countries to add value to the many primary products that the continent currently exports, there has been concern that the final modalities for tariff reduction should also deal with the problem of tariff escalation. Tariff escalation has tended to create a disincentive for the African countries to carry out vertical diversification that would lead to the production of products for exports that are of higher value in the value chain.

II.2.2. Phasing out of export subsidies and trade distorting domestic support measures. Domestic support programs, export subsidies and other export competition issues have been another area of major concern for African countries in the on-going negotiations. These subsidies, be they for domestic production support or for the exporters have been shown to have substantial distorting effects on international markets. These schemes are prominently used by the major developing countries in support of their agriculture sectors. The costs of the distortions from these subsidy programs are borne by other agricultural producers and exporters, especially in developing countries including the LDCs, who may not be in a position to receive similar support from their governments. The distortion effects on the international cotton market of the subsidies provided to cotton farmers in the US has been a classic example of how domestic policies in developed countries end up hurting producers in poorer countries.

For the reason that domestic support programs and export subsidies provided to agricultural producers and exporters in the developed countries distort international agricultural markets, ambitious agricultural reforms have been a major issue for Africa. Elimination of the export subsidies and substantial reduction of the domestic support measures is seen as one way through which African countries can benefit from the comparative advantage that they possess in agricultural production. Moreover, the phasing out of these subsidy schemes would also be fundamental in the creation of a level playing field, even in the African agricultural market itself, where African producers would be in a position to increase the share of intra-African trade on agricultural commodities.

Overall and more specifically, the key aspects of Africa's agenda at the agriculture talks include:

- rapid elimination of export subsidies
- reductions of domestic "trade distorting" support in developed countries

- reduction of tariff peaks and escalations on developing country exports
- tariff- and quota-free market access for least developed countries (LDCs)
- implementation of existing measures to help LDCs and food-importing developing countries overcome any negative effects of liberalization
- expansion of special measures for developing countries, including use of domestic supports and tariffs, to assist small-scale farmers and enhance food security
- prohibition of market liberalization and subsidy reduction requirements exceeding WTO standards by donors and international financial institutions
- standardization and rationalization of food safety and processing requirements
- and maintenance of existing market access preferences under bilateral, and multilateral trade agreements, such as the US's Africa Growth and Opportunity Act.

II.3. The Hong Kong's declaration on agricultural. The collapse of the previous ministerial meeting in Cancun was remedied by an agreement in Geneva in July 2004 setting out a framework for the remainder of the round. Since then, however, progress in Geneva had been minimal. Then in October 2005, in order to rekindle momentum just before Hong Kong, the USA and EU made proposals on agriculture that purported to offer major progress on the three 'pillars' of the agriculture agreement (domestic support, export competition, and market access). The EU focused on what it called a 'development package' of measures such as agreeing an amendment to the TRIPS (Trade-Related Aspects of Intellectual Property Rights) agreement to improve access to patented medicines for poor countries; duty-free, quota-free market access for LDCs (least developed countries); 'aid for trade'; and measures to address the problem of 'preference erosion'. However, sceptics portrayed the development package as an attempt to divert attention from the need for reform of the Common Agricultural Policy (CAP). Although these proposals were judged not enough or just a mere diversion, (offering few or no real cuts in subsidies or tariffs and insisting on numerous loopholes to allow governments to continue to heavily subsidizes agriculture and dump the surplus on world markets), they led to revived discussions with other trading partners and raised hopes of progress in Hong Kong.

The Hong Kong Ministerial (Dec 13-18) was supposed to set up an agreement for the current Doha round of trade talks. The round aims to cut trade barriers across a wide range of sectors and is supposed to address the needs of developing countries, for which agriculture is a particularly sensitive topic. In a new report "*What happened in Hong Kong?*" published on 20.12.2005, Oxfam says that unless the EU and US make immediate and genuine offers to reform their domestic farm subsidies and open their markets to developing countries, then the talks could quickly become mired a long slow round stretching into the next decade. "This would prolong an unjust world trading system that condemns developing countries to poverty."

The final ministerial declaration contained some minor gains on agriculture, such as setting a 2013 – clearly linked to the period when the current CAP reforms will be fully operational – as an end date for export subsidies (paragraph 6)[7]. However, what matters is that what the word 'substantial' means, in terms of how much export subsidies have to be reduced

[7] Moreover, the text contains deliberately vague language calling on members not to wait until the last moment, but to 'frontload' subsidy cuts early in the period between an agreement and 2013

before 2013. Another outcome consist in providing developing countries with extra flexibility to protect their small farmers (paragraph 7)[8]. The final declaration also sets a deadline of April 30 for working out a detailed blueprint for the negotiations, which would include specific figures for reducing agricultural tariffs and subsidies. The declaration also introduces a direct link between the Doha round negotiations on agriculture and industrial market access. The text asks negotiators to "ensure that there is a comparably high level of ambition in market access for agricultural and NAMA". It the states that this ambition is to be achieved in "a balanced and proportional manner" consistent with the principle of special and differential treatment. This mean that tariff cuts in agriculture and industrial market access should be about equal, some observers said. Alternatively, it could mean that countries should not have to reduce their industrial tariffs to the degree that developed countries cut their agriculture tariffs (Inside US trade, 2005).

As far as domestic support (paragraph 5) is concerned, which should lead to cuts into rich country subsidies, not just the difference between bound and applied levels, there is no real insurance concerning the closing down of the loopholes that enable countries to exempt their subsidies via the Green Box. Although the wording is ambiguous, the text opens the way for tightening disciplines on the notorious Blue Box. In this respect, the declaration calls for a greater reduction to overall trade-distorting domestic subsidies than to so-called amber box support. Cuts to the overall subsidies would be made from the sum of the amounts spent on three categories of subsidies. There is the amber box supports covering the most trade-distorting subsidies plus the payments that can be exempted from those disciplines as de minimis payments and the payments defined as blue box support considered less trade distorting. The text also mentions that "disciplines will be developed to achieve effective cuts" in trade-distorting subsidies, without expressly mentioning the blue box[9]. But Brazil, the EU and other members have pushed for additional disciplines on the new blue box as a way to curb U.S. counter-cyclical payments (Inside US trade, 2005).

On agricultural market access, the declaration locks in the ability of developing countries to self-designate "an appropriate number of tariff lines" as special products, which they could shield from market access concessions. The text says members are to select these products based on the criteria of food security, livelihood security and rural development. It also specifies that developing countries will have recourse to a special safeguard mechanism based on import quantity and price tiggers, and calls for precise arrangements to be further defined. Additionally, the text highlights the importance of the special products and special safeguard provisions by stating they are an integral part of the modalities and the outcome of the agriculture negotiations. Regarding the issue of sensitive products that countries can exempt from a formula tariff cut, the final declaration recognizes "the need to agree on treatment of sensitive products, taking into account all the elements involved". However, the declaration makes no progress on the tariff-

[8] While not accepting the G33's proposal that developing countries should be able to designate up to of 20 per cent of all tariff lines as special products; it merely talks of an 'appropriate number' to be negotiated in Geneva in 2006.

[9] Brazil and other members of G20 calls for a greater reduction to overall trade-distorting domestic subsidies than to so-called amber box support. Brazil has pushed for this language as one means to prevent the U.S. from shifting its subsidies from the amber to the blue box, as well as to the minimis exemption. This is crucial since in a July 2004 framework, members agreed to create a new blue box designed to cover U.S. counter-cyclical farm payments, which rise in relation to falling world prices. Without this new blue box, the counter-cyclical subsidies would have to be counted towards the ceiling of the amber box, or be exempted from that as de minimis support (Inside US trade, 2005).

cutting formula, partly because the EU made it clear before Hong Kong that it would discuss no specific numbers at the ministerial. The text merely calls for the adoption of four bands for structuring tariff cuts, with higher tariffs in bands that would be subject to higher cuts. It does not define these bands and says this decision will be taken later.

There was also some progress on preventing the abuse of food aid as a disguised form of dumping, but on cotton, the steps agreed fell short even of those required by the cotton panel ruling against the USA. In fact, and while the case of Cotton received a particular attention during the negotiations, the approved deal consists of eliminating the US export subsidies. However, it is not the cotton subsidies that the US has promised to remove by 2006.

The meeting in Hong Kong led to mix feelings. From one side and according many NGOs, Hong Kong was a missed opportunity to make trade fair. “Rich countries put their own interests ahead of poorer countries. Small progress in agriculture was cancelled out by anti-development proposals on services and industrial tariffs”.

While all the areas of negotiations are critical to delivering pro-development results favorable to African and other developing countries, taking a critical look at the text and proposals on modalities for the agriculture negotiations, it is possible to give an assessment regarding whether Africa’s concerns are being addressed. Some convergence was attained at Hong Kong for some of the areas in the agriculture negotiations, especially in the export competition pillar, but significant divergences remain in the other two pillars. It is evident that the levels of ambition in each of these pillars vary. The US for instance makes an ambitious proposition in the market access pillar by proposing that the highest tariffs in agriculture should be cut by as much as 90 per cent. The EU and G-20 are on the other hand proposing higher reductions in domestic support. A summary of the elements on modalities development as contained in the Hong Kong text under a number of the areas of negotiations is provided in Annex 1 of this paper. This is compared with Africa’s expectations as contained in the African Union Ministers of Trade Cairo and Arusha Declarations.

Regarding commitments on Cotton, and in reality, as some estimates show it does not translate to more than $ 30 million, which is not even a drop in the ocean for American cotton growers. The US provides barely 1.4 per cent of the global export subsidies. In 2004, US cotton farmers got federal support to the tune of $ 4 billion, which means $ 10.1 million a day. In 2005, UN Human Development Report 2005 states the cotton growers were paid an additional $ 700 million thereby jacking up the total subsidy to reach a staggering figure of $ 4.7 billion. It is this huge subsidy support; much of it considered non-trade distorting that actually causes the global prices to slump. Indian cotton growers or for that matter cotton farmers in western Africa are thereby priced out of the international market. The Hong Kong declaration does not talk about reduction in domestic support in case of cotton. All it says is: "as an outcome of negotiations, trade distorting domestic subsidies for cotton production should be reduced," which in trade terms means practically nothing. In fact, the contentious issue of domestic support for agriculture has remained untouched.

III: The Impact of implementing the Hong Kong's Declaration on agriculture

III. 1. The current structure of bilateral tariffs for African agricultural trade. With the tarification of most NTBs in the countries members of WTO after the implementation of Uruguay Round agreement on agriculture, tariffs became increasingly the primary policy instrument for protecting domestic agriculture sectors in most countries.[10] It is than necessary to analyze the structure and the magnitude of the current global tariffs imposed on agricultural trade in order to get a full picture of their impact. Accordingly, we examine in this section both the current structure of tariffs imposed on African agricultural exports to the rest of the world as well as tariffs that African countries themselves apply on their imports of agricultural products from the rest of the world. Furthermore, we analyze the expected trends in both tariffs imposed on agricultural trade (from and to African countries) that will result from the implementation of the alternative scenarios of multilateral agricultural liberalization as part of the implementation of DDA's ministerial declaration of Honk Kong on agricultural trade. In this respect, both defensive as well as offensive interests of African countries are reviewed by analyzing how the developed countries market will be opened for African exports (offensive interest) and what the final modalities would do the African agricultural development strategies (defensive interests). In other terms, the openness that will occur in the developed countries markets for African exports and the level of new protection of the Africa agriculture sector are two crucial elements of this analysis. In our analysis, we are based on GTAP database, which uses tariffs revenue that are effectively collected and divided by the value of import of every sector. However, rather than using tariff rates estimated directly from GTAP database who are based on trade weighted techniques, we used the MacMap database which estimate tariff rates using the technique of Reference Group Weighted[11]

Tables in annex 2 gives data on import tariffs imposed by African countries on their imports of agricultural products from other countries and regions of the world as well as tariffs imposed by the other countries and regions of the world on their imports of agricultural products from African countries and regions. The same table gives the expected trends on tariffs; both applied by African countries on their imports and imposed on their exports, for the different simulations and by the end of the implementation period 2015. Concerning the initial tariff structure imposed bilaterally between some countries and regions estimated from MacMap database, figures show that tariffs imposed by the rest of the world on African countries agricultural exports are mostly very low, except for some products and some regions from the rest of the world. For Tunisia and Morocco, data shows that the G20 countries seem to be the more protective of their domestic agricultural sector. Average tariffs imposed by these countries vary between 18 and 90% with the highest rates applied on plants based fiber and cereals for Tunisia and on vegetables and fruits for Morocco. For the European Union, the tariffs applied are higher for cereals; fishing; and vegetables and fruits imported from Tunisia and on vegetables

[10] However, many other instruments a more trade restrictive than tariffs. This may include the exchange rate regime, trade facilitation measures, norms and quality control, rule of origins, and quota rates. For many countries, these instruments play a protective role much more than tariffs, mostly in the case of agricultural trade. The case of North African Countries is the best example of the existence of other restrictions that tariffs. For these countries, tariffs on agricultural imports from North African Countries to the European Union are not seen as the most restrictive instrument given that most of their exports are realized under a free quota regime which allows a high protection for European products during the periods of high supply.

[11] More information on tariffs definition and categories could be found in Hinkle et al.

and fruits and raw sugar from Morocco. As far as Japan is concerned, the high tariff rates are only applied on its imports of oil seeds from both countries. The USA seems to be the most opened market, behind the group of CairDv, where relatively high tariffs are applied on oil seeds and plants based fibers. For the rest of North African countries, mostly represented by Egypt who is the most exporter for agricultural products, high tariffs are applied by the EU on Egyptian exports of raw sugar, paddy rice, wheat and other cereals. The USA However, a very high tariffs are applied by Japan on its imports of paddy rice followed by a high on oil seeds imported from this region. The group of CairDd applied a relatively high tariffs only on wheat imports from this region however, the structure of tariffs applied by the group of G20 on their imports of agricultural products from the rest of North Africa region is almost the same as those applied on imports from Tunisia and Morocco. Regarding agricultural exports of the rest of African countries (RSADAC, RSCU, RSSAHAF, and SAF), the most protective country still Japan whom his applying the highest tariffs among all countries and regions. Japan is followed by the European Union, and then by group of G20. The USA seems to be the less protective countries behind the group of CaiDd. Turning now to the expected trends of tariff structure to be applied on African exports under the different scenarios of implementing DDA ministerial declaration. The simulations results show that tariffs imposed by developed countries on African exports will observe a high decline which means a high improvement of market access for African countries. However, the degree of openness of the markets of the other regions will be much more slower than what will be observed for developed countries. It is clear that the implementation of the alternative scenarios will improve the level of market openness for African countries, mostly those for developed countries.

From a defensive point of view, African countries impose very high tariffs on all their imports of agricultural products from all origins. However, the tariff reduction schema adopted in the different alternative scenarios will improve remarkably the level of openness of African countries to imported agricultural products. The degree of openness will be as higher as the bound tariffs as lower given that reduction will be based on bound tariffs and not on applied tariffs. Tables in annex 2 presents the current tariff structure applied by African countries and regions on their imports of agricultural products from the rest of the world as well as the expected trends in tariffs expected by implementing each one of the fourth scenarios.

