

A study of institutional environment and household food security at local level in Rwanda

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Abstract:

The study looked into the current scenario of food security in Rwanda. After analysing the national level institutional and food security scenarios by using available secondary data, the researchers used primary data that have been collected from a random sample of 200 households spreading over six sectors of the Huye district by using structured interview schedule, as well using a case study of a rice cooperative in Huye district. Focus group discussions with all stakeholders concerned with food security at local level enriched the data that we collected by other means. The general conclusion that emerges from the study is that in order to attain the food security at local level in Rwanda lot more to be done. Among other things, strengthening existing local institutions like farmer cooperatives, improving agricultural production technology, diversifying household income sources for better access, and genuine integration of food security concerns in the district development plans.

The researchers come out with certain policy recommendations that may make the local level food security more sustainable which includes, among others, the orientation of the households well into the new modes of agricultural production and planning of household income. The need for much more local level institutional support in many areas is highlighted. On the whole, the study addressed the concerns of food access among rural households in Rwanda, and also the much wanted institutional support being exposed.

Key words: Food access, institutional environment, food production, district development plans, farmer cooperatives, household food security.

1. Introduction

Rwanda is a land locked country, with land area of 26338 sq. km and a population of about 9.8 million (in 2008). It is categorised under the Least Developed Countries of the world. Rwanda is recovering from tragic human and economic destruction that has few, if any parallels. The genocide and civil war of 1994 destroyed the country's

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social fabric, its human resource base, institutional capacity and economic and social infrastructure. Since the genocide, the Government has worked to restore peace and revive and stabilize the economy. Per capita income in Rwanda is currently US\$520.5 (NBR, annual report 2009); equivalent to 54 per cent of the per capita income targeted for 2020; about 56.4 per cent of the population still earns less than US\$1/day. From the agricultural survey conducted in 2008, it was noticed that Rwanda had an agricultural population of 8,283,844 people. The total population being estimated at 9,831,501 inhabitants in 2008, this constitutes a proportion of 84% of agricultural population with a relatively important part of women (Republic of Rwanda 2009). The issue of tackling absolute poverty and hunger, therefore, boils down to around 1.5 million rural households in the country. Fourteen years after the genocide, 2008 confirmed the steady progress made by the country year after year (see Table 1). The economy has been stabilized and is continuing to recover strongly from the massive decline in 1994. Economic reform is underway. The estimate of real GDP growth for 2004 - 2008 is 7.8 per cent (see Table 1). As a result of stringent fiscal and monetary policies, inflationary pressures have been contained, and the inflation rate has declined from 62 per cent in 1994 to 10.9 per cent (five year average 2004-2008), (Republic of Rwanda 2009). The economic reform program goes in parallel with the efforts to achieve and maintain peace, rebuild social capital, and enhance national reconciliation (Republic of Rwanda 2007a). Studies have shown that more immediate gains in poor households' welfare can be achieved through agriculture, which can help the poor to overcome some of the critical constraints that they now face in meeting their basic needs (The World Bank, IFPRI undated, p-ix). In the case of Rwanda, in addition of the "poverty-conflict trap" (Musahara, 2005), it is also experiencing "poverty-hunger-malnutrition trap" where the health of women and children are of immediate concern.

Rwanda has set a clear strategy of development in the form of VISION 2020 (Republic of Rwanda 2002d) and also a programme for 'Economic Development and Poverty Reduction Strategy'-EDPRS (Republic of Rwanda 2007a). Also, Rwanda has designed sector specific development initiatives. All these strategic plans were

framed for an exhaustive transformation of the agriculture sector so as to bring about the necessary change that is needed in Rwandan agriculture to face the challenges of abolishing absolute poverty and hunger.

The present study, therefore, is intended to examine (i) Institutional environment at local level that facilitate for food security (ii) policies that encourage food production at local level (iii) role of farmer cooperatives in attaining household food security. On the whole, the study addressed the concerns of food access among rural households in Rwanda, and also the much wanted institutional support being exposed.

