WTO-Doha Multilateral Trade Negotiations and Agriculture

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The Doha Development Round or Doha Development Agenda (DDA) is the current trade-negotiation round of the World Trade Organization (WTO), which launched in November 2001. With the start of this round, non-trade concerns (NTCs) were explicitly renowned and integrated into the negotiation process. Generally, multi-functionality proponents attempt to resist agricultural trade liberalization by giving high support to protect their domestic producers. These are net food importing countries, some small countries with highly protected agricultural sector and large trade deficits in some main outputs and unfavourable agro-climatic conditions. The opponents of the multi-functionality argument all claim to recognize the legitimacy of other countries' non-trade concerns. However, they insist that NTCs should be safeguarded by measures that are not trade distorting. Thus, they challenge countries with significant NTCs to devise green box measures for protecting them. This paper analyses the debate surrounding multi-functionality in the context of the WTO Millennium Round negotiations on agricultural trade liberalization. Six points of contention are discussed in detail. The paper also considers whether the concept of multi-functionality contributes to the framework for the negotiations. Also, the paper sheds light on the case of Sudan in regard with multi-functionality of agriculture and the case of Sudan.
1. ABSTRACT

The Doha Development Round or Doha Development Agenda (DDA) is the current trade-negotiation round of the World Trade Organization (WTO), which launched in November 2001. With the start of this round, non-trade concerns (NTCs) were explicitly renowned and integrated into the negotiation process. Generally, multi-functionality proponents attempt to resist agricultural trade liberalization by giving high support to protect their domestic producers. These are net food importing countries, some small countries with highly protected agricultural sector and large trade deficits in some main outputs and unfavourable agro-climatic conditions. The opponents of the multi-functionality argument all claim to recognize the legitimacy of other countries' non-trade concerns. However, they insist that NTCs should be safeguarded by measures that are not trade distorting. Thus, they challenge countries with significant NTCs to devise green box measures for protecting them. This paper analyses the debate surrounding multi-functionality in the context of the WTO.
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2. INTRODUCTION

Multi-functionality of agriculture is a major economic aspect of almost all whether developed, developing or least developed countries. It pinpoints how this subject affects negotiations in the area of agricultural trade liberalization. Multi-functionality, also, explains why agriculture negotiations in the arena of multilateral negotiations are as contentious as we will see later. The rest of the paper is planned to shed light on selected issues of the World Trade Organization (WTO) Agreement on Agriculture (AoA), trade policy landscape that are useful in understanding the results of the simulations. However, in depth of the AoA, an exploration is presented of the three pillars manipulated in the negotiations of agriculture and the preference erosion in the Doha Round. The Doha Round differs from earlier trade negotiations prior to the establishment of the WTO, in two main respects: first, this round and its forerunner, the UR starting in 1995, are the first to address trade in agricultural commodities. Previous trade negotiations under the GATT excluded the agriculture sector. As a result, worldwide agricultural trade remains greatly distorted through market protection, high levels of export subsidies and domestic support of agriculture production. The existence of many bilateral and regional trading preferences has distorting impacts on trade. Second, Doha Round sets more weight on the role of global trade in the promotion of economic development and poverty alleviation, leading to its description as a development agenda. The Doha Development Agenda (DDA) of multilateral trade negotiations under the WTO was initiated during the Fourth WTO Ministerial Conference at Doha, Qatar in November 2001. The Doha negotiations incorporated the ongoing negotiations already on agriculture and services. These two were the only areas where negotiations on further trade liberalization had been mandated in the UR-WTO Agreements. The DDA drew attention to agriculture and market access. Indeed, during the WTO Ministerial Meeting in Doha, Ministers agreed to —Substantial improvement in market access, reduction of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic supportl. The Uruguay Round Agreement on Agriculture imposed implementation costs on developing as well as LDC countries and negotiating developing countries gave themselves a loophole in determining the appropriate reference period from which to measure reductions of agricultural tariffs, export subsidy and domestic support. Negotiations under the DDA are expected to tackle these limitations of the URAA. The Doha Declaration suggested guidelines for agricultural negotiations in this Round of MTNs. It specified that this Round should aim to obtain substantial improvement of market access, reduction of all export subsidies, in view of their progressive withdrawal, and substantial reduction of domestic support having effects on trade distortion (Achterbosch et al., 2004). The three concerned matters of trade reform in the agriculture negotiations under the DDA are market access (reductions in tariffs and tariff rate quotas); export competition (the promotion of agricultural exports through subsidies and export credits) and domestic support (commitments to reduce trade-distorting farm income policies).