It is noteworthy to note that these figures give a good and clear view about the bilateral tariff applied among countries and regions, but it is important to clarify that tariff structure are losing its importance in trade regulation. In fact, with the implementation of many FTAs between some African countries and their main partners from the developed world, tariffs are not more the main obstacle of trade between these partners. Tunisia and Morocco for example realize more than 90% of their agricultural exports free of duties in the context of tariff quota and other regulations. At the same time, most of European exports to these countries are realized also under a tariff quota offered by Tunisia and Morocco for most of their imported products under their respective commitments in the context of GATT agreement. It is than crucial to note that economic effects of phasing out or reducing these tariffs could not enhance trade between regions given that trade is already regulated by bilateral agreements than multilateral agreements for most countries and mainly for agricultural products. In addition, the issue of trade facilitation and sanitary and phyto-sanitary norms are currently playing a major obstacle in reducing trade flows.

III. 2. The global analysis

III.2.1. Overview of the MIRAGE model. This section provides a short description of the MIRAGE model. The MIRAGE model has been constructed in order to assess the impact of globalization on the individual regions in the global economy. The model is a relatively standard neo-classical model of economic activity. It is based on the latest release of the GTAP data set, version 6.0. The model is designed for analyzing dynamic scenarios. The scenarios are solved as a sequence of static equilibrium, with the periods being linked by dynamic variables — population and labor growth, capital accumulation, and productivity. Policy scenarios are compared to a baseline, or business-as-usual, scenario.

The following section briefly describes the dimensions of the model and its main features[12]. The mapping from the GTAP regional and sector definitions to the corresponding aggregations defined for the MIRAGE model used in this study is provided in Annex 3.

As far as dimensions are concerned, there are 3 essential dimensions for the MIRAGE model. The table below provides a complete description. Due to the existence of a flexible aggregation facility, the regional and sectoral definitions of the model are easy to modify. The aggregation defined in Annex 3 describes the scope of the MIRAGE model for the current study.

Table 2: Dimension of MIRAGE Model

Index	Description
I	Sectors (see Annex 3 for MIRAGE model dimensions)
r	Regions (see Annex 3 for MIRAGE model dimensions)
t	Time (currently 2001-2015)

In what fellows, we present briefly the main characteristics of the model, which concern the modeling of demand, supply, capital, markets clearing and macroeconomic closure, and dynamic. Given the importance of domestic supply in the distortions currently affecting world trade in agricultural products, a short description of how domestic supply is modeled in MIRAGE is provided directly after presenting the main blocs of the model.

Demand. The demand side is modeled in each region through a representative agent, whose utility function is intra-temporal, with a fixed share of the regional income allocated to savings, the rest used to purchase final consumption.[13] Below this first-tier Cobb-Douglas function, consumption trade-off across sectors is represented through a LES-CES function. Each sectoral sub-utility function is a nesting of CES functions, comparable to the standard nested Armington – Dixit-Stiglitz function (see e.g. Harrison et al., 1997), with two exceptions. Firstly, domestic products are assumed to benefit from a specific status for consumers, making them less substitutable to foreign products than foreign products between each other. Secondly, products

[12] The complete and detailed technical specification of MIRAGE model can be found in Bchir et al (2005)
[13] The structure of the demand function is shown in Appendix 6.

originating in developing countries and in developed countries are assumed to belong to different quality ranges[14].

Supply. Production makes use of five factors: capital, labor (skilled and unskilled), land and natural resources. The first three are generic factors; the last two are specific factors. The production function assumes perfect complementarity between value added and intermediate consumption. The sectoral composition of the intermediate consumption aggregate stems from a CES function. For each sector of origin, the nesting is the same as for final consumption, meaning that the sector bundle has the same structure for final and intermediate consumption. The structure of value added is intended to take into account the well-documented skill-capital relative complementarity. These two factors are thus bundled separately, with a lower elasticity of substitution (0.6), while a higher substitutability (elasticity 1.1) is assumed between this bundle and other factors. Constant returns to scale and perfect competition are assumed to hold in agricultural sectors.

Capital, markets clearing and macroeconomic closure. The capital good is the same whatever the use sector, and capital is assumed to be perfectly mobile across sectors within each region. At the region-wide level, capital stock is assumed to be constant in the core simulations of this paper. Natural resources are also perfectly immobile and may not be accumulated. Both types of labor, as well as land, are assumed to be perfectly mobile across sectors. Production factors are assumed to be fully employed. All production factors are immobile internationally. As to macroeconomic closure, the current balance is assumed to be exogenous (and equal to its initial value in real terms), while real exchange rates are endogenous.

Dynamics. In a typical recursive dynamic framework, the time path of the model is solved as a sequence of static equilibrium in each year. In other words, the solution in any given year is not a function of forward looking variables, though it may be an explicit function of past variables, though known and therefore exogenous. While there are drawbacks in the recursive dynamic framework, particularly in the modeling of saving and investment behavior, its one key advantage is that it is much easier to set up and solve (van der Mensbrugghe, 1998). There are several backward linkages linking one period to another: population growth, productivity increases, and capital accumulation. Most of these linkages can be resolved outside of the modeling framework, or in other words, in between solution periods. One of the exceptions is the capital accumulation function. Before running any policy simulations in a dynamic framework, it is often required to define some sort of reference scenario, or as it is sometimes called, a business-as-usual scenario (BaU). The BaU scenario makes some assumptions about a broad range of dynamic variables — population and labor supply growth rates, the growth rate of factor productivity, and other exogenous variables. If all productivity variables are pre-determined, as well as the population growth rates, the growth rate of real GDP is endogenous. However, the path trend in real GDP growth may be unrealistic, or at least inconsistent with the assumed trend from other studies or prospective outlooks. One way to resolve this dilemma is to make the growth of real GDP exogenous in the reference scenario, and to allow some other variable pick up the slack. In subsequent simulations, i.e. in simulations with policy shocks, the growth rate of

[14] This is motivated by the fact that, following Abd-El-Rahman (1991), several empirical works have shown that, even at the most detailed level of classification (Combined Nomenclature, 10 digits, including more than 10,000 products), unit values differences are able to reveal quality differences (see e.g. Fontagné et al., 1998; Greenaway and Torstensson, 2000).

capital and labor productivity, are exogenous, and it is the growth of real GDP and the capital-labor ratio, which are endogenous.

Mechanisms of implementing domestic support. While an agricultural version of MIRAGE was developed by Bouet et al (2004), which integrates a detailed modeling of the instruments of domestic support applied by the European and US, we turned for using a more simplest way of modeling domestic support given the non-linearity of Bouet's version. This non-linearity could not allow running the dynamic version of MIRAGE. The approach used here for modeling domestic support follows the one developed by Walsh (2004)[15]. The results of the dispatching of PSE are presented in the following table.

Table 3: Results of Dispatching Domestic Support

	EU25	USA	Japan
Output Subsidies			
Amber	96.1	92.9	30.1
Blue	0.0	0.0	33.9
Green	3.9	7.1	36.0
Intermediate subsidies			
Amber	89.7	90.5	74.3
Blue	1.8	0.0	0.0
Green	8.5	9.5	25.7
Land-based Payments			
Amber	0.5	3.1	93.1
Blue	79.8	0.0	0.0
Green	19.7	96.9	6.9
Capital-based Payments			
Amber	6.5	91.6	84.6
Blue	51	0	0
Green	42.5	8.4	15.4

Source Walsh et al (2004)
Note: data are in percentage of distribution of domestic support among the three components for each county and each category.

To perform reduction in domestic support in the alternative scenarios, three major steps were forwarded. The first step consist of computing the new bound of domestic support level and then the level of applied support, which is defined as the minimum between the new bound level

[15] In the GTAP database, the direct payments reported in the GTAP model are allocated to four different categories: output subsidies, intermediate input subsidies, land-based payments and capital-based payments. The source of the agricultural support data for non-market price support protection in industrialized countries is based on the estimation of the Producer Support Equivalent (PSE) carried out by the OECD (2002a). Walsh et al (2004) dispatch the amount allocated to each category of subsidies among the three boxes defined by the WTO.

and the current applied level. This step is justified by the fact that cuts formulas are have to be applied on the bound support. The second step consists of taking into account the differences existing between the 2001 domestic support level, which is notified to WTO, and the level of support existing in the GTAP database. In order to address this issue, we simply computed the rate of increase of applied support as notified in the WTO and then we applied the rate of cut to the support level figured in the GTAP database. Finally, the implementation of the cut is done through endogenizing domestic support and exogenizing the new level of support.

III.2.2. Description of simulations. After calibrating the baseline scenario that represents the business as usual growth path, we implement a number of alternative trade scenarios. Each scenario seeks to provide insights into possible trade deals on agricultural products under the DDA. In particular, we perform four alternative scenarios. The main difference between the scenarios is only on the market access pillar. The domestic support and the export competition pillars are the same in all the four scenarios. Therefore, the differences that are seen with respect to economic impacts, have got more to do with the market access pillar than with the other pillars although the economic impacts should be read as the combined outcome of market access, domestic support, and export competition liberalization. The scenarios are defined as follows:

Scenario 1: This scenario has the deepest cuts for developed countries (akin to US proposal) but conservative cuts for developing countries (akin to ACP proposal). The sensitive products are fixed at 1% of agriculture tariff lines for developed countries and at 20% of agriculture tariff lines for developing countries. The sensitive and/or special products were defined for each country to be the percentage of lines representing the highest MFN rates. Numerically, this scenario consists of the following commitments:

Table 4: Market access commitments under the first scenario

Tariff band (%)	Cuts by developed countries	Cuts by developing countries	LDC
0-20%	65%	20%	No liberalization
20-40%	75%	25%	
40-60%	85%	28%	
Above 60%	90%	30%	

Scenario 2: This scenario captures the G-20 proposal. In this simulation, we consider that sensitive and/or special products represent 2% of agriculture tariff lines for developed countries and 20% of agriculture tariff lines for developing countries. The different commitments to be implemented by developed, developing, and less developing countries are displayed in the table 5 below.

Table 5: Market access commitments under the second scenario

Tariff band (%)	Cuts by developed countries	Cuts by developing countries	LDC
0-20%	20%	15%	No liberalization

20-40%	30%	20%	
40-60%	35%	25%	
Above 60%	42%	30%	

Scenario 3. This scenario defines higher thresholds for the four tiers but applies the same tariff cuts as in scenario 1. Under this simulation, sensitive products represent now 8% of agriculture tariff lines for developed countries and 20% of agriculture tariff lines for developing countries.

Table 6: Market access commitments under the fourth scenario

Developed countries		*Developing countries*		LDC
Tariff threshold	Cuts	Tariff threshold	Cuts	
0-20%	65%	0-20%	20%	No liberalization
20-40%	75%	20-40%	25%	
40-60%	85%	40-60%	28%	
Above 60%	90%	Above 60%	30%	

Scenario 4: This scenario has higher threshold for developing countries and slightly lesser cuts for the same. Similar to the first scenario, sensitive products represent only 1% of agriculture tariff lines for developed countries and 20% of agriculture tariff lines for developing countries. Commitments by developed and developing countries are summarized in table 7.

Table 7: Market access commitments under the fifth scenario

Developed countries		*Developing countries*		LDC
Tariff threshold	Cuts	Tariff threshold	Cuts	
0-20%	65%	0-50%	25%	No liberalization
20-40%	75%	50-100%	30%	
40-60%	85%	100-150%	35%	
Above 60%	90%	Above 150%	40%	

For all scenarios, we also assume that only developed countries will reduce their domestic support pillar. The date of implementation is 2007 over 5 years. Table 8 describes the reduction schema. Furthermore, we assume that the export subsidies will be eliminated at 2013 for developed countries. Finally, and regarding market access commitments, we consider that the liberalization of agricultural products is supposed to be implemented as from 2007 in a linear manner during 5 years for developed countries and 7 years for developing countries for all simulations.

Table 8: Reduction Schema

Final Bound Total AMS Bands	Thresholds (US$ billion)	Developed countries cuts
1	0-10	70%
2	10-60	75%
3	>60	80%
Amber Box Bands	Thresholds (US$ billion)	Developed countries cuts
1	0-12	60%
2	12-25	70%
3	>25	83%

For the benefit for interpreting the economic impact results, for the four scenarios below, the liberalization of agricultural products is supposed to be implemented as from 2007 in a linear manner during 5 years for developed countries and 7 years for developing countries.

On the basis of the contents of each of the fourth scenarios described above, the first one, which did not includes sensitive products and with deep cuts, could be considered as the most ambitious scenario. However, the third scenario presents the lower ambition in the market access given the high rate of sensitive products among the agriculture tariff lines. The second scenario is less ambitious than the first scenario but more ambitious than the third and the fourth one.

III.2.3. Simulations Results. The results of the four scenarios are shown in Annex 4. For the GDP, results indicate deviations from base values, given the simulated changes according to each of the 4 scenarios described above. The implementation of the first scenario will be manifested by improvements in GDP levels for all African countries until the year 2010. However, the phasing out of export subsidies will affect negatively all African countries, except Tunisia and the Rest of SADAC countries. While the amplitude of gains is small, we can consider that the overall effect of this scenario is positive. In this respect, this scenario produce a 1.32 percentage point increase in the overall growth performance of the Tunisian economy and 0.70 percentage point increase in GDP of the Rest of SADAC economies. However, the effect of implementing the first scenario generates a very small gain for Morocco in respect of GDP changes before cutting export subsidies. North Africa region will be affected negatively by the implementation of the first scenario both before and after phasing out export subsidies. As far as the other African countries are concerned (South Africa, Rest of SACU, and Rest of Sub-Saharan Africa), the GDP experienced the same trend as for Morocco. While these results are largely due to the increase of world prices of agricultural products and the ability of each country and region to take advantage from it, the phasing out of export subsidies will have a negative impact on most African countries and will overcome the positive impact of the two other pillars (market access and domestic support). Tunisia seems to be the only winner country from cutting export subsidies, this is largely due to a relatively decline in the cost of inputs for the food processing sector in comparison to the European Union, which will be manifested by an improvement of the

Tunisian competitiveness level on the European Market and a spurs increase of the exports of this sector. However, these results should be explained by the absence of quota limitation of Tunisian exports on the European market. These quotas imposed on most Tunisian exports of agricultural and food products are at the origin of the high protective offered to the European domestic market and by the way are limiting the expansion of many agri-food sectors in Tunisia. This instrument of protection (quota) is not considered in the MIRAGE model, which justify again the needs to develop a specific country model able to take into account the main features of supply and demand. The implementation of three next scenarios (scenarios 2, 3 and 4) does not generate a better performance in terms of total economic performance than the first scenario. The changes in GDP and welfare are slightly lower than in the first scenario. For Tunisia, GDP produce almost the same percentage point increase for scenario 4 than scenario 1 in the year 2007. However, some additional gains are expected during the years 2010 and 2015 when the fourth scenario is implemented. However, the implementation of the second and the third scenario will generates a lower increase in GDP during all the simulation period. For the rest of African countries, only the implementation of the scenario 4 generates the same effects as the scenario 1. The other scenarios (2 and 3), will either generates a lower increase of GDP or accentuate the decline in overall economic performance compared to the first scenario and this during all the simulation period. For Morocco, only the implementation of the third scenario will generates a better economic performance than all the other scenarios. This specific situation could be explained by the positive effect linked with the differentiation of level of tariffs cut between developed and developing countries with the level of bound tariffs. The commitments to reduce tariffs by 30% on rates above 60% in Morocco against 90% cuts in developed countries, will improve slightly the competitiveness of Moroccan agricultural products on European markets. For the rest of African regions (South Africa, Rest of SACU, Rest of SADAC, and Rest of Sub-Saharan Africa), the level of impact is highly linked with the level of ambitions, except for the fourth scenario, which produces almost the same effect on GDP as the first scenario.