2. Role of Institutions in household food security

The understanding that economics is not just about inputs and outputs or costs and benefits has made researchers to study on the processes and institutions that facilitate agricultural and rural development, and in general poverty reduction. Institutions were defined as formal or informal rules that govern people's behaviour by providing a framework of incentives that shape economic, political, and social organization (Dorward et.al. 2009). The renewed interest on 'agriculture as the engine of development' and poverty reduction in rural areas (The World Bank 2007b) tempted the researchers to look into the dynamics of institutional factors that contribute to the household level food security in Rwanda. As we are interested in the shaping appropriate policy design for rural transformation it is incumbent on us to develop a better understanding of the institutions, which govern rural life. In this paper we have outlined the Rwandan scenario as it gives some outstanding institutional innovation scenario in the recent history of Africa.

New institutional economics (NIE) is an economic perspective that attempts to extend economics by focusing on the social and legal norms and rules that underlie economic activity. Although NIE has its roots in Coase's (1998) fundamental insights about the critical role of institutional frameworks and transaction cost for economic performance, at present NIE analyses are built on a more complex set of methodological principles and criteria. At present they depart from both mainstream Neo-classical economics and "old" institutional

economics though authors often care about both efficiency and distribution issues (Richter 2005).

It is now common in the institutional economics literature to define institutions in the very general sense of rules of structured social interaction. In any society there is, of course, a plethora of such rules (including those that undergird even a so-called free market economy). In the context of economic development the focus is on those rules that act as a substitute for missing markets in an environment of pervasive risks and severe transaction and information costs that individuals and groups face in their economic transactions with others (Bardhan 2001). In the literature on rural development at the micro-level there have been many attempts to understand institutions like land tenure, informal arrangements for credit and risk-sharing, and interlocking of credit contracts with those for future delivery of labour services or output, in the context of missing credit, insurance and futures markets and imperfect enforceability of various formal contracts (Bardhan and Udry 1999). In general, economies at early stages of development are beset with coordination failures of various kinds, and alternative coordination mechanisms - the state, the market, the community organisations - all play different roles, sometimes conflicting and sometimes complementary, in overcoming these coordination failures, and these roles change in various stages of development in highly context-specific and path-dependent ways (North 1990). North (2005) continues to define institutions as the formal and informal constraints on human interaction, the “rules of the game.” The structure of both formal and informal rules and the character of their enforcement are what define the incentives and wealth-maximizing opportunities of individuals and organizations. Such rules affect both individuals and organizations, defined as political organizations (city councils, regulatory agencies, political parties, tribal councils), economic organizations (firms, trade unions, family farms, cooperatives, rotating credit groups), educational bodies (schools, universities, vocational training centres), and social organizations (churches, clubs, civic associations). Ostrom (2005) gives a concise idea of the institutions and their functions in the following definition: ‘Formal or informal rules that govern people’s behaviour by providing a

framework of incentives that shape economic, political, and social organization'. Achieving food security needs shaping people's behaviour at local level for which we need to evolve appropriate frameworks.

When institutions are poorly defined or there are few formal institutions, economic activities are restricted to interpersonal exchanges. In such cases, repeat activities and cultural homogeneity facilitate self-enforcement. Transaction costs may be low in such an environment, but transformation costs are high because the economy operates at a very low level of specialization, as is the case in many LDCs including Rwanda. The recent book by Kirsten et.al (2009) focuses on Sub-Saharan African scenario and the works presented in the book by different researchers give a serious analysis of institutional processes and constraints in agricultural development.

The conceptual framework developed by Dorward and Omamo (2009) would be a better way of looking at the role of institutions in development. The main elements in their model are the theoretical and practical analysis of institutions and broad relationship among these elements are presented. The heart of the framework is the identification of the action domain, which defines the spheres of activity and the interest of the analysis. The action domain is set and affected by a wider environment. Institutions, activities, and actors are affected by (and in turn affect) their wider environment (Dorward and Omamo 2009). The interactions among institutions, actors, and activities involve actions that lead to outcomes. The outcomes of these actions may reinforce or change the environment, institutions, activities, and actions. This paper broadly follows the approach stated above and attempts to understand the Rwandan scenario with respect to household food security.