3. POST-Doha WTO MULTILATERAL NEGOTIATIONS

The period of March 2002-July 2003 is the phase of preparations for _modalities_. This phase deals with one of the most critical stages of the agriculture negotiations. It aims to
set—modalities or targets (including numerical targets) for achieving the objectives set out in the Doha Ministerial Declaration: substantial improvements in market access; reductions of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic support. It will also include some rule making. This stage will therefore determine the shape of the negotiations final outcome. The modalities will be used for members to produce their first offers or comprehensive draft commitments. The Doha Ministerial Declaration said this had to be done by the Fifth Ministerial Conference in Cancun, Mexico, 10-14 September 2003, a few months after the 31 March 2003 deadline for modalities. As it turned out, members failed to meet the March 2003 deadline for agreeing—modalities and then turned their attention to an outline or—framework of the modalities, which was eventually agreed on 1 August 2004. The periods involved can therefore be described as: preparations for modalities (March 2002-July 2003), Cancun and the framework phase (2003-2004), and the modalities phase (September 2004) (WTO, 2004).

4. The Cancun: September 2003

At the WTO Ministerial conference in Cancun, 10-14 September 2003, it is concluded, Notwithstanding this setback, we reaffirm all our Doha Declarations and Decisions and recommit ourselves to working to implement them fully and faithfully (WTO, 2003). Therefore, the WTO overall objective is that the agricultural trade is to be rule based transparent global trade to improve welfare and overall competitiveness with special reference to developing countries as had been mentioned in the DDA of 2001. The July 2004 Package: Ten months later, the Cancun deadlock was broken. On 1 August 2004, the WTO’s 147 member governments approved a package of agreements that includes an outline (or framework) to be used to complete the —modalities on agriculture. Although agriculture was not the immediate cause of the Cancun deadlock, major differences in agriculture remained barely below the surface. Resolving many of these was the key to the July 2004 breakthrough on all subjects in the Doha Development Agenda.

5. Preference Erosion in the Doha Round

Non-reciprocal trade preferences have been long granted by developed countries to various developing countries. In the post-World War II, the pattern of these preferences reflected the past colonial trade ties. In 1968, the United Nations Conference on Trade and Development (UNCTAD) recommended the creation of a Generalized System of Preferences' (GSP) under which industrialized countries would grant trade preferences to all developing countries on a non-reciprocal basis (Hoekman and Prowse, 2005). Preferences are a crucial device of the present protection patterns, for many countries. The poorest countries benefit from preferential access to many countries through the least developed countries—Generalized System of Preferences, and in particular to the EU, thanks to the Cotonou agreement between the European Union (EU) and the African, Caribbean and Pacific (ACP) countries, Everything But Arms (EBA) initiative (adopted in March 2001), and special arrangements for subsets of developing countries such as the US African Growth and Opportunity Act (AGOA), the US Caribbean Basin Initiative, etc. Trade negotiations that reduce standard developed countries tariff rates wear away the effective size of these preferences, and the competitive advantages they provide (preference erosion). This could happen even if the preferences were left untouched. In this context, any multilateral liberalization involves an erosion of the preference margin. The stiffer competition this implies for least developed countries exports might lead to reduced exports (at least exports to the EU), as a consequence of a multilateral liberalization of market access. The negotiations in the Doha Round search to reduce or
eliminate most favored nation (MFN) tariffs and non-tariff barriers. Additional goals are even deeper cuts on tariff peaks and ensuring that the product coverage is comprehensive and without a priori exclusions. These goals create problems for developing countries with preferential access since their most valuable preferences are precisely in sectors where the MFN tariffs are high. The preference erosion in the Doha Round raised two opposing principles to the forefront: (1) members have been encouraged to provide special and differential treatment (SDT) for developing countries by granting preferences through the GSP and other comparable programs, (2) the first Article of the GATT preserves equal treatment for all members with the obligation of MFN. The result is that exports from many developing countries now entering developed countries at zero or reduced rates and such preferences present some difficulties when further MFN liberalization is considered. Preferential market access conditions provided by Commodity Protocols to ACP countries are being eroded as a result of dispute settlement cases at the WTO, reform of the Common Agricultural Policy (CAP), tariff liberalization (MFN-WTO and regional-bilateral agreements by the EU), and other issues that affect the benefits of preferences (rules of origin, standards, etc. That facilitate trade creation and are not expensive to implement). The policy literature has tended to rely on descriptive indicators to assess the impact of preferences. Four indicators are particularly common: (1) Preference margins: the difference between MFN and preferential tariffs for products, (2) Potential coverage: the ratio between products covered by a scheme and the dutiable imports originating in beneficiary countries, (3) Utilization: the ratio between imports that actually receive preferential treatment and those that are in principle covered, and (4) Utility: the ratio of the value of imports that get preferences to all dutiable imports from that exporter (the lower this number, the less generous the preference scheme). Such indicators provide at best a partial perspective of the economic value of preferences (Hoekman, 2005). Many countries have benefited from preferential access and have graduated from bilateral programs, and others continue to benefit. But many of the poorest countries have not managed to use preferences to diversify and expand exports (Hoekman and Prowse, 2005). Policy implications of preferences can only have an impact if there is a non-zero tariff in the importing market. Most of the Sudan export items may face zero MFN tariffs. Raising trade barriers in order to raise the value of preferential access would be globally welfare reducing, although it is sometimes suggested. More common is the argument used by vested interests in the OECD that preferred developing countries should not lose any more preferential access to their (highly distorted) markets.