For the economy-wide welfare, most of African countries would experience a significant gain, mainly before implementing export subsidies commitments. For Tunisia, the implementation of all the scenarios will generates a positive welfare gain with the highest levels in scenarios 1 and 4. However, scenario 2 will generate the lowest level of welfare increase. For Morocco, the net effects of welfare will be negative in all scenarios. The rest of North Africa experienced the same welfare changes than Morocco. However, for the rest of African countries and regions, welfare changes are positive (except Rest of SADAC countries) for all simulations during the period 2007 and 2010. However, the implementation of export subsidies since 2013 will affect negatively the welfare of the Rest of sub-Saharan Africa and the Rest of SACU given that these countries are considered as a net importer of food products and are not able to increase domestic production to a level able to compensate the increase of import bills. South Africa seems to be insures a welfare gains in all cases. Overall, it is only when export subsidies are removed that most African regions and countries experienced more sensitive effects on GDP as well as on welfare.

As far as impact on trade balance is concerned, results of the four simulations show that African countries could be divided in two groups: a group where trade balance will experience a net improvement and a second group for which a deterioration of trade balance is expected. The first group includes Tunisia, Rest of SACU, Rest of SADAC Countries, and the Rest of sub-Saharan Africa. Morocco, Rest of North Africa, and South Africa represent the second group. The difference in the level of impact of these scenarios on the trade balance between the two

groups of countries and regions could be explained by the relative highest level of growth of import and exports of agricultural and food products for these countries during the simulation periods. For countries, who will benefits from these reforms by increasing their level of economic growth, the effect on trade balance will be positive while for those who will be affected negatively by these reforms, the effect on trade balances will be negative.

As it is expected, the overall impact of the different reforms tested in the present study is an increase of the international prices of agricultural products and especially the most protected ones, such as cereals and sugar. The increase is much higher when exports subsidies are phased out than in the other reforms. The overall gains for each country depends on its capacity to take profit from the new situation by increasing domestic production and exports much higher than the increase in import bills of agricultural and food products. Detailed results on sectoral value added changes linked to every single simulation show clearly that those countries whose experienced the higher gains are those who succeeded in increasing their domestic production at a very high levels. For Morocco, which will be a losers from these reforms, sectoral value added for agricultural and food processing sectors grew much lower than Tunisia.

Overall, simulation results show that ambitious coefficients in agriculture remain the best result for Africa. Africa loses through sensitive products what it is supposed to gain from the ambitious tariffs cut. A trade-off by the advanced developing countries on market access that would reduce ambition may not be in Africa's interest.

Notwithstanding the results of the four scenarios, the anticipated effects of implementing commitments for more transparency in international trade of agricultural products appear to be relatively low given the low diversification of the African countries and the dominance of few activities in GDP and exports. The countries experienced more benefits from these scenarios are those more diversified.

Finally, our results confirm the outcomes of past studies on quantifying the effects of agricultural trade liberalization. As shown in the study by Cernat et al. (2002), tariff cuts for agricultural goods yield higher gains than elimination of subsidies, mostly for developing countries net importers of food products. In this respect, reduction of subsidies should go hand-in-hand with agricultural tariff reductions in order to ensure win-win outcomes. Moreover, and as suggested by many other studies (Francois et al, 2003; Cernat et al, 2002; Hertel and Martin, 2001; and IMF & World Bank, 2002), a comprehensive tariff reduction strategy covering agricultural and non-agricultural goods is better than a partial approach. The estimation carried out by Cernat et al. (2002), show that global welfare gains from a 50% tariff reduction in agricultural protection across the globe would be nearly doubled by a comprehensive tariff reduction covering agricultural and industrial goods.

III.3. The country level analysis. Knowing the change in the link variables resulting from every alternative scenario of implementing agricultural reforms under the DDA, the country model will evaluate the effects of these changes in international prices and foreign demand addressed to this country on its economy. A dynamic country CGE model is developed specially for Morocco taking into account the main features of the agricultural sector as well as the economic policy implemented during the simulation period. The model will provides an assessment of the direct,

indirect and induced economic impacts of international prices changes and foreign demand addressed to Moroccan agricultural products.

III.3.1. Agricultural sector in Morocco. Macroeconomic stability coupled with relatively slow economic growth characterize the Moroccan economy over the past several years. Despite many efforts to modernize and diversify the economy, however, it remains overly dependent on the agriculture sector. Morocco's primary economic challenge is to accelerate growth in order to reduce high levels of unemployment and poverty. Economic growth, however, has been erratic and relatively slow, partially as a result of an over-reliance on the agriculture sector. Agriculture production is extremely susceptible to rainfall levels and ranges from 13% to 20% of GDP. Given that almost 50% of Morocco's population depends directly on agriculture production, droughts have a severe knock-on effect to the economy. Since the adoption of the sectoral adjustment program in mid 80s, many reforms are being implemented in order to enhance the competitiveness of the Moroccan economy and to promote exports. The main reforms undertaken since the mid 90s cover the trade policy. In this respect, a Free Trade Agreements with the United States and the European Union are signed. The agreement with the United States has been ratified on July 22, 2004, while the agreement with the EU is to take effect by 2010. Like many other small countries, Morocco would be under the repercussions of the multilateral agreements, which would affect the world prices of the country exported and imported products in addition to the foreign demand addressed to its products. In fact, the GATT agreement, along with the reduction of subsidies on agricultural production and exportation as well as the supplementary reductions, intended as part of the present cycle of multilateral negotiations, could lead, in the medium term, to an increase of the world prices of subsidized agricultural products supplied mainly by the European Union and the United States. Consequently, this could reduce the competitiveness of the American and European agricultural products as much on their respective markets as on the Moroccan market, in the context of establishing the two free-trade areas. Furthermore, the reduction of tariff protection on agricultural products could add to the competitiveness pressures that the Moroccan farmers must face up on the internal market. On the other hand, by contrast, the abolishment of tariffs on industrial products could provide the Moroccan agriculture with an increased effective protection, compared with that of the other sectors of the economy. Moreover, the constraints on natural resources could grow and limit any perspective of expansion for the agricultural sector.

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Obviously, the current multilateral talks on agricultural trade liberalization will creates some opportunities for the Moroccan economy in general and for the agricultural sector specifically, but also will face the country to new challenges. Providing a detailed estimation of cost and benefits linked to these negotiations will be one of the main advantage of this study, which for the first time links a global model to a country model.

III.3.2. The main features of the country dynamic model. The economy-wide modeling approach used here is based on a standard CGE model developed at IFPRI (Lofgren, Harris & Robinson 2002). However, the model applied here is a dynamic version of the standard CGE model following Robinson & Thurlow (2004). In order to account for the full 'dynamic' effect of policy and non-policy changes, Thurlow (2003) and Robinson and Thurlow (2004) have extended the static model described in Lofgren et al. (2004) to a recursive dynamic model in which selected parameters are updated based on the modeling of inter-temporal behavior and results from previous periods. Current economic conditions, such as the availability of capital,

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are endogenously dependent on past outcomes but remain unaffected by forward-looking expectations. The dynamic model is also exogenously updated to reflect demographic and technological changes that are based on observed or separately calculated projected trends. Most of these time-trends are adopted from the respective Moroccan government agencies and reported in more detail in the model calibration section below.

The dynamic model developed in this study is formulated as a simultaneous equation system, including both linear and non-linear equations. The equations define the behavior of the agents, including the equilibrium conditions, macro balances, and dynamic updating equations.

The model belongs to the recursive strand of the dynamic CGE literature, which is used more extensively in policy analysis than alternative intertemporal optimization models. A recursive model may be solved one period at time. The equations may be divided into a within-period module, which defines the decisions in each time period (this is the same structure as for the static model), and a between-period module, which provides a link between different periods. All agents (private and public) are myopic, making their decisions on the basis of past and current conditions with no explicit role for the future.

The process of capital accumulation is modeled endogenously, with previous-period investment generating new capital stock for the subsequent period. Although the allocation of new capital across sectors is influenced by each sector's initial share of aggregate capital income, the final sectoral allocation of capital in the current period is dependent on the capital depreciation rate and on sectoral profit-rate differentials from the previous period. Sectors with above-average capital returns receive a larger share of the new capital stock than their current share in capital income. The converse is true for sectors where capital returns are below average.

Population and growth in the number of workers are examples of variables that evolve over time and as such, are given to the model. Thus, population growth is exogenously imposed on the model based on separately calculated growth projections. It is assumed that a growing population generates a higher level of consumption demand and therefore raises the supernumerary income level of household consumption within the LES demand system. Both labor supply and total factor productivity (TFP) growth are updated exogenously based on information obtained from the past studies and different ministerial sources. Labor is also updated on the basis of exogenous trends.

The dynamic model is solved for the period 1998-2015 as a series of equilibrium, with each equilibrium representing a single year. Each model solution generates and extensive, economy-wide dataset on the state of the economy in each solution period. By imposing the above policy-independent dynamic adjustments, the model produces a projected or counterfactual growth path. Policy changes can then be expressed in terms of changes in relevant exogenous parameters and the model is re-solved for a new series of equilibriums. Differences between the policy-influenced growth path and that of the counterfactual can then be interpreted as the economy-wide impact of the simulated policy. In our analysis, we summarize this information to a manageable set of policy-relevant indicators, including data on macroeconomic growth, sectoral trade and production, labor demand, and government spending.

The model uses the information contained in the Social Accounting Matrix built by IFPRI Team for the year 1998 and adjusted for the requirements of the present study. It considers 24 activities and 24 commodities along them 18 are related to agricultural and food processing activities. The model includes also 3 categories of labor, five categories of households, two trade partners, and many fiscal instruments.

III.3.3. Baseline economic growth scenario

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III.3.4. Alternative scenarios. After calibrating the baseline scenario that represents the business as usual growth path, we implement a number of alternative trade scenarios. Each scenario seeks to provide insights into possible policy options and external chocks. In particular, we perform four alternative scenarios as follows:

REFOR1: Implementing Moroccan commitments on tariff reduction under scenario 1 with the expected effect of DDA on international price and foreign demand changes.

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REFOR2: Implementing Moroccan commitments on tariff reduction under scenario 2 with the expected effect of DDA on international price and foreign demand changes.

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REFOR3: Implementing Moroccan commitments on tariff reduction under scenario 3 with the expected effect of DDA on international price and foreign demand changes

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REFOR4: Implementing Moroccan commitments on tariff reduction under scenario 4 with the expected effect of DDA on international price and foreign demand changes

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IV. Conclusion and policy recommendations

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Annex 1:

Negotiations on Agriculture: Declaration of Hong Kong on Agriculture Negotiations compared with Africa's expectations as contained in the African Union Ministers of Trade Cairo and Arusha Declarations.

Issue compared	Cairo Declaration on Agriculture	Arusha Declaration on agriculture	Hong Kong Ministerial Declaration on agriculture
Market Access: preference erosion	Specific and concrete mechanisms to address the problems of preference erosion	Specific and concrete mechanisms to address the problems of preference erosion, including through designation of sensitive products by developed countries	The importance of preferences is emphasized. There is a convergence on the need to reinforce capacity building on this matter, but divergence on the mechanisms to put into place to limit preferences erosion.
Market access: formula and cuts for African countries	Take into account the particular pattern of trade of African countries and their different tariff structures	a) Full operationalization of the principle of proportionality in the reduction of tariffs, and the need to take into account the different tariff structures of Members;	Agreement on the principle of four bands for structuring tariffs cuts, but no convergence on the threshold and cuts inside the bands. Lesser commitment of the developing countries, but general divergence on the threshold and cuts applied by these countries.
Market access: tariff escalation	The issue of tariff escalation must be addressed fully in accordance with paragraph 36 of the Framework Agreement without prejudice to the products benefiting from preferential arrangements,	Substantial improvement in market access for products of export interest to African countries. In this regard, special attention should be given to tariff escalation, tariff peaks and non-tariff barriers;	Clear divergence among WTO members on the tariffs caps. Some members reject this concept, other propose a differentiated cap for developed countries (75%-100%), and developing ones (150%).
Market access: full market access for LDCs	Developed countries, and other developing countries in a position to do so, must provide bound duty and quota free market access to agricultural products originating in LDCs	-	Unrestricted market access for LDCs is still discussed by WTO members.

Market access: Sensitive and Special Products, and Special Safeguard mechanism	[…] the development of meaningful modalities on Special Products (SPs) and the Special Safeguard Mechanism (SSM). […]Modalities with respect to the designation of special products and treatment must be devised in a way that provides maximum flexibility to countries in Africa to reflect their particular domestic circumstances and development needs	Designation and treatment of the special products must be devised in a way that provides maximum flexibility to the African countries to reflect particular domestic circumstances and development needs .The SSM to be established for the developing countries should be operationally effective to address the specific circumstances of the African Countries;	Divergence among WTO members on the number for sensitive products. The proposals range from 1% to as much of 15% of the tariff lines for the developed countries. The treatment of the sensitive products is also debated. The WTO members agree on the principle of a greater flexibility for developing countries regarding sensitive products. They are also discussing on the criteria to designate the special products, as well as their type of treatment. It has been proposed that developing countries could designate at least 20% of their agricultural tariff lines as special products.