3. What is food security?

"Food security exists when all people, at all times, have physical and economic access to sufficient, *safe and nutritious* food to meet their dietary needs and food preferences for an active and healthy life" This widely accepted definition points to the different dimensions of food security which are: Food availability, Food access, Meeting nutritional requirements and Stability.

The first World Food Conference (1974) focused on the problem of global production, trade and stocks. Hence, the original food security debate focused on adequate supply of food and ensuring stability of these supplies through food reserves. Subsequent food security efforts focused primarily on food production and storage mechanisms to offset fluctuations in global supply and ensure the ability to import food when needed. Food availability addresses the “supply side” of food security and is determined by the level of food production, stock levels and net trade.

For food security objectives to be realized, all four dimensions must be fulfilled simultaneously. For example, even if people have money (access), if there’s no food available in the market (availability); people are at risk of food insecurity. Furthermore, food security is also about quality, and that your body must be healthy to enable the nutrients to be absorbed (utilization). These 3 dimensions should be stable over time and not be affected negatively by natural, social, economic or political factors.

The measure of the severity of food insecurity will influence the nature, extent and urgency of the assistance needed by affected population groups. Food security analysts/professionals may use the term *acute food insecurity* to describe a severe and life threatening situation. The most extreme situations, usually associated with substantial loss of life will warrant the description of famine. The measure for hunger compiled by FAO, defined as undernourishment, refers to the proportion of the population whose dietary energy consumption is less than a pre-determined threshold.

Since several non-food factors like environmental sanitation and hygiene also affect food security, we need to develop a holistic concept of food security which in the words of M. S. Swaminathan, the internationally known agricultural scientist “Food security implies livelihood security at the level of each household and all members within and involves ensuring both physical and economic access to balanced diet, safe drinking water, environmental sanitation, primary education and health care” (Swaminathan 1996, P-62).

4. Materials and methods

The general hypothesis of the study is that in order to attain the food security at local level in Rwanda, among other things, strengthening existing local institutions like farmer cooperatives, improving agricultural production technology, diversifying household income sources for better access, and genuine integration of food security concerns in the district development plans are essential prerequisites. This hypothesis reflects Rwanda's national perspective and is linked to the country's development plans (EDPRS and VISION 2020) and policies. The study made use of the available secondary data and as well the primary data that were collected from a sample study conducted in the Huye district of Rwanda. The secondary data analysis concentrated the period between 2000 and 2009, although not less frequently there is reference to the period before. One of the important sources of secondary data was the household surveys known as *Enquête Intégrale sur les Conditions de Vie des ménages de Rwanda* (EICV) of 2000-1 and 2005-06. Another important source is the surveys of Ministry of Agriculture (MINAGRI) on various aspects of the Rwandan agriculture. The publications of the National Institute of Statistics, Rwanda (NISR) were another key source of information. The main NISR publications consulted were: 'Rwanda Development Indicators' (various issues), 'Rwanda Comprehensive Food Security and Vulnerability Analysis' (2006), 'Comprehensive Food Security and Vulnerability Analysis and Nutrition Survey' (2009), 'The National Agricultural Survey 2008' (2010). The research reviewed all relevant policy and programme documents related to food security, institutional development and poverty reduction in Rwanda.

The present study also drew information from: a sample survey of 200 households (chosen from 6 sectors of the Huye district of the Southern province of Rwanda; the survey was done in August 2010, a case study of a Cooperative in Huye district, focus group discussions with community representatives, and authors' field observations. Simple statistical techniques like percentages, indexes and growth rates were used in the analysis of the data.

The 200 households in Huye district were selected by using stratified random sampling method. After, excluding the Huye urban sector,

the six sample sectors (Rusatira, Ruhashya, Mbazi, Karama, Gishamvu, and Mukura) were selected randomly. From each sector a random sample of 35 households were selected. However, from 10 households we did not get sufficient data due the absence of household head(s) at the time of the survey. After excluding those 10 households, we used the information (the sample households were interviewed with a structured interview schedule) from 200 households for the present analysis. In addition to the data collected from the households using structured interview schedule, interviews with key informants at the sector level, and Focus Group Discussions (FGD) with community representatives enhanced the reliability of the information that we collected. In addition to this we have done a case study of *COPRORIZ-COAIRWA*, a cooperative in Huye district. A randomly selected 44 cooperative members of *COPRORIZ-COAIRWA* and 21 non-members of cooperative (from the jurisdiction of the cooperative) were interviewed with a structured interview schedule. The intension of this case was to know how a cooperative perform to achieve household food security.