6. MECHANICS OF PREFERENCE EROSION

As Hoekman and Prowse, 2005, it is helpful to start with a brief discussion of the basic mechanics of preferences and preference erosion. Figure 1 represents an archetype OECD country importing varieties of good X from two suppliers, an LDC (S_LDC) and a non-LDC (S_non-LDC). Trade preferences imply a reduction in the tariff applied to imports from the LDC. This increases LDC exports from \( X_{LDC,0} \) to \( X_{LDC,1} \), with associated benefits for the LDC exporter represented by area A. There is also a concomitant shift in demand away from imports from the non-preferential supplier, resulting in loss in exporter surplus equal to area B (Figure 1). The magnitude of the costs and benefits depend on supply and demand responsiveness to price changes, as well as the degree of substitution between preferential and non-preferential suppliers. The impact on the country granting the preferences depends on a mix of effects - terms of trade, trade creation, and trade diversion. On net, trade preferences therefore involve a mix of benefits for preferential exporters, costs imposed on third-country exporters, and potential losses for the importer as well. Only if the (more) preferred country (countries) is (are) small in the sense of not at all affecting the internal price in the
importing nation will there be no detrimental effect on third country competitors. If so, the preference only creates trade (expands imports), to the detriment of local suppliers in the preference granting country, but not to other foreign suppliers, as they continue to confront the same price. Starting from the form of preferences in the top half of Figure 1, the elimination of preferences (because of MFN reforms or unilateral liberalization in the importing country) involves the reversal of the process. The importer recovers tariff revenue, and potentially realizes terms of trade gains. Import demand shifts back to the non-preferential supplier, who recovers the exporter surplus B. The preferential supplier loses the exporter surplus gains represented by area A. Preference erosion is a similar process, but one involving the elimination of tariffs on the non-preferential supplier. This is shown in the bottom half of Figure 1. Elimination of the tariff on remaining third-country suppliers, given the duty free access already for preferential suppliers, means that third-country exporters see their exports increase from \( X_{\text{non-LDC},1} \) to \( X_{\text{non-LDC},2} \). There is a gain in exporter surplus of area E, which may be greater or less than the original loss of exporter surplus resulting from the preferences, area B in the top part of Figure 1. The preferential supplier experiences a fall in demand for its exports from \( D_{\text{LDC},1} \) to \( D_{\text{LDC},2} \). This results in a partial, though generally not full, loss of the benefits from the original preference scheme. This is represented by area C, which is shown as being less than area A in the top half of Figure 1. The reason the loss is not complete is that preferences include, in part, the benefits relative to the original tariff-ridden equilibrium from a non-discriminatory tariff reduction by the importer. Preference erosion therefore generally yields a partial, not full, loss of the original benefits of the preference scheme. At the same time, third-countries recover some of the costs originally imposed by the preference scheme.