<table>
<tr>
<td>Domestic support: formula for cuts</td>
<td>the formula to be agreed must result in meaningful and effective reductions in the subsidies granted by the major trading partners to their farming communities. […] disciplines on domestic support (DS) should not lead to “box-shifting” the subsidies,

African countries must be allowed to maintain policy space […],</td>
<td>Modalities should include disciplines to prevent box shifting;

African countries must be exempted from de minimis and AMS reduction commitments;

African countries must be allowed to maintain policy space for the development […]

African countries underline the importance of meeting the Doha objective of real reductions in trade distorting domestic support.</td>
<td>On the overall cut, the following formula is proposed:

<table><tr><td>Bands</td><td>Thresholds (US$ billion)</td><td>Developed countries cuts</td></tr><tr><td>1</td><td>0-10</td><td>31% - 70%</td></tr><tr><td>2</td><td>10-60</td><td>53% - 75%</td></tr><tr><td>3</td><td>>60</td><td>70% - 80%</td></tr></table>
With respect to reductions in the amber box measures, the following formula should apply:

<table><tr><td>Bands</td><td>Thresholds (US$ billion)</td><td>Developed countries cuts</td></tr><tr><td>1</td><td>0-12/15</td><td>37% - 60%</td></tr><tr><td>2</td><td>12/15-25</td><td>60% - 70%</td></tr><tr><td>3</td><td>>25</td><td>70% - 83%</td></tr></table>
50%-80% cuts for de minimis tariffs applied y developed countries, reduced cuts / no cut at all for developing countries.</td>
</tr>
<tr>
<td>Domestic support: blue box and box shifting</td>
<td>Disciplines on domestic support (DS) should not lead to “box-shifting” the subsidies,</td>
<td>The tightening of the criteria for the Blue Box measures is critical;

Modalities should include disciplines to prevent box shifting;</td>
<td>Agreement on further constraining the use of the blue box. Discussion on the technique for achieving it, with two proposals: either reducing the current 5% ceiling to 2.5%, or increasing the discipline related to this type of domestic support.</td>
</tr>
</table>

Domestic support: green box	The developed countries must engage in the review and clarification of the green box criteria in a manner that will ensure that the green-box measures have no or at most minimal trade-distorting effects or effects on production.	Need to review the Green Box Criteria to provide policy space for developing countries; Review and tighten the Green Box Criteria for developed countries to ensure that it is non or minimally trade distorting;	Convergence on the need to make the Green Box more "development friendly", but divergence among WTO members on the rest of the discussion.
Export competition: end date	Place emphasis on the need for a credible end date for the elimination of all forms of export subsidies on agricultural products. This elimination shall be without prejudice to S&D treatment of NFIDCs and LDCs,	Stress the need for the elimination of all forms of export subsidies on agricultural products by 2010. This elimination shall be without prejudice to S&D treatment of NFIDCs and LDCs;	The WTO members agreed to ensure the parallel elimination of export subsidies and disciplines in all export measures with equivalent effects to be completed by the end of 2013. Convergence on disciplines with respect to export credits, export credit guarantee or insurance programmes with repayment periods of 180 days and below.
Cotton	Recommends to: - Eliminate all export subsidies and domestic support measures on cotton, - Set up an emergency support fund for African countries and - Grant bound quota- and duty-free market access for cotton and its by – products from African LDCs, that are cotton producers and exporters. Besides, bilateral and multilateral donors are urged to meet their commitment on the development-related aspects of the cotton initiative.	Stresses the need for: - Total elimination by the 31st December 2005 of export subsidies; - Substantial reductions of domestic support measures that distort trade on cotton in three steps. - Elaboration of disciplines that prevent shifting of domestic support between different boxes - Setting up of Emergency Fund to address cotton revenue deficits resulting from cotton price depressions in the international markets; - Mobilization of the technical and financial assistance.	The WTO members agreed that: – All forms of export subsidies for cotton will be eliminated by developed countries in 2006 – On market access, developed countries will give duty and quota free access for cotton exports from least-developed countries (LDCs) from the commencement of the implementation period. – Trade distorting domestic subsidies for cotton production should be reduced more ambitiously than under whatever general formula is agreed and that it should be implemented over a shorter period of time than generally applicable.

Annex 2

Exporter	TUN																													
Average of Value	Importer																													
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	3.6	1.0	0.9	1.0	0.9	0.9	26.0	56.8	13.8	49.8	19.9	13.8	9.0	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Forestry	0.3	0.1	0.0	0.1	0.0	0.0	0.6	0.1	0.1	0.1	0.1	0.1	0.7	0.2	0.2	0.2	0.2	0.2	18.0	9.3	7.7	8.1	7.8	7.4	0.1	0.0	0.0	0.0	0.0	0.0
Fishing	0.3	0.2	0.2	0.2	0.2	0.2	14.3	0.0	0.0	0.0	0.0	0.0	3.8	3.5	3.5	3.5	3.5	3.5	22.3	6.5	6.5	6.5	6.5	6.5	0.3	0.1	0.0	0.1	0.0	0.0
Cereal grains nec	0.8	0.0	0.0	0.0	0.0	0.0	56.0	21.5	6.8	21.2	9.5	6.8	24.8	27.6	7.3	20.0	7.6	7.3	58.1	19.3	19.1	19.1	19.1	19.1	1.1	0.0	0.0	0.0	0.0	0.0
Animal products nec	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	7.1	7.1	7.1	7.1	7.1	7.1	17.8	5.7	4.8	5.0	4.8	4.6	4.2	0.0	0.0	0.0	0.0	0.0
Crops nec	2.0	0.5	0.3	0.5	0.3	0.3	6.6	1.7	1.3	1.7	1.3	1.3	1.6	0.1	0.1	0.1	0.1	0.1	37.8	14.1	13.1	13.4	13.2	13.0	4.6	0.8	0.6	0.8	0.8	0.6
Oil seeds	0.4	0.2	0.1	0.2	0.2	0.1	0.9	0.0	0.0	0.0	0.0	0.0	98.5	2.2	2.2	2.2	2.2	2.2	23.1	14.1	11.6	12.2	11.7	11.2	20.0	14.7	14.7	14.7	14.7	14.7
Plant-based fibers	0.0	0.0	0.0	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	89.7	4.5	4.5	4.5	4.5	4.5	14.9	2.5	2.5	2.5	2.5	2.5
Vegetables, fruit, nuts	0.4	0.3	0.1	0.2	0.1	0.1	11.7	3.9	3.3	3.8	3.5	3.3	3.6	3.6	0.9	2.5	1.3	0.9	29.2	17.8	14.9	15.6	14.9	14.4	9.5	9.2	3.3	7.4	3.3	3.3
Wool, silk-worm cocoons	0.2	0.0	0.0	0.0	0.0	0.0	0.6	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	0.0	1.9	4.3	1.5	3.5	1.5	1.5

Exporter	MOR																													
Average of Value	Importer																													
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet	0.0	0.0	0.0	0.0	0.0	0.0	49.2	72.5	22.9	71.1	36.6	22.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	8.4	2.6	1.6	2.6	1.7	1.6	25.6	55.8	12.8	48.4	19.1	12.8	17.3	8.0	6.9	7.1	6.9	6.6	0.0	0.0	0.0	0.0	0.0	0.0
Forestry	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	22.8	8.6	7.4	7.7	7.5	7.2	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.3	0.2	0.2	0.2	0.2	0.2	12.0	0.0	0.0	0.0	0.0	0.0	4.4	4.2	4.1	4.2	4.1	4.1	28.2	16.4	16.2	16.2	16.2	16.1	0.5	0.0	0.0	0.0	0.0	0.0
Cereal grains nec	1.3	0.0	0.0	0.0	0.0	0.0	1.8	1.5	0.8	1.5	0.8	0.8	1.7	5.1	1.8	4.1	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Animal products nec	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.1	0.1	0.1	0.1	0.1	2.0	2.0	1.8	1.9	1.8	1.8	21.9	2.7	2.3	2.4	2.3	2.2	1.2	0.0	0.0	0.0	0.0	0.0
Crops nec	2.5	1.0	0.7	1.0	0.7	0.7	4.7	1.6	0.9	1.6	0.9	0.9	58.6	3.3	3.2	3.2	3.2	3.2	42.3	15.9	14.9	15.1	14.9	14.7	2.4	0.5	0.5	0.5	0.5	0.5
Oil seeds	0.4	0.2	0.1	0.2	0.2	0.1	0.9	0.0	0.0	0.0	0.0	0.0	76.1	1.9	1.9	1.9	1.9	1.9	18.2	8.4	6.9	7.2	7.0	6.7	13.8	9.9	1.4	9.9	9.9	1.4
Plant-based fibers	0.0	0.0	0.0	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	37.0	21.9	21.9	21.9	21.9	21.9	14.6	2.4	2.4	2.4	2.4	2.4
Vegetables, fruit, nuts	3.3	2.7	1.1	2.4	1.1	1.1	26.8	10.5	5.6	10.4	7.4	5.6	10.1	9.9	3.0	7.5	3.6	3.0	32.7	11.4	11.4	11.4	11.4	11.4	4.0	4.5	2.0	4.1	2.1	2.0
Wool, silk-worm cocoons	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	0.3	0.8	0.3	0.3

Exporter	RNA																											
Average of Value	Importer																											
	CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet	0.0	0.0	0.0	0.0	0.0	0.0	49.2	72.5	22.9	71.1	36.6	22.9	0.0	0.0	0.0	0.0	0.0	0.0	25.0	8.3	7.8	8.0	7.9	7.8	1.5	0.0	0.0	0.0	0.0	0.0
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	12.3	14.9	2.5	9.8	3.9	2.5	25.6	47.5	10.8	37.5	14.0	10.8	15.6	4.9	4.4	4.5	4.4	4.3	0.1	0.1	0.0	0.1	0.0	0.0
Forestry	0.4	0.1	0.1	0.1	0.1	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.1	0.1	0.1	22.5	10.8	9.1	9.5	9.2	8.8	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.7	0.3	0.3	0.3	0.3	0.3	9.2	2.8	2.8	2.8	2.8	2.8	3.7	3.0	2.9	3.0	2.9	2.9	18.2	11.5	11.2	11.3	11.2	11.1	1.2	1.0	0.5	0.8	0.5	0.5
Cereal grains nec	0.8	0.0	0.0	0.0	0.0	0.0	45.1	18.8	5.6	16.9	7.9	5.6	13.1	13.3	3.4	9.4	3.4	3.4	38.2	23.9	23.9	23.9	23.9	23.8	1.4	0.5	0.2	0.4	0.2	0.2
Animal products nec	0.5	0.2	0.0	0.2	0.2	0.0	1.4	0.2	0.1	0.2	0.2	0.1	0.4	0.4	0.2	0.3	0.2	0.2	18.2	3.8	3.3	3.4	3.3	3.2	0.3	0.1	0.1	0.1	0.1	0.1
Crops nec	1.1	0.2	0.1	0.2	0.1	0.1	3.5	0.7	0.5	0.7	0.5	0.5	16.8	1.1	1.1	1.1	1.1	1.1	34.8	15.5	14.0	14.4	14.1	13.8	2.0	0.2	0.2	0.2	0.2	0.2
Oil seeds	0.7	0.6	0.2	0.5	0.6	0.2	0.7	0.0	0.0	0.0	0.0	0.0	236.4	5.5	5.5	5.5	5.5	5.5	22.5	13.5	11.1	11.6	11.2	10.7	46.9	34.4	28.6	34.4	34.4	28.6
Paddy rice	0.2	0.0	0.0	0.0	0.0	0.0	80.2	65.6	10.8	53.1	65.6	10.8	1079.4	1054.4	1054.4	1054.4	1054.4	1054.4	68.6	13.8	13.8	13.8	13.8	13.8	6.1	5.7	2.0	4.5	2.0	2.0
Plant-based fibers	0.0	0.0	0.0	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	55.9	3.3	3.2	3.3	3.2	3.2	14.8	2.0	2.0	2.0	2.0	2.0
Vegetables, fruit, nuts	2.6	1.5	0.7	1.4	0.7	0.7	18.2	11.5	8.8	11.4	8.9	8.8	13.6	10.8	2.6	8.1	6.2	2.6	31.6	14.9	14.0	14.2	14.1	13.9	3.8	2.7	1.2	2.3	1.2	1.2
Wheat	47.9	1.8	1.8	1.8	1.8	1.8	68.6	1.8	1.7	1.7	1.7	1.7	350.2	200.2	38.8	200.2	200.2	38.8	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.8	1.3	3.1	1.3	1.3
Wool, silk-worm cocoons	0.2	0.0	0.0	0.0	0.0	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	32.8	2.9	2.8	2.9	2.8	2.8	1.2	2.0	0.7	1.6	0.7	0.7

Exporter	RSADAC																											
Average of Value	Importer																											
	CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	14.8	7.0	1.3	5.5	2.1	1.3	35.5	62.0	11.3	50.0	18.6	11.3	19.9	6.9	6.3	6.5	6.3	6.2	0.2	0.0	0.0	0.0	0.0	0.0
Forestry	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	14.7	3.0	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.7	0.1	0.1	0.1	0.1	0.1	9.6	0.0	0.0	0.0	0.0	0.0	4.7	4.1	3.4	4.0	3.4	3.4	31.8	18.6	18.6	18.6	18.6	18.5	0.5	0.0	0.0	0.0	0.0	0.0
Cereal grains nec	1.0	0.0	0.0	0.0	0.0	0.0	82.0	14.9	4.9	14.7	7.0	4.9	34.2	34.3	8.6	24.0	8.6	8.6	39.9	24.0	24.0	24.0	24.0	24.0	1.5	0.0	0.0	0.0	0.0	0.0
Animal products nec	0.4	0.1	0.0	0.1	0.1	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.1	0.2	0.1	0.1	28.5	6.3	5.9	6.0	5.9	5.8	0.9	0.0	0.0	0.0	0.0	0.0
Crops nec	7.2	0.4	0.3	0.4	0.3	0.3	14.5	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.1	0.2	0.1	0.1	33.3	13.8	13.8	13.8	13.8	13.8	47.5	11.9	6.0	11.9	11.9	6.0
Oil seeds	0.2	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	2.3	0.1	0.1	0.1	0.1	0.1	33.4	11.4	10.2	10.4	10.3	10.2	0.4	0.3	0.1	0.3	0.3	0.1
Paddy rice																			76.8	75.5	75.4	75.4	75.4	75.4						
Plant-based fibers	0.0	0.0	0.0	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	43.0	3.4	3.3	3.4	3.3	3.3	14.1	0.5	0.5	0.5	0.5	0.5
Vegetables, fruit, nuts	2.1	0.7	0.4	0.7	0.4	0.4	13.1	2.6	2.1	2.6	2.2	2.1	26.6	22.7	4.3	18.0	17.6	4.3	90.3	33.0	33.0	33.0	33.0	33.0	3.8	2.0	0.9	1.7	0.9	0.9
Wheat	57.1	0.6	0.6	0.6	0.6	0.6	52.0	0.0	0.0	0.0	0.0	0.0	376.7	65.3	12.6	65.3	65.3	12.6	92.5	90.6	90.6	90.6	90.6	90.6	2.9	0.0	0.0	0.0	0.0	0.0
Wool, silk-worm cocoons	9.1	1.1	1.1	1.1	1.1	1.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exporter	RSCU																											
Average of Value	Importer																											
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet																			26.3	7.3	7.3	7.3	7.3	7.3						
Cattle,sheep,goats,horses																			19.7	4.4	4.3	4.3	4.3	4.3						
Forestry	0.4	0.2	0.1	0.2	0.1	0.1	1.3	0.0	0.0	0.0	0.0	0.0	1.0	0.1	0.1	0.1	0.1	0.1	21.8	4.3	4.3	4.3	4.3	4.3	0.4	0	0	0	0	0
Fishing	0.0	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	5.2	5.2	5.2	5.2	5.2	5.2	31.9	9.8	9.8	9.8	9.8	9.8	0.9	0	0	0	0	0
Cereal grains nec																			45.1	21.2	21.2	21.2	21.2	21.2						
Animal products nec	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.7	5.3	4.9	5.0	4.9	4.8	0.1	0.0	0.0	0.0	0.0	0.0
Crops nec	1.0	0.2	0.1	0.2	0.1	0.1	2.4	0.0	0.0	0.0	0.0	0.0	14.0	1.6	1.2	1.5	1.2	1.2	25.7	8.9	8.2	8.4	8.3	8.2	3.4	0.5	0.2	0.5	0.5	0.2
Oil seeds	0.5	0.4	0.1	0.3	0.4	0.1	0.8	0.0	0.0	0.0	0.0	0.0	159.1	3.6	3.6	3.6	3.6	3.6	28.7	5.0	5.0	5.0	5.0	5.0	32.3	19.8	19.8	19.8	19.8	19.8
Paddy rice																			48.2	8.5	8.4	8.4	8.4	8.4						
Plant-based fibers	0.0	0.0	0.0	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	42.9	5.9	5.9	5.9	5.9	5.9	14.9	0.0	0.0	0.0	0.0	0.0
Vegetables, fruit, nuts	3.8	2.2	1.3	2.2	1.6	1.3	16.1	11.3	4.8	10.2	5.0	4.8	12.1	12.0	4.1	9.5	4.2	4.1	30.6	11.0	10.8	10.9	10.8	10.8	2.8	0.0	0.0	0.0	0.0	0.0
Wheat																			28.7	5.4	5.4	5.4	5.4	5.4						
Wool, silk-worm cocoons																			32.7	5.3	5.3	5.3	5.3	5.3						