One of the pillars of Rwanda's agricultural development plan is institutional reforms. Thus the present study is very relevant in the sense that it takes stock of the efforts that have been undertaken by the government to attain its goal of institutional development especially how it has helped in attaining food security at local level.

5. Results and Discussions

The following four sections try to get answers to the issues related to institutional environment and household food security at local level in Rwanda. In the beginning a brief description, using some widely accepted indicators, the performance of Rwandan agriculture is presented. Following that, a display of the latest trend in poverty and inequality in Rwanda was done. The section that followed highlighted Rwanda's current scenario of food security and vulnerability. Following that we presented the data collected from the sample study. In the last part, as conclusion, we attempt some policy implications that emerge from the study.

5.1 The Current State of Agriculture in Rwanda

5.1.1 The Structure of Rwandan agriculture and food production development

The Rwandan Agriculture has witnessed changes in the post-genocide decade. The striking aspect of the transformation has been the halt of the declining trend in the sector's performance as seen from Table 1. The agricultural sector employs 80 % of active population (Republic of Rwanda 2010); it contributes 33% of GDP in 2008(see Table1) and 38.8 % of exports in 2008 (Republic of Rwanda 2009). Agricultural production in Rwanda was in doldrums even before 1994 as shown in Table 1. Between 1980 and 1989 agricultural sector growth rate was negative: -1.4, and between 1990 and 1999 it was -0.01 per cent per annum. Therefore, the present state of affairs in Rwandan agricultural sector cannot be attributed solely to war and destruction; even prior to war the sector had shown signs of stagnation.

In Rwanda, the economic situation began to deteriorate at the beginning of the 1980's when the coffee (export earner) price fell and arable land became scarce as a result of demographic pressure.

Table 1: Structure and growth of production in RWANDA - selected years

Sector	Share of GDP (in percentage)								Annual growth (in percentage)				
	2	3	4	5	6	7	8	9	10	11	12	13	14
	1989	1990	1995	1999	2003	2005	2007	2008	1965-80	1980-89	1990-99	1999-05	2004-2008
GDP	100	100	100	100	100	100	100	100	4.9	1.5	0.16	5.55	7.8
Agriculture	37	45	44	43	45	43	38	33	-	-1.4	-0.01	5.18	4.3
Industry	23	20	16	18	19	20	15	15	-	1.6	-1.17	7.5	10.4
Services	41	35	40	39	37	38	47	46	-	4.1	1.05	4.9	9.7

Source: (i) *Figures* in columns 2, 10 and 11 are from USAID.1992. *Country programme strategic plan for Rwanda, Table 2, page 10.* (ii) *Figures* in column 3, 4, 5, 6 and 12 are worked out from Table 2.2 of Republic of Rwanda.2004. *Rwanda development indicators*, Kigali: MINECOFIN. [*GDP at 1995 Constant Rwf*] (iii) *Figures* in column 7 and 13 are calculated from Republic of Rwanda. 2006. *Annual economic report 2005*, Kigali: MINECOFIN, Table-3.2.1 (iv) *Figures* in column 14 are from Republic of Rwanda.2009. *Annual economic report 2008*, Kigali: MINECOFIN, Figure-6. (v) *Figures* in column 8 are from AfDB/OECD.2009. *African economic outlook*. CD-ROM, page 708-709, (vi) *Figures* in column 9 are from Republic of Rwanda.2009. *Rwanda year statistical book*. Kigali, NISR&MINECOFIN.

The economy continued to decline during the conflict in 1990-93 and collapsed in 1994. The traditional agricultural base of the economy is not under transition as seen from the sector's contribution to GDP between 1989 and 2005. During the three decades there is an increase in the sector's contribution to GDP, from 38 % to 45% in 2003 and 43 % in 2005, which is not in tune with the general nature of agriculture's contribution to GDP which declines when countries develop. However, the promising point about Rwanda's agriculture currently is that it could halt that declining trend experience over the years and could show a growth rate of 5.55 per cent growth rate between 1999 and 2005. A decline in Agriculture contribution to GDP can be observed after year 2005.