Figure 1: The mechanics of preference erosion

7. **MULTI-FUNCTIONALITY OF AGRICULTURE**

Multi-functionality of agriculture refers to the concept that, besides producing food and fiber, agriculture creates non-food joint or spillover—multifunctional—benefits such as food security, open space, wildlife habitat, biodiversity, flood prevention, viable rural communities and cultural heritage. The term multi-functionality used with various meanings in the agricultural policy debate, depending on the country and on the context in which it has arisen. While the basic concept appears uncontroversial, multi-functionality has become the subject of dispute in international forums because some countries seek to use multi-functionality to justify exemptions from WTO commitments to reduce their governments' production-related support/subsidy to agriculture. The multifunction approach identifies the different economic, environmental and social functions of agriculture. In the broad sense, multi-functionality attempts to increase the value of the different types of agricultural outputs. Figure 2 summarizes the key elements and functions of multi-functionality of agriculture. There are two key elements of multi-functionality: the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture; and the fact that some of the non-commodity outputs exhibit the characteristics of externalities or public goods, with the result that markets for these goods do not exist or function poorly (OECD, 2001). Multi-functionality of agriculture has become a topical issue in domestic policy circles and at the WTO, although the concept is subject to widely differing interpretations. Nevertheless, it is commonly accepted that agriculture is multifunctional when it has one or several roles or functions in addition to its primary role of producing food and fiber. These additional functions may include long-term food security, rural area viability, cultural heritage, land conservation, agricultural landscape, agri-biological diversity, as well as good plant, animal and public health. These different functions often have public good characteristics, are specific to agriculture, and are to a large extent provided as joint products of the agricultural activity itself (Cretegny, 2002). This concept of multi-functionality is becoming the foundation for a European model of agriculture as a whole (Béranger, 2000).

Arguments for multi-functionality can be made clearer by examining the economic issues that underlie the arguments for production-linked support. Multi-functionality has three major characters. First, integration, where some countries have argued that production of food and non-food outputs is closely linked in terms of the economic principle of —joint products. Joint products, or integration, characterize a production relationship where two (or more) outputs are produced from the same production process. For example, hides and meat are joint products of cattle. Second, the externalities and market Failure: agricultural production activities can have positive (and negative) side effects, or externalities, that may not be accounted for in the market. For example, a positive externality of agricultural production might be flood protection, while the harmful effects of agricultural runoff on water quality would constitute a negative externality. In the multi-functionality debate, the existence of positive externalities frequently cited as justification for government intervention in agriculture. Similarly, some countries contend that some of these non-food outputs, such as cultural heritage and scenic vistas, are public goods that require government support to ensure their supply. Third, efficient policy design, where efficient policies target the specific objective associated with the non-food output, and are less likely to result in trade distortions. Production-linked policies that target the non-food objective indirectly are more likely to have spillovers that distort production and trade. The principle of efficient policy design—that policies should be targeted to the objective—is inconsistent with the integration rationale for production-linked support (Normile, 2001). The most important point in this context is how to enhance positive externalities, while curbing negative ones. Accepting the concept and respecting the value of multi-functionality, require three prerequisites: agriculture
should be ecologically sustainable, should be economically viable and should be evaluated correctly. Until now, in Sudan as well as in many developing countries, agriculture has been weighed up only by the value of food, i.e. by market price of agricultural product. However, considering the multi-functions of agriculture, its value is underestimated. In economics, multi-functions are termed external effects of economic activities.