Exporter	RSSAHAF																											
Average of Value	Importer																											
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet	0.0	0.0	0.0	0.0	0.0	0.0	52.8	5.9	2.4	5.9	3.7	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.2	0.1	0.2	0.1	0.1
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	24.1	0.0	0.0	0.0	0.0	0.0	11.5	6.8	4.1	6.3	4.6	4.1	21.0	4.6	4.6	4.6	4.6	4.6	0.6	0.0	0.0	0.0	0.0	0.0
Forestry	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	16.9	3.6	3.6	3.6	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.2	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	5.0	4.8	4.8	4.8	4.8	4.8	21.3	16.1	16.1	16.1	16.1	16.1	0.8	0.2	0.2	0.2	0.2	0.2
Cereal grains nec	0.3	0.0	0.0	0.0	0.0	0.0	26.0	0.1	0.0	0.1	0.0	0.0	16.8	5.8	5.1	5.6	5.1	5.1	58.9	28.9	28.9	28.9	28.9	28.9	1.6	1.0	1.0	1.0	1.0	1.0
Animal products nec	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	20.4	3.8	3.7	3.7	3.7	3.7	0.2	0.0	0.0	0.0	0.0	0.0
Crops nec	0.8	0.2	0.1	0.2	0.1	0.1	2.3	0.0	0.0	0.0	0.0	0.0	2.9	0.4	0.2	0.4	0.2	0.2	45.7	21.5	20.5	20.7	20.5	20.3	1.6	0.3	0.2	0.3	0.3	0.2
Oil seeds	0.3	0.1	0.1	0.1	0.1	0.1	0.9	0.0	0.0	0.0	0.0	0.0	36.0	0.9	0.9	0.9	0.9	0.9	22.9	10.7	10.5	10.5	10.5	10.5	7.1	4.6	3.1	4.6	4.6	3.1
Paddy rice	0.2	0.0	0.0	0.0	0.0	0.0	71.9	27.9	9.2	27.9	27.9	9.2	874.5	994.2	994.2	994.2	994.2	994.2	75.5	70.9	70.9	70.9	70.9	70.9	4.6	0.0	0.0	0.0	0.0	0.0
Plant-based fibers	0.0	0.0	0.0	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	48.2	3.1	3.1	3.1	3.1	3.0	14.5	1.9	1.9	1.9	1.9	1.9
Vegetables, fruit, nuts	1.0	0.5	0.2	0.5	0.3	0.2	33.2	12.1	3.0	11.9	12.0	3.0	14.5	11.3	6.3	10.5	7.2	6.3	85.8	31.6	31.5	31.6	31.6	31.5	2.3	0.3	0.1	0.3	0.1	0.1
Wheat																			89.8	85.0	84.9	85.0	85.0	84.9						
Wool, silk-worm cocoons	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.3	13.5	13.5	13.5	13.5	13.5	1.4	3.8	1.3	3.0	1.3	1.3

Importer	Morocco																											
Average of Value	Exporters																											
	CairDd						EU 25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							34	32.5	25.5	27.2	25.5	25.5							34	32.5	25.5	27.2	25.5	25.5	34	32.5	25.5	27.2	25.5	25.5
Cattle,sheep,goats,horses	195.6	195.4	195.3	195.3	195.3	195.3	175.5	174.0	173.7	173.8	173.7	173.7	34.0	5.7	4.8	5.0	4.8	4.8	198.4	197.5	197.2	197.3	197.2	197.2	39.9	23.6	23.4	23.4	23.4	23.4
Forestry	39.9	25.0	25.0	25.0	25.0	25.0	39.5	8.1	8.0	8.1	8.0	8.0	35.8	26.0	23.4	23.9	23.4	23.4	38.3	23.9	23.3	23.4	23.3	23.3	39.3	24.8	24.6	24.7	24.6	24.6
Fishing	39.4	39.2	38.9	39.0	38.9	38.9	39.8	38.4	38.4	38.4	38.4	38.4	39.1	38.8	38.0	38.2	38.0	38.0	39.0	38.9	37.7	37.9	37.7	37.7	39.4	39.3	38.9	39.0	38.9	38.9
Cereal grains nec	48.8	23.6	23.6	23.6	23.6	23.6	60.1	23.0	23.0	23.0	23.0	23.0	32.9	15.0	15.0	15.0	15.0	15.0	103.0	16.5	16.5	16.5	16.5	16.5	119.0	17.5	17.5	17.5	17.5	17.5
Animal products nec	34.0	21.0	19.4	19.7	19.4	19.4	32.4	17.2	14.7	15.2	14.7	14.5	34.0	19.0	18.7	18.8	18.7	18.7	32.3	27.1	23.1	24.0	23.2	23.0	33.1	20.5	19.0	19.4	19.0	19.0
Crops nec	28.7	22.5	19.7	20.5	19.7	19.5	30.5	20.1	18.0	18.5	18.0	17.9	21.9	9.4	8.0	8.4	8.0	8.0	33.4	23.4	20.5	21.1	20.5	20.4	31.1	17.3	16.5	16.7	16.5	16.4
Oil seeds	88.0	16.5	16.4	16.4	16.4	16.4	76.8	22.5	22.1	22.2	22.1	22.1	46.8	32.9	27.6	28.6	28.1	28.1	63.3	11.8	11.1	11.2	11.2	11.2	64.9	9.4	9.4	9.4	9.4	9.4
Paddy rice	98.0	94.6	94.6	94.6	94.6	94.6	98.0	96.7	96.7	96.7	96.7	96.7	98.0	97.9	97.9	97.9	97.9	97.9	98.0	96.8	96.8	96.8	96.8	96.8	98.0	94.9	94.9	94.9	94.9	94.9
Plant-based fibers	19.0	2.5	2.5	2.5	2.5	2.5	19.4	0.0	0.0	0.0	0.0	0.0	19.9	2.5	2.5	2.5	2.5	2.5	19.6	2.5	2.5	2.5	2.5	2.5	19.0	2.5	2.5	2.5	2.5	2.5
Vegetables, fruit, nuts	34.0	32.9	26.2	27.7	26.2	26.2	34.0	33.9	27.8	29.0	27.8	27.8	34.0	33.8	29.2	30.2	29.2	29.2	34.0	33.1	29.6	30.3	29.6	29.6	34.0	33.9	28.2	29.3	28.2	28.2
Wheat	88.2	28.3	28.3	28.3	28.3	28.3	92.6	29.4	29.4	29.4	29.4	29.4	94.4	29.9	29.9	29.9	29.9	29.9	93.6	29.7	29.7	29.7	29.7	29.7	92.3	29.3	29.3	29.3	29.3	29.3
Wool, silk-worm cocoons	23.0	2.5	2.5	2.5	2.5	2.5	27.9	0.2	0.2	0.2	0.2	0.2	37.6	5.9	5.9	5.9	5.9	5.9	25.3	3.8	3.8	3.8	3.8	3.8	33.5	2.8	2.8	2.8	2.8	2.8

Importer RNA																												
Average of Value	Exporter																											
	CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							30.0	22.0	22.0	22.0	22.0	22.0							30.0	22.0	22.0	22.0	22.0	22.0	30.0	22.8	22.8	22.8	22.8	22.8
Cattle,sheep,goats,horses	10.3	7.4	7.4	7.4	7.4	7.4	12.2	8.0	8.0	8.0	8.0	8.0	45.0	21.6	21.6	21.6	21.6	21.6	11.8	8.2	8.2	8.2	8.2	8.2	21.3	10.9	10.7	10.7	10.7	10.6
Forestry	20.5	5.0	5.0	5.0	5.0	5.0	19.8	5.1	5.0	5.0	5.0	5.0	17.9	10.6	10.0	10.1	10.0	9.8	18.6	6.5	6.3	6.3	6.3	6.2	20.7	6.6	6.5	6.5	6.5	6.5
Fishing	49.3	28.1	28.1	28.1	28.1	28.1	33.1	21.7	21.7	21.7	21.7	21.7	14.4	16.8	16.7	16.7	16.7	16.7	23.6	18.8	18.8	18.8	18.8	18.8	33.4	22.4	22.3	22.4	22.4	22.3
Cereal grains nec	9.6	6.0	6.0	6.0	6.0	6.0	9.0	5.9	5.9	5.9	5.9	5.9	6.8	4.2	4.2	4.2	4.2	4.2	5.3	5.3	5.3	5.3	5.3	5.3	5.1	5.7	5.7	5.7	5.7	5.7
Animal products nec	26.5	8.8	8.7	8.7	8.7	8.7	30.4	14.7	14.5	14.6	14.5	14.5	29.6	16.9	14.2	14.7	14.7	14.2	22.7	17.0	16.6	16.7	16.7	16.6	27.9	9.0	8.9	8.9	8.9	8.9
Crops nec	27.8	14.3	14.0	14.0	14.0	13.9	33.1	15.9	15.6	15.7	15.6	15.5	12.6	7.4	7.2	7.2	7.2	7.1	41.2	28.3	27.6	27.8	27.7	27.5	45.9	18.6	18.4	18.4	18.4	18.4
Oil seeds	5.7	5.7	5.2	5.3	5.2	5.1	8.0	5.9	5.6	5.7	5.6	5.5	24.0	11.6	11.6	11.6	11.6	11.6	11.6	4.7	4.7	4.7	4.7	4.7	10.0	3.8	3.8	3.8	3.8	3.8
Paddy rice	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5
Plant-based fibers	5.0	4.4	3.9	4.0	3.9	3.7	5.0	4.4	3.9	4.0	3.9	3.7	5.0	4.4	3.9	4.0	3.9	3.8	5.0	4.4	3.9	4.0	3.9	3.8	5.0	4.4	3.9	4.0	3.9	3.7
Vegetables, fruit, nuts	15.0	12.0	11.8	11.9	11.8	11.8	34.2	22.4	22.1	22.2	22.1	22.0	46.2	30.8	30.5	30.6	30.5	30.4	37.5	26.1	25.9	25.9	25.9	25.8	43.4	27.5	27.4	27.4	27.4	27.3
Wheat	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2
Wool, silk-worm cocoons	5.0	10.5	10.0	10.2	10.0	9.9	5.0	8.4	7.9	8.0	7.9	7.8	5.8	6.7	6.0	6.2	6.0	5.9	5.3	10.3	9.7	9.8	9.7	9.6	5.1	6.0	5.5	5.6	5.5	5.4

Importer	TUN																											
Average of Value	Exporter																											
			CaiDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							30.0	22.0	22.0	22.0	22.0	22.0							30.0	22.0	22.0	22.0	22.0	22.0	30.0	22.8	22.8	22.8	22.8	22.8
Cattle,sheep,goats,horses	10.3	7.4	7.4	7.4	7.4	7.4	12.2	8.0	8.0	8.0	8.0	8.0	45.0	21.6	21.6	21.6	21.6	21.6	11.8	8.2	8.2	8.2	8.2	8.2	21.3	10.9	10.7	10.7	10.7	10.6
Forestry	20.5	5.0	5.0	5.0	5.0	5.0	19.8	5.1	5.0	5.0	5.0	5.0	17.9	10.6	10.0	10.1	10.0	9.8	18.6	6.5	6.3	6.3	6.3	6.2	20.7	6.6	6.5	6.5	6.5	6.5
Fishing	49.3	28.1	28.1	28.1	28.1	28.1	33.1	21.7	21.7	21.7	21.7	21.7	14.4	16.8	16.7	16.7	16.7	16.7	23.6	18.8	18.8	18.8	18.8	18.8	33.4	22.4	22.3	22.4	22.4	22.3
Cereal grains nec	9.6	6.0	6.0	6.0	6.0	6.0	9.0	5.9	5.9	5.9	5.9	5.9	6.8	4.2	4.2	4.2	4.2	4.2	5.3	5.3	5.3	5.3	5.3	5.3	5.1	5.7	5.7	5.7	5.7	5.7
Animal products nec	26.5	8.8	8.7	8.7	8.7	8.7	30.4	14.7	14.5	14.6	14.5	14.5	29.6	16.9	14.2	14.7	14.7	14.2	22.7	17.0	16.6	16.7	16.7	16.6	27.9	9.0	8.9	8.9	8.9	8.9
Crops nec	27.8	14.3	14.0	14.0	14.0	13.9	33.1	15.9	15.6	15.7	15.6	15.5	12.6	7.4	7.2	7.2	7.2	7.1	41.2	28.3	27.6	27.8	27.7	27.5	45.9	18.6	18.4	18.4	18.4	18.4
Oil seeds	5.7	5.7	5.2	5.3	5.2	5.1	8.0	5.9	5.6	5.7	5.6	5.5	24.0	11.6	11.6	11.6	11.6	11.6	11.6	4.7	4.7	4.7	4.7	4.7	10.0	3.8	3.8	3.8	3.8	3.8
Paddy rice	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5	20.0	14.2	12.1	12.6	12.1	11.5
Plant-based fibers	5.0	4.4	3.9	4.0	3.9	3.7	5.0	4.4	3.9	4.0	3.9	3.7	5.0	4.4	3.9	4.0	3.9	3.8	5.0	4.4	3.9	4.0	3.9	3.8	5.0	4.4	3.9	4.0	3.9	3.7
Vegetables, fruit, nuts	15.0	12.0	11.8	11.9	11.8	11.8	34.2	22.4	22.1	22.2	22.1	22.0	46.2	30.8	30.5	30.6	30.5	30.4	37.5	26.1	25.9	25.9	25.9	25.8	43.4	27.5	27.4	27.4	27.4	27.3
Wheat	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2	5.0	3.2	3.2	3.2	3.2	3.2
Wool, silk-worm cocoons	5.0	10.5	10.0	10.2	10.0	9.9	5.0	8.4	7.9	8.0	7.9	7.8	5.8	6.7	6.0	6.2	6.0	5.9	5.3	10.3	9.7	9.8	9.7	9.6	5.1	6.0	5.5	5.6	5.5	5.4