Table 2 shows trend in *food production* in Rwanda between 2005 and 2009. The food production significantly improved during the last four years in spite of the poor performance in 2006. In volume terms, the total food crop production in 2009 was 9.3 million tons, showing a growth rate of 6.7 % since 2005 (see Table -2). The two crops - Bananas, Roots & Tubers- account nearly 78 % of the total food production in Rwanda (see Table 2).

The production of *bananas* (which accounted for 34% of the total food production) progressed at a rate of 1.6 % per annum during 2005-2009 (this low rate of growth was attributed to the Government efforts to protect and diversify of banana trees which have an effect on productivity).

Table 2: Food production development in volume terms (in thousands of tons)

Main crops	2005	2006	2007	2008	2009	% share of crops to total production (average of last three years)	simple yearly growth rate in % (2005 - 2009)
Bananas	2813.1	2653.2	2698.2	2603.9	2993.5	34.0	1.6
index	100	94.3	95.9	92.6	106.4		

Roots and Tubers	3118.1	2930.1	2543.5	3815.1	4264.9	43.5	9.2
index	<i>100.0</i>	<i>94.0</i>	<i>81.6</i>	<i>122.4</i>	<i>136.8</i>		
Cereals	409.4	361.7	355.6	461.2	615.1	5.9	12.6
index	<i>100.0</i>	<i>88.3</i>	<i>86.9</i>	<i>112.7</i>	<i>150.2</i>		
Legumes	253.3	333.7	404.9	392.3	431.1	5.0	17.5
index	<i>100.0</i>	<i>131.7</i>	<i>159.8</i>	<i>154.9</i>	<i>170.2</i>		
Fruits & Vegetables	700.2	858	903.4	961.6	950.1	11.5	8.9
index	<i>100.0</i>	<i>122.5</i>	<i>129.0</i>	<i>137.3</i>	<i>135.7</i>		
Total food production	7294.1	7136.7	6905.6	8234.1	9254.7	100.0	6.7
index	<i>100.0</i>	<i>97.8</i>	<i>94.7</i>	<i>112.9</i>	<i>126.9</i>		
Source: National Bank of Rwanda. 2009. <i>Annual Report 2009</i> . Kigali: NBR							

The production of *roots and tubers* (accounting 43.5% of the total food crop production) was also good (index was 136.8 in 2009) where Cassava and Irish potatoes were the performers, despite a decline in the production of sweet potatoes. This predominant group increased by 9.2% during the period of reference.

The Cereals, Legumes and Fruits and vegetables account for about 22 % of the total food production in Rwanda (see Table 2). All these crops performed well during the period 2005-2009. With regard to *legumes*, the index went as high as 170.2 in 2009 (this good performance was mainly observed in Garden peas, Soya beans and Ground nuts, as well resulted from expansion of cultivated land), while the index of production of *fruits and vegetables* rose to 135.7 in 2009. A remarkable increase is registered in *cereals* (the index rose to 150 in 2009 over 2005) mainly due to the high increase in the production of maize and sorghum. *Cereal* production noted an annual increase of 12.6 during the period 2005-2009. This good performance was mainly due to the expansion of the cultivated land and the use of improved seeds and fertilizers.

These indicators too hint at the transformation that is being taking place in Rwanda. No doubt, the change in the sector's performance was made possible by, among others, the institutional reforms as

substantiated in the sections that follow. It is realized that the key to poverty reduction, increased growth and its better distribution lies in developing the agricultural sector (The World Bank 2007a). In terms of some social indicators too Rwanda has been doing well in recent years as seen from the recent Rwanda National Human Development Report (UNDP 2007). Having seen the growth of Rwandan agriculture, it is necessary to move to the institutional dimension of Rwandan Agriculture.