8. AGRICULTURE AND THE GLOBAL TRADE

The concept of multifunctional agriculture has risen to prominence as a term of art in trade negotiations. The concept originated - at least in part - as an attempt to buttress up national efforts to preserve policies that support farmers and rural communities against attacks under international trade agreements. This situation has progressed to the point that certain non-commodity benefits of agriculture are acknowledged in trade bodies, but there remains considerable friction over these policies (DeVries, 2000). Therefore, we can say that agriculture as a source of food and its role in welfare whether in developed or developing countries, is among the thorniest topics of present-day trade negotiations. The concept of multi-functionality enfolds two views: (1) So-called Non-economic Objectives (SNOs), which refers to agricultural policies to address a number of targets, of which the living standards of farmers is only one. Winters (1990) used SNOs of agricultural support to describe the goals other than farm incomes that support policies in developed countries, which include landscape preservation, maintenance of rural society, ensuring food security and environmental protection, (2) Non-Trade Concerns (NTCs): in the second half of 1990s, during the millennium round trade negotiations within the WTO, the above objectives appeared at the top of the list in the category of non-trade concerns. NTCs relating to agriculture can be defined as domestic policy goals that countries perceive as threatened by further liberalization of agricultural trade. Therefore, to characterize agriculture as multifunctional is to acknowledge the following features: (1) marketable outputs: production of food and fiber, which contribute directly to promote farmers income and standard of living, (2) non-marketable outputs: (i) societal objectives (ii) environmental objectives. The developed countries that promote the idea of agriculture as a multifunctional activity argue that the provision of these non-food outputs will suffer if agricultural supports are reduced by further trade liberalization. Proponents to multi-functionality are net food importing countries (e.g. Rep. of Korea and Japan) that give high support to protect their domestic rice producers. Others are those small countries with highly protected agricultural sector, large trade deficits in some main outputs and unfavourable agro-climatic conditions (e.g. Norway and Switzerland). The opponents of the multi-functionality argument all claim to recognize the legitimacy of other countries' non-trade concerns. However, they insist that NTCs should be safeguarded by measures that are not trade distorting. Thus, they challenge countries with significant NTCs to devise green box measures for protecting them (Burrel, 2002). The EU has argued that some subsidies are needed to provide the optimal amount of non-commodity outputs produced by agriculture. The idea is that agriculture is multifunctional and externalities such as rural development and landscape would be under-produced, while some forms of pollution (such as nitrogen runoff) would be overproduced without government intervention (Peplow, Rausser and Simon 2005; Hanisch, 2006). Since then others consider Multi-functionality as an alibi concept for some people and as a powerful idea to truly integrate rural development strategies. Those who voted against Europe's well protected agricultural sector in the WTO belong to the first category. Those who believe in rural exceptionality, with respect to the production of goods and services of particular complexity, belong to the other (Rodriguez 2004:1; Hanisch, 2006).
9. **MULTI-FUNCTIONALITY AND THE CASE OF SUDAN**

Many issues were discussed in the WTO-Agreement on Agriculture and they are relatively correlated to the main components of multi-functionality. These issues are of vital importance and it is necessary to discuss them from the point of view that whether agriculture deserves special consideration under the WTO rules. The components of multi-functionality are, Food Security which covers the concept of a country being able to guarantee the availability and access to sufficient nutritional food for its population. Apart from this requiring sufficient income for the population to pay for the goods, it requires there to be sufficient supply. This can occur through domestic production or imports. Food security has three scopes as set by WFP (2005): 1) Food availability: food of sufficient quantity and quality must be accessible in the right place and at the right time. Elements of food availability is determined by the domestic production capacity, import capacity and food aid, 2) Food access: reflects the entitlement of households and individuals to the resources required for producing and/or acquiring appropriate foods. Entitlements are determined by income, access to productive resources, as well as formal and informal social safety nets, 3) food stability: reflects variability in the availability and access to food over time. The stability dimension initially focused on aspects such as weather variability and price fluctuations. More recently, however aspects relating environmental risks and political stability are also being considered, particularly in protracted crises. A fourth dimension is food utilization that incorporates aspects such as adequate diet, clean water, sanitation, and health care, which highlights the importance of non-food aspects for food security. It is particularly relevant for integrated food and nutrition security frameworks.

The argument of the multi-function protagonists is that this needs to happen through self-sufficiency, as imports are less secure than domestic production. Hence, subsidies are needed to encourage domestic production. The counter-argument covers several fronts. On the consumer side, prices for agricultural products are higher with subsidies (in the form of import restrictions, domestic and export subsidies). In addition, insulation from the world market by many countries increases the volatility of world prices and quantities supplied. Wynen (2002) cited that several aspects of food security, price level and quantity stability, are served better by an open economy, with multiple trading partners, than an economy that attempts self-sufficiency. Safeguarding against hunger in a situation of war is unlikely to be effective in those cases where starvation is an objective of the occupying force. During the last quarter of the twentieth century, some parts of Sudan were hit by food insecurity represented by dramatic famines in years of 1982, 1992 and 1998. Food shortages were filled through food aid. In general, diverse factors affecting food security in the Sudan at different stages. There are factors affecting production (expansion of arable land, increase in cropping intensity, availability of inputs, etc.), yield (depends on the availability and quality of resources), harvest and post-harvest processes. Factors can be summarized as: (1) volatility of climatic conditions, (2) war in some parts of the south and unrest in Darfur, (3) mass displacement of the population from areas of war to the main cities and towns, (4) poor maintenance of the scarce infrastructure, (5) failure of governmental institutions to provide the essential required services; (5) non-availability of cold storages; (6) inappropriate handlings for grains, fruits and vegetables across the country.