Importer	RSADAC																											
Average of Value	Exporter																											
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							120.0	13.6	13.6	13.6	13.6	13.6							147.6	5.0	5.0	5.0	5.0	5.0	117.4	10.9	10.9	10.9	10.9	10.9
Cattle,sheep,goats,horses	122.7	1.5	1.5	1.5	1.5	1.5	121.9	1.9	1.9	1.9	1.9	1.9	148.1	1.5	1.5	1.5	1.5	1.5	136.9	6.8	6.8	6.8	6.8	6.8	123.0	2.9	2.9	2.9	2.9	2.9
Forestry	110.8	4.0	4.0	4.0	4.0	4.0	111.7	3.9	3.9	3.9	3.9	3.9	105.6	2.7	2.7	2.7	2.7	2.7	124.7	3.7	3.7	3.7	3.7	3.7	119.0	12.7	12.7	12.7	12.7	12.7
Fishing	89.8	9.2	9.2	9.2	9.2	9.2	104.8	13.1	13.1	13.1	13.1	13.1	140.6	5.6	5.6	5.6	5.6	5.6	38.8	11.9	11.9	11.9	11.9	11.9	42.7	12.0	12.0	12.0	12.0	12.0
Cereal grains nec	119.3	2.5	2.5	2.5	2.5	2.5	118.3	4.4	4.4	4.4	4.4	4.4	144.0	6.3	6.3	6.3	6.3	6.3	102.2	7.5	7.5	7.5	7.5	7.5	93.6	6.1	6.1	6.1	6.1	6.1
Animal products nec	129.5	3.6	3.6	3.6	3.6	3.6	123.1	8.7	8.7	8.7	8.7	8.7	140.1	0.8	0.8	0.8	0.8	0.8	129.9	12.8	12.8	12.8	12.8	12.8	124.6	6.7	6.7	6.7	6.7	6.7
Crops nec	128.2	22.2	22.2	22.2	22.2	22.2	120.9	20.0	19.9	19.9	19.9	19.9	137.5	3.8	3.8	3.8	3.8	3.8	122.6	25.3	25.2	25.3	25.2	25.2	121.7	16.4	16.4	16.4	16.4	16.4
Oil seeds	136.8	2.9	2.9	2.9	2.9	2.9	142.6	4.3	4.3	4.3	4.3	4.3	123.5	3.0	3.0	3.0	3.0	3.0	129.8	1.9	1.9	1.9	1.9	1.9	123.7	2.1	2.1	2.1	2.1	2.1
Paddy rice	149.3	6.0	6.0	6.0	6.0	6.0	125.8	10.4	10.4	10.4	10.4	10.4	118.7	5.4	5.4	5.4	5.4	5.4	131.2	6.0	6.0	6.0	6.0	6.0	134.0	10.0	10.0	10.0	10.0	10.0
Plant-based fibers	7.0	1.2	1.0	1.0	1.0	0.9	48.4	0.9	0.8	0.8	0.8	0.8	29.2	0.7	0.6	0.6	0.6	0.6	27.6	1.4	1.2	1.2	1.2	1.1	54.5	1.2	1.0	1.0	1.0	0.9
Vegetables, fruit, nuts	136.6	15.9	15.9	15.9	15.9	15.9	117.6	13.8	13.8	13.8	13.8	13.8	122.8	14.9	14.9	14.9	14.9	14.9	125.4	15.0	15.0	15.0	15.0	15.0	118.9	11.7	11.7	11.7	11.7	11.7
Wheat	86.7	4.6	4.6	4.6	4.6	4.6	89.3	4.8	4.8	4.8	4.8	4.8	89.4	3.9	3.9	3.9	3.9	3.9	93.9	4.1	4.1	4.1	4.1	4.1	85.2	5.1	5.1	5.1	5.1	5.1
Wool, silk-worm cocoons	147.3	1.2	1.2	1.2	1.2	1.2	146.7	2.7	2.7	2.7	2.7	2.7	141.1	0.7	0.7	0.7	0.7	0.7	136.0	2.4	2.4	2.4	2.4	2.4	127.8	1.5	1.5	1.5	1.5	1.5

Importer	RSCU																											
Average of Value	Exporter																											
			CairDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							26.0	20.0	19.5	20.0	20.0	19.5							30.2	20.0	19.5	20.0	20.0	19.5	26.0	20.0	19.5	20.0	20.0	19.5
Cattle,sheep,goats,horses	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	10.7	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Forestry	5.2	0.5	0.5	0.5	0.5	0.5	3.3	0.5	0.5	0.5	0.5	0.5	9.2	0.4	0.4	0.4	0.4	0.4	12.0	0.3	0.3	0.3	0.3	0.3	7.4	2.6	2.6	2.6	2.6	2.6
Fishing	18.8	1.6	1.6	1.6	1.6	1.6	26.9	4.7	4.7	4.7	4.7	4.7	21.9	2.2	2.2	2.2	2.2	2.2	31.7	13.1	13.1	13.1	13.1	13.1	20.8	3.2	3.2	3.2	3.2	3.2
Cereal grains nec	41.5	2.6	2.6	2.6	2.6	2.6	40.9	3.0	3.0	3.0	3.0	3.0	47.3	4.8	4.8	4.8	4.8	4.8	38.7	21.8	21.8	21.8	21.8	21.8	37.5	20.2	20.2	20.2	20.2	20.2
Animal products nec	2.6	0.4	0.4	0.4	0.4	0.4	5.2	0.3	0.3	0.3	0.3	0.3	41.0	0.3	0.3	0.3	0.3	0.2	13.9	0.8	0.8	0.8	0.8	0.8	3.7	0.1	0.1	0.1	0.1	0.1
Crops nec	25.6	5.9	5.6	5.7	5.6	5.6	26.3	6.6	6.6	6.6	6.6	6.6	14.5	0.8	0.8	0.8	0.8	0.8	59.6	10.5	10.5	10.5	10.5	10.5	29.4	8.9	8.8	8.8	8.8	8.8
Oil seeds	45.6	8.9	8.9	8.9	8.9	8.9	59.0	8.8	8.8	8.8	8.8	8.8	39.7	1.5	1.5	1.5	1.5	1.5	41.7	1.1	1.1	1.1	1.1	1.1	40.3	0.9	0.9	0.9	0.9	0.9
Paddy rice	7.8	0.0	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0	24.4	0.0	0.0	0.0	0.0	0.0
Plant-based fibers	66.2	13.2	13.2	13.2	13.2	13.2	59.4	13.0	13.0	13.0	13.0	13.0	58.5	12.7	12.7	12.7	12.7	12.7	58.6	14.1	14.1	14.1	14.1	14.1	49.3	13.2	13.2	13.2	13.2	13.2
Vegetables, fruit, nuts	50.6	6.6	6.4	6.5	6.4	6.4	27.2	5.0	4.8	4.9	4.8	4.7	29.9	7.5	7.2	7.3	7.2	7.2	29.2	11.8	11.5	11.6	11.5	11.4	18.6	5.5	5.1	5.2	5.1	4.9
Wheat	46.9	21.4	21.4	21.4	21.4	21.4	63.6	31.8	31.8	31.8	31.8	31.8	69.7	37.0	37.0	37.0	37.0	37.0	66.8	36.8	36.8	36.8	36.8	36.8	55.0	28.7	28.7	28.7	28.7	28.7
Wool, silk-worm cocoons	3.7	0.0	0.0	0.0	0.0	0.0	14.9	1.9	1.5	1.6	1.5	1.4	13.2	0.6	0.5	0.5	0.5	0.5	9.0	0.3	0.3	0.3	0.3	0.3	6.3	3.5	2.8	3.0	2.8	2.6

Importer	RSSAHAF																											
Average of Value	Exporter																											
			CaiDd						EU25						Japan						ReG20						USA			
Sectors	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4	Base	Bound	Sim1	Sim2	Sim3	Sim4
Sugar cane, sugar beet							106.3	10.4	10.4	10.4	10.4	10.4							58.8	8.0	8.0	8.0	8.0	8.0	114.0	10.9	10.9	10.9	10.9	10.9
Cattle,sheep,goats,horses	63.6	19.0	19.0	19.0	19.0	19.0	85.5	15.1	15.1	15.1	15.1	15.1	57.0	9.5	9.5	9.5	9.5	9.5	62.2	10.3	10.3	10.3	10.3	10.3	68.6	8.8	8.8	8.8	8.8	8.8
Forestry	34.6	10.8	10.8	10.8	10.8	10.8	71.3	10.8	10.8	10.8	10.8	10.8	47.7	9.8	9.8	9.8	9.8	9.8	59.3	9.2	9.2	9.2	9.2	9.2	83.9	12.0	12.0	12.0	12.0	12.0
Fishing	63.9	17.8	17.8	17.8	17.8	17.8	59.4	12.7	12.7	12.7	12.7	12.7	48.0	11.4	11.4	11.4	11.4	11.4	36.5	15.1	15.1	15.1	15.1	15.1	38.6	16.5	16.5	16.5	16.5	16.5
Cereal grains nec	81.0	11.7	11.7	11.7	11.7	11.7	98.4	27.4	27.3	27.3	27.3	27.3	49.9	3.9	3.9	3.9	3.9	3.9	94.9	27.1	27.0	27.0	27.0	27.0	101.7	28.8	28.7	28.7	28.7	28.7
Animal products nec	62.2	10.1	10.1	10.1	10.1	10.1	95.1	19.6	19.6	19.6	19.6	19.6	59.9	9.7	9.7	9.7	9.7	9.7	76.1	17.1	17.0	17.1	17.0	17.0	71.6	11.8	11.8	11.8	11.8	11.8
Crops nec	65.8	8.9	8.8	8.8	8.8	8.8	94.5	12.3	12.3	12.3	12.3	12.3	59.4	4.5	4.5	4.5	4.5	4.5	80.8	15.0	14.9	14.9	14.9	14.9	93.8	11.6	11.6	11.6	11.6	11.6
Oil seeds	59.8	4.4	4.4	4.4	4.4	4.4	61.1	4.9	4.9	4.9	4.9	4.9	58.8	7.4	7.4	7.4	7.4	7.4	68.1	8.4	8.4	8.4	8.4	8.4	68.9	8.8	8.8	8.8	8.8	8.8
Paddy rice	61.3	11.7	11.7	11.7	11.7	11.7	93.9	26.0	26.0	26.0	26.0	26.0	108.5	30.8	30.8	30.8	30.8	30.8	81.3	19.3	19.3	19.3	19.3	19.3	71.2	14.0	14.0	14.0	14.0	14.0
Plant-based fibers	58.9	6.2	6.2	6.2	6.2	6.2	64.2	6.5	6.5	6.5	6.5	6.5	58.6	6.4	6.4	6.4	6.4	6.4	58.9	6.2	6.2	6.2	6.2	6.2	58.9	6.2	6.2	6.2	6.2	6.2
Vegetables, fruit, nuts	66.5	21.9	21.6	21.7	21.6	21.5	92.1	37.2	37.1	37.1	37.1	37.1	88.7	35.2	35.1	35.1	35.1	35.0	72.0	25.7	25.5	25.6	25.5	25.4	86.6	34.5	34.3	34.3	34.3	34.2
Wheat	105.7	8.6	8.6	8.6	8.6	8.6	105.1	9.1	9.1	9.1	9.1	9.1	105.2	9.3	9.3	9.3	9.3	9.3	96.7	8.8	8.8	8.8	8.8	8.8	110.4	9.4	9.4	9.4	9.4	9.4
Wool, silk-worm cocoons	59.7	8.5	8.5	8.5	8.5	8.5	58.7	8.5	8.5	8.5	8.5	8.5	59.0	7.9	7.9	7.9	7.9	7.9	58.7	8.4	8.4	8.4	8.4	8.4	58.8	8.5	8.5	8.5	8.5	8.5

Annex 3

Concordance for the MIRAGE Model with GTAP 6.0

Regions

	MIRAGE	GTAP 6.0
1	EUR25	Austria, Belgium, Denmark, Finland, France, Germany, United Kingdom, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, Cyprus, Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia, Estonia, Latvia, Lithuania.
2	USA	The United States
3	Japan	Japan
3	Developed Cairns Group POE (CairDd)	Australia, New Zeland, Canada
4	Tunisia	Tunisia
5	Morocco	Morocco
6	Rest of North Africa	Algeria, Libya, Egypt
7	South Africa	South Africa
8	Rest of SADAC	Botswana, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Rest of SADAC
9	Rest of SACU	Rest of South African Customs Union
10	Rest of sub-Saharan Africa (RSSAHAF)	Madagascar, Uganda, Rest of sub-Saharan Africa
11	ReG20	China, Indonesia, Malaysia, Philippines, Thailand, India, Argentina, Brazil, Chile, Uruguay, Rest of South America, Central America, Venezuela
12	Rest of the World	Rest of Oceania, Hong Kong, Korea, Taiwan, Rest of East Asia, Singapore, Vietnam, Rest of Southeast Asia, Bangladesh, Sri Lanka, Rest of South Asia, Mexico, Rest of North America, Colombia, Peru, Rest of Andean Pact, Rest of FTAA, Rest of Europe, Albania, Bulgaria, Croatia, Romania, Russian Federation, Rest of Former Soviet Union, Turkey, Rest of Middle East

Sectors

	MIRAGE	GTAP 6.0
1	PDR	Paddy Rice
2	WHT	Wheat
3	GRO	Cereals grains nec
4	V_F	Vegetables, fruits, nuts
5	OSD	Oil seeds
6	C_B	Sugar cane, sugar beet
7	PFB	Plant-Based Fibers
8	OCR	Crops nec
9	CTL	Cattle, sheep, goats, horses
10	OAP	Animal Products nec
11	RMK	Raw milk
12	WOL	Wool, silk, worm cocoons
13	FRS	Forestry
14	FSH	Fishing
15	AgroInd	Meat, cattle sheep, goats, horse; Meat products nec; Vegetable oils and fats; Dairy products; Processed rice; Sugar; Food products nec; Beverages and tobacco products.
16	TexVet	Textiles, Wearing apparel
17	IndBasTe	Leather products; Wood products; Paper products, publishing
18	IndMovTe	Petroleum and coal products; Chemical, rubber, plastic prods; Mineral products nec; Ferrous metals; Metals nec; Metal products; Manufacture nec.
19	IndLourd	Motor vehicles and parts, transport equipment nec, Electronic equipment, Machinery and equipment nec.
20	Services	Electricity, Gas manufacture and distribution, Water, Construction, Communication, Financial services nec, Insurance, Business services nec, Recreation and other services, Public administration/defense/health/education, Dwellings
21	Trt	Transport nec, Sea transport, Air Transport

Annex 4: Detailed simulation results (global model)

Table 1: Variation of the GDP (in volume)