Environmental Protection also is connected with agriculture, trade and environment are interrelated and the issue of agriculture became an essential factor in trade agreements by the end of the Uruguay Round of GATT negotiations. Agriculture is and will continue to be a major contributor to environmental degradation, inducing the conversion of natural ecosystems to agricultural production as the sector responds to increased demand for food and fibers due to increases in population and wealth. Agricultural goods also comprise an important segment
of international commodities trade and there can be important environmental effects, both positive and negative, from increased agricultural trade. In addition, domestic environmental regulations can significantly affect an industry’s competitiveness. Thus, it is important to explore the implications for agriculture and the environment of international trade agreements (Colyer 2003). Environmental issues became important in free trade agreements after the U.S. loss in the 1991 dispute with Mexico over tuna fishing and protection of dolphins (Eglin, 1999; Colyer, 2003). The relationship between agricultural practices and environment got unbalanced due to certain factors like agricultural exploitation of natural resources, which led to serious environmental degradation. The dimensions of the problem when it took place differed from place to place and from one country to another. The impact of agriculture can be positive in terms of agricultural production, landscapes and habitat conservation and may be negative in the sense of degradation of natural resources and as a source of pollution. Domestic changes in agricultural production, and consequently landscapes, can happen through a number of changes, such as a change in agricultural protection policies and a change in world prices. Within the WTO context, the argument to protect the environment whatever the decision about the basis is then translated into the right of a country to subsidize farmers for the protection of those landscapes, even when it distorts world production. Farmers need to be subsidized at present production levels for the landscape to be visible to tourists (Wynen, 2002). To shed light on the environmental situation of Sudan, any agricultural activities must upset the natural ecological units. The magnitude to which the natural imbalances depends on the ecosystems, intensity and the duration of the activity. Adverse impacts of agriculture on environment include: (1) land/soil degradation (continuous cultivation of the same piece of land, deforestation to clear more/change land for crop production, overgrazing). (2) pollution of water, land and air (chemicals are used to control plant and animal pests and diseases have adverse effects on other flora and fauna useful to human beings, some chemicals when applied to field crops and animals persist in the crop and livestock products thus posing human health risks. In order to elaborate description of the observed damage to the environment as a result of agricultural activities and practices. Agricultural activities affect, in one way or another, the natural ecological units. The magnitude of the natural imbalances depends on the natural surroundings, intensity and the duration of the agricultural activities. Adverse impacts of agriculture on environment comprise, first, land/soil degradation that includes: continuous cultivation of the same piece of land, deforestation to clear more land for crops reproduction, overgrazing. Second, pollution of water, land and air that includes using chemical compounds in the area of controlling animal and plant pests have that results in adverse effects on other fauna and flora useful to man, most of the pesticides when applied to crops or animals have residual effect in plants/products and animal/products thus subjecting human to health risks. Third, agriculture irrigation systems will have different effects on the environment by the fact that flood irrigation wash and sweeps chemicals used in agriculture down to surface water. Such exercise poses some risks on human and animals. Also, flood irrigation in its self is a system that uses more than enough water for irrigation, which results in loss of water by drainage or runoff. Thus the following points require nothing as major causes of the observed damage to the environment: Ignorance and lack of awareness among the population of the adverse consequences of their actions on the environment, most people are entirely dependent on agriculture. They neither have the means nor the capacity for a viable alternative, lack of a comprehensive national policy on environment management, lack of a comprehensive enabling umbrella legislation on environment management, inadequate and weak institutional framework on environment management, environment management is dispersed in several Government and Non-Governmental Organizations, lack of appropriate information on natural resources to enable sound planning and management, lack of trained
and committed personnel in environmental management (Sekitoleko, 1993).