Year	2007				2010				2015			
Region	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***
North African countries												
Tunisia	0.20	0.10	0.18	0.20	1.18	0.46	1.05	1.19	1.32	0.28	1.11	1.34
Morocco	0.01	0.00	0.02	0.01	0.06	0.01	0.12	0.06	-0.29	-0.38	-0.24	-0.29
Rest of North Africa	0.00	-0.01	0.00	0.00	0.03	-0.01	0.00	0.03	-0.22	-0.28	-0.25	-0.22
Sub-Saharan Countries												
South Africa	0.05	0.03	0.05	0.05	0.20	0.09	0.16	0.20	-0.02	-0.15	-0.07	-0.02
Rest of SACU	0.04	0.03	0.00	0.04	0.22	0.09	0.00	0.22	-0.08	-0.27	-0.38	-0.08
Rest of SADAC countries	0.12	0.03	0.00	0.12	0.58	0.11	0.00	0.58	0.70	0.07	-0.06	0.70
Rest of sub-Saharan Africa	0.05	0.04	0.03	0.05	0.16	0.11	0.09	0.16	-0.33	-0.39	-0.42	-0.32
Rest of developing countries												
Non African G20 countries	0.06	0.03	0.03	0.06	0.23	0.10	0.12	0.23	0.21	0.06	0.09	0.22
Rest of developing countries	0.02	0.01	0.01	0.02	0.09	0.03	0.04	0.09	-0.06	-0.13	-0.12	-0.06
Developed regions												
European Union	0.02	0.00	0.00	0.02	0.08	0.01	0.02	0.08	0.06	-0.03	-0.01	0.06
USA	0.01	-0.02	-0.01	0.01	0.12	0.00	0.06	0.12	0.18	0.02	0.09	0.18
Japan	0.06	0.03	0.04	0.06	0.21	0.10	0.14	0.21	0.31	0.15	0.21	0.31
CAIRNS developed countries	0.20	0.08	0.10	0.20	0.77	0.22	0.30	0.77	1.03	0.33	0.44	1.03
Rest of developed countries	0.06	0.02	0.03	0.06	0.20	0.06	0.10	0.20	0.19	0.03	0.07	0.20

Note: Relative Variation according to the baseline scenario

Source: Authors simulation using the MIRAGE mode and MacMap data base for Market access

Table 2: Welfare impacts

Year	2007				2010				2015			
Region	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***
North African countries												
Tunisia	12,15	5,29	11,13	12,28	113,17	44,04	100,11	113,73	168,35	15,06	136,76	169,38
Morocco	-6,37	-6,87	-4,28	-6,37	-12,98	-16,04	-3,74	-12,98	-105,38	-113,47	-93,15	-105,39
Rest of North Africa	-35,71	-36,13	-36,24	-35,59	-65,60	-76,99	-73,67	-65,18	-320,79	-360,16	-345,51	-320,38
Sub-Saharan Countries												
South Africa	27,17	15,51	24,72	27,22	113,56	52,38	92,98	113,81	228,72	125,40	181,95	229,25
Rest of SACU	8,02	7,00	4,70	8,02	45,17	28,12	14,67	45,18	37,78	-16,64	-43,95	37,77
Rest of SADAC countries	5,66	1,11	-0,47	5,66	36,90	6,16	-1,56	36,92	75,88	16,53	3,57	75,92
Rest of sub-Saharan Africa	17,30	14,01	12,46	17,73	78,18	57,82	49,90	79,94	-201,24	-240,28	-255,76	-198,33
Rest of developing countries												
Non African G20 countries	242,65	18,40	54,30	245,07	1719,52	453,76	639,12	1728,51	2984,19	630,94	969,81	2996,62
Rest of developing countries	-71,88	-144,30	-135,18	-70,86	284,23	-165,04	-93,27	289,48	-1539,44	-2461,29	-2299,00	-1525,84
Developed regions												
European Union	-13,11	-428,58	-349,57	-12,12	1525,29	79,32	383,56	1530,55	9425,73	7596,45	8059,47	9441,00
USA	561,46	517,58	555,04	561,99	1575,19	1307,31	1562,92	1578,56	2559,58	1873,76	2477,50	2568,44
Japan	764,98	-131,81	94,84	765,13	3539,50	262,19	1045,47	3540,41	2468,24	-587,00	-4,43	2470,11
CAIRNS developed countries	327,54	98,77	147,11	328,32	1663,41	453,92	712,36	1667,39	2803,85	871,52	1313,47	2813,20
Rest of developed countries	10,09	-151,60	-81,84	11,06	251,67	-333,00	-69,12	254,12	-727,46	-1250,29	-994,40	-727,47

Note: Absolute variation according to the baseline scenario

Source: Authors simulation using the MIRAGE mode and MacMap data base for Market access

Table 3: Trade balance impacts

Year	2007				2010				2015			
Region	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***	***sim1***	***sim2***	***sim3***	***sim4***
North African countries												
Tunisia	2,21	1,75	2,56	2,23	13,99	7,87	14,94	14,07	28,00	15,33	28,35	28,18
Morocco	-1,38	-1,79	-0,12	-1,38	-4,59	-6,06	2,35	-4,61	-10,07	-14,19	0,86	-10,13
Rest of North Africa	-14,28	-13,76	-13,32	-14,25	-37,19	-33,78	-32,45	-37,06	-68,35	-59,84	-60,94	-68,18
Sub-Saharan Countries												
South Africa	-26,35	-25,10	-25,31	-26,34	-62,40	-60,92	-57,61	-62,35	-104,35	-137,13	-109,33	-104,23
Rest of SACU	1,35	1,97	1,13	1,35	4,83	6,95	2,50	4,85	8,28	9,64	2,28	8,31
Rest of SADAC countries	3,19	0,83	0,25	3,19	19,87	4,38	1,34	19,87	38,07	7,23	1,81	38,07
Rest of sub-Saharan Africa	10,59	7,89	6,78	10,68	34,88	21,63	15,78	35,29	36,62	10,75	0,78	37,45
Rest of developing countries												
Non African G20 countries	68,72	-58,37	-33,79	69,84	368,72	-137,50	-52,84	375,18	272,85	-256,12	-185,59	288,90
Rest of developing countries	-73,36	-59,79	-69,25	-73,36	-149,47	-84,11	-130,65	-149,59	-77,44	26,31	-54,49	-77,80
Developed regions												
European Union	426,21	471,36	473,53	425,25	1321,96	1735,67	1679,89	1317,64	1020,73	2171,41	1842,36	1010,67
USA	703,69	692,73	686,34	704,00	153,90	-21,34	42,66	155,20	-706,71	-1009,84	-699,35	-704,83
Japan	-194,77	-206,31	-189,70	-195,11	-145,52	-202,42	-147,91	-147,58	82,10	13,98	59,87	76,61
CAIRNS developed countries	-503,64	-477,41	-489,90	-503,94	-578,87	-627,82	-640,18	-579,43	416,10	-344,97	-239,89	417,75
Rest of developed countries	-402,20	-333,99	-349,18	-402,16	-940,11	-602,54	-697,82	-941,46	-935,82	-432,56	-586,71	-940,78

Note: Absolute variation according to the baseline scenario

Source: Authors simulation using the MIRAGE mode and MacMap data base for Market access

Table 4: Sectoral world price variation

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	-1,52	-1,33	-1,36	-1,52	-2,52	-1,69	-1,84	-2,53	-2,16	-1,25	-1,47	-2,18
Wheat	0,42	0,26	0,31	0,42	1,68	1,05	1,25	1,69	2,56	1,91	2,14	2,56
Cereal grains nec	0,31	0,25	0,28	0,31	1,39	1,13	1,26	1,39	3,81	3,55	3,64	3,81
Vegetables. fruit. nuts	0,19	0,18	0,21	0,19	0,66	0,61	0,70	0,66	1,26	1,18	1,26	1,26
Oil seeds	-0,58	-0,63	-0,62	-0,58	-0,07	-0,30	-0,24	-0,07	0,69	0,41	0,48	0,68
Sugar cane. sugar beet	0,20	0,17	0,17	0,20	0,62	0,48	0,50	0,62	0,93	0,79	0,81	0,93
Plant-based fibers	0,20	0,16	0,17	0,20	0,75	0,57	0,61	0,75	1,54	1,29	1,35	1,54
Crops nec	0,24	0,22	0,23	0,24	0,80	0,69	0,71	0,80	1,21	1,08	1,09	1,21
Cattle.sheep.goats.horses	0,90	0,86	0,87	0,90	2,76	2,57	2,60	2,76	4,64	4,53	4,49	4,65
Animal products nec	0,49	0,48	0,48	0,49	1,27	1,22	1,25	1,27	1,82	1,80	1,81	1,82
Raw milk	0,27	0,25	0,26	0,27	0,85	0,78	0,79	0,85	2,56	2,48	2,50	2,56
Wool. silk-worm cocoons	0,24	0,17	0,19	0,24	0,77	0,42	0,51	0,77	1,19	0,69	0,82	1,19
Forestry	0,00	-0,03	-0,02	0,00	0,19	0,04	0,07	0,19	0,44	0,26	0,29	0,44
Fishing	-0,07	-0,08	-0,08	-0,07	-0,04	-0,11	-0,10	-0,04	0,09	0,00	0,01	0,09
Industrial Sectors												
AgroInd	0,17	0,16	0,16	0,17	0,48	0,43	0,43	0,48	1,84	1,81	1,81	1,84
TexVet	0,06	0,03	0,04	0,06	0,22	0,10	0,12	0,21	0,45	0,29	0,32	0,45
IndBasTe	0,04	0,01	0,02	0,04	0,18	0,05	0,08	0,18	0,32	0,16	0,20	0,32
IndMoyTe	0,02	0,00	0,00	0,02	0,10	0,01	0,03	0,10	0,22	0,10	0,12	0,22
IndLourd	0,01	-0,01	-0,01	0,01	0,07	-0,01	0,01	0,07	0,19	0,08	0,10	0,19
ResNat	0,03	0,01	0,01	0,03	0,16	0,04	0,07	0,16	0,36	0,19	0,23	0,36

Table 5: Sectoral value added for North African countries

MOR

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	-1,36	0,00	0,75	-1,36	-9,28	-1,18	2,27	-9,28	-13,33	-0,94	2,87	-13,32
Wheat	0,52	0,52	0,48	0,52	1,83	1,76	1,64	1,84	4,61	4,58	4,43	4,61
Cereal grains nec	0,13	0,18	0,16	0,13	0,23	0,46	0,36	0,23	2,08	2,38	2,25	2,08
Vegetables. fruit. nuts	0,27	0,01	0,32	0,27	1,10	-0,01	1,39	1,10	1,44	-0,10	1,83	1,44
Oil seeds	1,57	1,60	1,56	1,57	3,44	3,56	3,39	3,45	4,74	4,91	4,69	4,76
Sugar cane. sugar beet	-0,23	-0,12	-0,17	-0,23	-0,97	-0,44	-0,67	-0,97	-0,25	0,50	0,17	-0,25
Plant-based fibers	0,20	0,22	0,19	0,20	0,38	0,46	0,35	0,38	0,52	0,61	0,50	0,52
Crops nec	0,44	0,49	0,44	0,44	1,22	1,44	1,22	1,21	0,52	0,98	0,58	0,49
Cattle.sheep.goats.horses	-0,01	0,00	0,00	-0,01	-0,03	0,03	0,03	-0,03	0,15	0,21	0,23	0,16
Animal products nec	-0,05	-0,02	-0,04	-0,05	-0,20	-0,06	-0,12	-0,20	-0,18	0,00	-0,06	-0,18
Raw milk	-0,11	-0,04	-0,06	-0,11	-0,46	-0,12	-0,24	-0,46	0,37	0,82	0,68	0,37
Wool. silk-worm cocoons	-0,04	-0,03	-0,06	-0,04	-0,10	-0,08	-0,22	-0,10	-0,50	-0,50	-0,68	-0,50
Forestry	0,00	0,02	-0,01	0,00	0,07	0,12	0,00	0,07	-0,09	-0,03	-0,17	-0,08
Fishing	0,05	0,08	0,06	0,05	0,15	0,28	0,20	0,15	-0,07	0,11	0,02	-0,06
Industrial Sectors												
AgroInd	-0,29	-0,14	-0,18	-0,29	-1,14	-0,49	-0,67	-1,14	0,22	1,06	0,82	0,22
TexVet	-0,04	-0,04	-0,08	-0,04	-0,07	-0,09	-0,26	-0,07	-0,71	-0,76	-0,98	-0,71
IndBasTe	-0,06	-0,05	-0,08	-0,06	-0,19	-0,15	-0,24	-0,19	-0,64	-0,59	-0,69	-0,64
IndMoyTe	-0,06	-0,05	-0,07	-0,06	-0,18	-0,14	-0,23	-0,18	-0,49	-0,43	-0,54	-0,49
IndLourd	-0,11	-0,09	-0,12	-0,11	-0,34	-0,25	-0,41	-0,34	-0,95	-0,82	-1,03	-0,95
ResNat	-0,05	-0,05	-0,07	-0,05	-0,14	-0,15	-0,30	-0,15	-0,65	-0,71	-0,95	-0,65

RNA

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	0,34	0,47	0,39	0,30	0,23	0,99	0,53	0,05	0,75	1,47	0,66	0,27
Wheat	0,50	0,41	0,44	0,50	1,72	1,30	1,45	1,73	3,31	2,81	3,00	3,31
Cereal grains nec	0,45	0,43	0,45	0,45	1,14	1,05	1,13	1,14	2,26	2,13	2,23	2,25
Vegetables. fruit. nuts	0,04	0,02	0,04	0,04	0,16	0,10	0,17	0,16	0,49	0,40	0,49	0,49
Oil seeds	1,61	1,58	1,59	1,61	3,99	3,78	3,88	3,99	5,98	5,59	5,79	5,97
Sugar cane. sugar beet	0,01	0,00	0,00	0,01	0,11	0,03	0,05	0,10	1,60	1,47	1,50	1,58
Plant-based fibers	0,56	0,57	0,56	0,56	1,30	1,36	1,32	1,30	1,70	1,74	1,70	1,70
Crops nec	0,22	0,27	0,24	0,21	0,61	0,83	0,65	0,55	0,62	0,97	0,66	0,48
Cattle.sheep.goats.horses	0,05	0,02	0,03	0,05	0,25	0,09	0,17	0,24	1,02	0,81	0,91	1,02
Animal products nec	0,01	0,01	0,01	0,01	0,08	0,05	0,06	0,08	0,64	0,58	0,60	0,64
Raw milk	0,03	0,01	0,02	0,02	0,14	0,08	0,09	0,14	1,24	1,14	1,16	1,23
Wool. silk-worm cocoons	0,07	0,05	0,06	0,07	0,27	0,14	0,21	0,27	0,18	-0,06	0,06	0,19
Forestry	0,00	0,01	0,01	0,00	0,06	0,10	0,08	0,06	0,03	0,07	0,05	0,03
Fishing	-0,02	-0,02	-0,02	-0,02	-0,02	-0,03	-0,03	-0,03	0,02	0,00	0,01	0,02
Industrial Sectors												
AgroInd	0,00	-0,02	-0,02	0,00	0,09	-0,02	0,00	0,08	2,01	1,85	1,88	1,99
TexVet	-0,07	-0,06	-0,07	-0,07	-0,23	-0,17	-0,21	-0,23	-0,78	-0,69	-0,75	-0,77
IndBasTe	-0,04	-0,03	-0,04	-0,04	-0,11	-0,08	-0,10	-0,11	-0,28	-0,24	-0,26	-0,28
IndMoyTe	-0,06	-0,05	-0,05	-0,06	-0,21	-0,14	-0,17	-0,21	-0,51	-0,42	-0,45	-0,51
IndLourd	-0,11	-0,08	-0,09	-0,11	-0,38	-0,24	-0,29	-0,37	-0,93	-0,74	-0,81	-0,92
ResNat	-0,02	-0,02	-0,02	-0,02	-0,10	-0,07	-0,09	-0,10	-0,33	-0,29	-0,32	-0,33