10. Viability of Rural Areas

Agriculture is the dominant sector in rural economies in developing countries. It is still the key sector in managing the land, and many industries are dependent on agriculture. Both agricultural and rural policies are changing to respond to society's concerns regarding food safety, food security, animal welfare, environmental protection and the viability of rural areas. Earlier, there were contradictory views between agricultural economists and ecologists. Agricultural economists emphasize on the significance of maintaining and improving living standards of farmers by increasing output per unit, where the ecologists focus on conservation and maintenance of the natural resources. However, nowadays, the plans of both are to protect the nature and to balance the ecological unity of rural areas as equivalent to boost farmers' revenue. Therefore, the viability of rural areas, especially in developing countries, is inseparable from agricultural production and the opposite in developed countries. According to Bearden et al., (undated), they developed rural viability score (RVS) using a three step process: the control group, the survey, and the baseline. RVS for each of the control group communities was calculated by applying the regression equation as follows: RVS = (Intercept) + (Slope Coefficient)(Raw Score).

Like development, poverty is multidimensional, which complements money-based measures by considering multiple deprivations and their overlap (UNDP, 2010). As in many parts of the world, The Sudan is increasingly divided, with rural and urban residents competing for the limited resources of the government. It is evident that there is a strong relationship between poverty and rural viability. Poverty in Sudan is attributed to many factors like inadequate development strategies, climatic unpredictability and erosion of natural resources. In Sudan, agriculture contributes close to 40 per cent of its gross domestic product (GDP). An overwhelming proportion of the nearly two-thirds of the Sudanese who live in rural areas depend on agriculture for their livelihood. Seventy per cent of the labor force is principally employed in agricultural activities. In the foreseeable future the welfare of Sudan’s population, especially of the poor who are largely located in rural areas, will to a substantial degree depend on the performance of the agricultural sector (Khan, 2004). From an economic growth point of view, Abbadi and Ahmed (2006) concluded that despite high growth rates of the Sudan economy during the past years, the level of poverty has dramatically increased. This could be explained by a high positive correlation between growth rates in GDP and agricultural GDP. On analyzing agricultural GDP, during period 2000-2004, the contribution of the traditional rain-fed sub-sector amounts to 15.9%, irrigated sub-sector 27.6% and the semi-mechanized sub-sector 3.7%. The proportions of the population depending on those sub-sectors are 70%, 12% and 0.7% consecutively. The contribution of traditional rain-fed sub-sector to agricultural GDP falls short relative to the proportion of population depending on it. This pattern is a reflection of skewed income distribution among different subsectors which calls for a number of measures to be undertaken to enhance productivity of unit labor and other resources (land, water, and other inputs).

11. Conclusion and Recommendations

For a long term rural economic strategy (RES), the Sudan agricultural policy makers may recommend for a long term economic viability of the rural area, with an emphasis on local farming, through recognizing the strengths, weaknesses, opportunities, constraints, and the role of the agricultural sectors (irrigated agriculture, mechanized rain-fed cultivation, traditional rain-fed farming and livestock). Also, it is vital to identify the importance of
home-based businesses for individuals and families living in the rural area. Furthermore, to encourage value activities that support the rural economy to locate in existing rural towns and villages. Considering the rural traditions and habits to ensure the goals, policies, and implementation strategies, which should be compatible with the standard of living and character found in the targeted areas of Sudan. Finally, it is important to encourage recreation and tourism opportunities suitable to each area.

Food security is one of the most bulbous problems faced by the Sudan government. At the national level, areas under unreliable and uncertain food security status have severe impacts on population in the form of under nutrition, malnutrition, hunger and possible starvation. To ensure food security, the government may adopt sound strategic production plans. Adoption of new agricultural technologies should be adopted in the availability of capital or national financing institutions. While adoption of new agricultural technologies is a lengthy process and it is not easily transferable, Sudan have to adapt these technologies from the developed companies to suit its factor endowments and natural conditions taking into consideration the severity of this process where the agricultural sector important for the economy. Additionally, supporting farmers by developing marketing channels and information system. The government, also, have to promote and offer various facilities for the development of rural industries, services and infrastructure. In regard to environmental protection, it is recommended to develop a correlated relationship between agriculture and environment protection.

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