TUN

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	-0,51	0,55	0,69	-0,49	-4,16	0,03	0,13	-4,09	-2,78	1,43	2,16	-2,66
Wheat	-1,79	-1,61	-1,78	-1,79	-9,75	-8,23	-9,62	-9,73	-16,43	-14,08	-15,94	-16,39
Cereal grains nec	0,35	0,35	0,38	0,35	-0,62	-0,14	-0,38	-0,61	4,93	5,64	5,37	4,95
Vegetables. fruit. nuts	0,04	0,01	0,07	0,04	0,46	-0,06	0,51	0,46	1,38	0,02	1,30	1,37
Oil seeds	1,56	1,31	1,49	1,55	6,21	3,97	5,72	6,19	12,34	6,98	11,23	12,30
Sugar cane. sugar beet	1,31	0,57	1,20	1,31	9,62	3,14	8,49	9,58	18,06	5,74	15,76	17,99
Plant-based fibers	-0,15	-0,01	-0,16	-0,15	-1,42	-0,18	-1,31	-1,41	-2,69	-0,65	-2,44	-2,68
Crops nec	0,34	0,49	0,34	0,34	0,25	1,51	0,41	0,25	0,55	2,53	0,90	0,56
Cattle.sheep.goats.horses	1,40	0,65	1,28	1,39	9,88	3,43	8,75	9,84	18,33	6,14	16,06	18,27
Animal products nec	0,79	0,33	0,72	0,78	5,81	1,73	5,10	5,76	11,07	3,12	9,61	10,97
Raw milk	1,00	0,47	0,92	0,99	6,79	2,35	6,01	6,77	11,96	4,00	10,46	11,92
Wool. silk-worm cocoons	-0,09	0,08	-0,11	-0,09	-1,65	0,07	-1,52	-1,63	-3,25	0,01	-2,87	-3,23
Forestry	-0,09	0,13	-0,07	-0,08	-1,35	0,46	-1,08	-1,31	-2,17	0,93	-1,65	-2,07
Fishing	0,12	0,07	0,12	0,12	1,05	0,40	0,96	1,05	2,31	0,72	2,04	2,30
Industrial Sectors												
AgroInd	1,61	0,70	1,48	1,60	11,39	3,72	10,06	11,35	20,07	6,40	17,52	20,00
TexVet	-0,13	-0,03	-0,13	-0,13	-1,18	-0,20	-1,08	-1,17	-2,25	-0,16	-1,98	-2,24
IndBasTe	-0,12	-0,04	-0,11	-0,12	-1,00	-0,24	-0,87	-0,99	-1,93	-0,41	-1,63	-1,92
IndMoyTe	-0,16	-0,06	-0,15	-0,15	-1,16	-0,29	-1,02	-1,15	-1,97	-0,38	-1,69	-1,96
IndLourd	-0,36	-0,15	-0,33	-0,36	-2,45	-0,70	-2,14	-2,44	-4,59	-1,46	-3,99	-4,57
ResNat	-0,09	-0,03	-0,08	-0,09	-0,80	-0,20	-0,72	-0,80	-1,72	-0,30	-1,50	-1,71

Table 6: Sectoral value added for Sub-Saharan countries

RSADAC

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	0,10	0,11	0,07	0,10	0,60	0,35	0,13	0,60	2,05	1,29	0,91	2,05
Wheat	0,69	0,41	0,45	0,69	2,85	1,40	1,49	2,85	5,60	3,42	3,37	5,61
Cereal grains nec	0,06	0,03	0,02	0,06	0,36	0,13	0,10	0,36	0,83	0,40	0,32	0,83
Vegetables. fruit. nuts	0,00	0,01	0,06	0,00	-0,04	0,03	0,21	-0,04	-0,08	0,02	0,19	-0,08
Oil seeds	0,67	0,66	0,65	0,67	1,52	1,44	1,39	1,52	2,16	2,00	1,91	2,16
Sugar cane. sugar beet	0,12	0,07	0,01	0,12	0,82	0,34	0,03	0,82	2,11	1,08	0,58	2,11
Plant-based fibers	0,70	0,73	0,78	0,70	1,30	1,59	1,84	1,30	1,40	1,99	2,38	1,41
Crops nec	0,44	0,42	0,39	0,44	1,35	1,27	1,15	1,35	1,95	1,81	1,58	1,94
Cattle.sheep.goats.horses	0,11	0,05	0,00	0,11	0,84	0,30	0,01	0,84	2,18	1,05	0,57	2,18
Animal products nec	0,04	0,03	0,01	0,04	0,31	0,17	0,03	0,31	0,86	0,48	0,24	0,86
Raw milk	0,06	0,03	-0,01	0,07	0,55	0,21	0,00	0,55	1,55	0,80	0,44	1,55
Wool. silk-worm cocoons	0,03	0,01	-0,01	0,03	0,28	0,09	-0,01	0,29	0,79	0,35	0,18	0,80
Forestry	-0,08	-0,07	-0,06	-0,08	-0,22	-0,14	-0,11	-0,22	-0,32	-0,23	-0,19	-0,32
Fishing	0,02	0,00	-0,01	0,02	0,21	0,07	-0,02	0,21	0,55	0,23	0,08	0,55
Industrial Sectors												
AgroInd	0,19	0,09	0,00	0,19	1,35	0,51	0,00	1,35	3,42	1,70	0,91	3,42
TexVet	-0,18	-0,15	-0,12	-0,18	-0,70	-0,45	-0,27	-0,70	-1,18	-0,66	-0,38	-1,18
IndBasTe	-0,11	-0,09	-0,07	-0,11	-0,45	-0,29	-0,16	-0,45	0,01	0,30	0,46	0,01
IndMoyTe	-0,15	-0,11	-0,09	-0,15	-0,71	-0,41	-0,28	-0,71	-1,40	-0,82	-0,62	-1,40
IndLourd	-0,22	-0,17	-0,14	-0,22	-1,02	-0,61	-0,41	-1,02	-2,32	-1,50	-1,18	-2,32
ResNat	-0,06	-0,05	-0,04	-0,06	-0,36	-0,21	-0,11	-0,36	-0,88	-0,51	-0,29	-0,88

RSCU

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	0,40	0,55	0,59	0,40	0,00	0,88	1,14	0,01	-0,26	1,17	1,63	-0,25
Wheat	1,24	0,77	0,74	1,24	6,36	3,04	2,76	6,37	14,09	7,29	6,49	14,10
Cereal grains nec	0,32	0,13	0,10	0,32	1,76	0,50	0,28	1,76	3,34	0,97	0,52	3,34
Vegetables. fruit. nuts	0,25	0,11	0,43	0,25	0,98	0,37	1,83	0,98	1,74	0,71	2,56	1,73
Oil seeds	0,90	0,61	0,54	0,90	3,68	1,65	1,24	3,68	6,59	2,59	1,85	6,60
Sugar cane. sugar beet	1,12	0,31	0,09	1,12	6,61	1,45	0,30	6,61	11,82	2,86	1,04	11,82
Plant-based fibers	-0,01	0,16	0,20	-0,01	-0,76	0,29	0,54	-0,77	-2,10	-0,31	0,10	-2,11
Crops nec	0,39	0,22	0,17	0,39	2,06	0,81	0,50	2,06	4,16	1,51	0,94	4,16

Cattle.sheep.goats.horses	0,81	0,25	0,13	0,81	4,80	1,15	0,45	4,80	9,09	2,39	1,16	9,09
Animal products nec	0,50	0,23	0,15	0,50	2,91	0,95	0,51	2,91	5,71	1,77	0,98	5,72
Raw milk	0,92	0,26	0,08	0,92	5,48	1,23	0,27	5,48	9,98	2,47	0,93	9,98
Wool. silk-worm cocoons	0,30	0,14	0,08	0,30	1,74	0,55	0,25	1,74	3,58	1,28	0,78	3,58
Forestry	-0,15	-0,03	-0,01	-0,15	-0,77	-0,11	0,00	-0,77	-1,50	-0,54	-0,37	-1,50
Fishing	0,43	0,21	0,15	0,43	2,52	0,87	0,48	2,52	5,08	1,64	0,91	5,08
Industrial Sectors												
AgroInd	1,33	0,36	0,09	1,33	7,45	1,61	0,30	7,45	12,59	3,02	1,08	12,59
TexVet	-0,24	-0,04	0,02	-0,24	-1,49	-0,19	0,12	-1,49	-3,90	-1,69	-1,20	-3,90
IndBasTe	-0,21	-0,04	0,02	-0,21	-1,30	-0,20	0,10	-1,30	-3,70	-1,89	-1,42	-3,70
IndMoyTe	-0,51	-0,17	-0,10	-0,51	-2,62	-0,66	-0,34	-2,62	-3,96	-0,90	-0,43	-3,96
IndLourd	-0,31	-0,09	-0,03	-0,31	-1,74	-0,38	-0,08	-1,75	-2,54	-0,28	0,17	-2,54
ResNat	-0,17	-0,04	-0,01	-0,17	-1,28	-0,26	-0,04	-1,28	-4,16	-1,93	-1,49	-4,17

RSSAHAF

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	-0,09	-0,04	-0,04	-0,10	-0,41	-0,11	-0,14	-0,42	0,81	1,19	1,14	0,79
Wheat	1,26	0,99	1,12	1,26	4,53	3,34	3,97	4,54	9,67	8,35	9,18	9,67
Cereal grains nec	-0,01	0,00	0,00	-0,01	-0,06	0,01	-0,01	-0,06	0,13	0,24	0,20	0,13
Vegetables. fruit. nuts	0,41	-0,05	-0,03	0,41	1,91	-0,14	-0,06	1,91	2,61	-0,32	-0,24	2,61
Oil seeds	2,20	2,25	2,24	2,20	5,22	5,45	5,44	5,22	7,91	8,28	8,26	7,91
Sugar cane. sugar beet	-0,07	-0,04	-0,05	-0,08	-0,26	-0,08	-0,12	-0,27	0,68	0,92	0,87	0,66
Plant-based fibers	1,25	1,27	1,30	1,25	2,77	2,83	2,99	2,79	3,18	3,22	3,46	3,21
Crops nec	0,31	0,45	0,40	0,32	0,81	1,41	1,19	0,82	0,91	1,80	1,46	0,92
Cattle.sheep.goats.horses	-0,03	-0,01	-0,02	-0,03	-0,10	-0,02	-0,04	-0,10	0,19	0,30	0,26	0,18
Animal products nec	-0,04	-0,01	-0,02	-0,05	-0,17	0,00	-0,04	-0,18	0,01	0,27	0,20	0,00
Raw milk	-0,02	-0,01	-0,02	-0,03	-0,06	-0,02	-0,02	-0,06	-0,05	0,02	0,01	-0,05
Wool. silk-worm cocoons	-0,05	-0,04	-0,03	-0,05	-0,11	-0,09	-0,03	-0,12	0,26	0,24	0,36	0,25
Forestry	-0,05	-0,04	-0,03	-0,05	-0,06	-0,04	-0,02	-0,06	-0,19	-0,19	-0,16	-0,19
Fishing	-0,02	0,00	-0,01	-0,02	-0,06	0,02	0,00	-0,06	0,38	0,49	0,46	0,37
Industrial Sectors												
AgroInd	-0,07	-0,03	-0,04	-0,08	-0,27	-0,05	-0,12	-0,29	1,08	1,40	1,31	1,06
TexVet	-0,14	-0,15	-0,13	-0,14	-0,34	-0,41	-0,32	-0,34	-0,79	-0,91	-0,76	-0,78
IndBasTe	-0,13	-0,12	-0,11	-0,13	-0,39	-0,36	-0,32	-0,38	-0,78	-0,74	-0,68	-0,78
IndMoyTe	-0,11	-0,11	-0,10	-0,11	-0,35	-0,32	-0,29	-0,35	-0,85	-0,80	-0,76	-0,84
IndLourd	-0,24	-0,22	-0,21	-0,24	-0,84	-0,74	-0,69	-0,83	-2,02	-1,86	-1,78	-2,02
ResNat	-0,06	-0,06	-0,05	-0,06	-0,19	-0,20	-0,17	-0,18	-0,52	-0,59	-0,53	-0,52

SAF

	2007				2010				2015			
	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4	sim1	sim2	sim3	sim4
Agricultural sectors												
Paddy rice	1,201	1,18	1,087	1,201	3,1	2,841	2,393	3,102	5,627	4,844	4,154	5,632
Wheat	1,039	0,291	0,279	1,039	6,343	0,983	0,946	6,344	14,29	2,693	2,686	14,29
Cereal grains nec	0,489	0,401	0,584	0,489	1,76	1,314	2,24	1,76	3,615	2,864	4,282	3,617
Vegetables. fruit. nuts	0,521	0,201	0,719	0,522	2,252	0,739	3,348	2,256	4,273	1,712	6,032	4,283
Oil seeds	2,299	2,045	1,982	2,299	7,863	5,832	5,533	7,864	15,16	10,53	10,11	15,16
Sugar cane. sugar beet	0,231	0,103	0,119	0,231	1,174	0,46	0,565	1,176	2,725	1,513	1,749	2,728
Plant-based fibers	0,469	0,523	0,456	0,471	1,311	1,536	1,236	1,319	2,993	3,259	2,843	3,015
Crops nec	0,324	0,332	0,285	0,325	1,21	1,165	0,964	1,213	2,81	2,575	2,333	2,819
Cattle.sheep.goats.horses	0,241	0,106	0,116	0,242	1,205	0,461	0,541	1,206	2,663	1,449	1,655	2,666
Animal products nec	0,154	0,111	0,104	0,155	0,698	0,411	0,405	0,701	1,545	1,007	1,057	1,553
Raw milk	0,183	0,085	0,1	0,183	0,906	0,367	0,461	0,907	2,077	1,168	1,368	2,079
Wool. silk-worm cocoons	0,218	0,24	0,184	0,219	0,891	0,857	0,642	0,898	3,268	2,926	2,683	3,293
Forestry	-0,02	-0,01	-0,03	-0,02	-0,04	0,018	-0,06	-0,04	-0,64	-0,62	-0,71	-0,64
Fishing	0,091	0,062	0,062	0,091	0,575	0,326	0,351	0,575	1,517	0,949	1,04	1,519
Industrial Sectors												
AgroInd	0,307	0,133	0,169	0,307	1,463	0,561	0,745	1,465	3,163	1,746	2,08	3,168
TexVet	-0,03	-0	-0,02	-0,03	-0,14	8E-04	-0,09	-0,14	-2,57	-2,41	-2,53	-2,57
IndBasTe	-0,05	-0,03	-0,04	-0,05	-0,16	-0,06	-0,14	-0,16	-2,31	-2,22	-2,32	-2,32
IndMoyTe	-0,09	-0,05	-0,07	-0,09	-0,35	-0,15	-0,25	-0,35	-0,35	-0,07	-0,21	-0,36
IndLourd	-0,13	-0,07	-0,1	-0,13	-0,52	-0,23	-0,36	-0,52	-0,09	0,364	0,169	-0,09
ResNat	-0,06	-0,03	-0,04	-0,06	-0,22	-0,08	-0,15	-0,22	-1,28	-1,06	-1,16	-1,28