5.1.2 Cropping pattern

Food crops occupy 67.1 % of the agricultural (Republic of Rwanda 2010). An important notable feature in crop output of Rwandan Agriculture, by looking into combination of Food Crops and Export Crop to GDP, is that the contribution of food crops has been increasing during 1999-2005 at the rate of 5.77% per annum while the share of export crop declined by -1.54 %. The index of export crops during 1990 – 2005 declined from 100 to 82.47, while that of food crops increased to 138.92. This may be, from the food security point of view, a welcome development. As noted by McKay and Loveridge (2005) “the poorest households also shifted their agricultural production out of cash crops and dedicated more land to cropping food staples. More of those staples were then consumed at home, rather than marketed, leading to nutritional improvements”.

From Rwanda 2009 CFSVA and Nutrition Survey, it is clear that, the most frequently cultivated crops were kidney beans (88%) and sweet potato (61%). Among tubers aside from sweet potato, cassava (46%) and Irish potato (25%) are also frequently cultivated. Looking at cereals, maize (38%) and sorghum (34%) were the most frequently reported, and only 5% mentioned rice. Among other crops of noticeable importance are bananas (for cooking and for beer) which are both cultivated by about 20% of the households.

Among cash crops, coffee is the most frequent (5%) with concentrations in Rusizi-Nyamasheke (14%) and Karongi-Rutsiro (11%) (Western part of the country). Tea and tobacco are cultivated by less than 1% of the households. Sugarcane (1%) and passion fruit (maracuja, 2%) are somewhat more frequent.

The usage of the main crops was also assessed. The results confirm that most of the agriculture in Rwanda is oriented towards self-consumption. For the main crops cultivated, over 70% of the production is consumed: kidney beans (86%), sweet potato (86%), cassava (79%), maize (80%), and sorghum (70%). Comparing the 2009 data with the 2006 CFSVA results suggests that kidney beans and sweet potato remain the most popular crops.

5.1.3 Use of inputs – land

The pressure on land in Rwanda led to low per capita availability of land. From the agricultural survey conducted in 2008, it was revealed that, Rwanda counted 1,674,687 agricultural households at the time, accounting for 85% of the total number of household of the country. The average area of farmlands was of 0.76 Ha by household in 2008, divided into about 4 blocks of lands. Those farmlands were on a total area of 1,280,750 Ha, which constituted half of the country total area. In addition, it is noticed that about 80% of farmlands do not measure more than 1 Ha each. Their number increased over by 9 percentage point between 2006 and 2009. There seems to be a link between size of family holding and intensity of poverty as all those provinces where the intensity of poverty is high the size of land holding is smaller than the national average (Republic of Rwanda, 2002a). However, the issue is about the distribution of land as it improves the asset base of the land less which leads to fairer rural livelihood to the poor. Studies conducted on Rwandan land issues already noted that land and environmental scarcity coupled with severe demographic pressure are associated with conflict and poverty in Rwanda (Musahara, Huggins 2004). It is estimated that soil erosion affects the ability to feed 40000 persons per year. In view of the fact that poverty in Rwanda is more rampant in rural populations that depend on land, it is logical that land reform is a prerequisite in reducing poverty and hunger and ensuring better livelihoods for the majority of Rwandans (ICARRD 2006). Production systems in Rwanda are characterised by small family farms with an average of less than one hectare in size. About 11.5 % of the households have no land to cultivate. The critical challenge to Rwandan agriculture is that of identifying alternative vocations to the surplus labour or to reduce

the pressure of population on the available meagre land area for cultivation.

5.1.4 Use of other inputs –Fertilizer, irrigation credit and new technology

The resources allocated to the Agricultural sector in the past six years are far lower than those necessary to achieve the PRS objectives and do not meet the Maputo declaration of allocating at least 10% of the total Government budget to the agricultural sector. The percentage of funds allocated to the agricultural sector to the total Government budget fell continuously from 5.8% in 2001 to about 3% in 2004 (Republic of Rwanda 2004, p. iv). The Rwandan agriculture is caught in the low investment trap and more so when the majority of farmers are having a subsistence existence (McKay A. 2007).

5.1.5 Allied Agricultural Activities

Another notable feature of the agriculture in Rwanda is its lack of diversification into allied agricultural activities like livestock, fisheries, forestry etc. This is obvious if one looks into the contribution of allied agricultural activities to agricultural GDP as it was only around 12.97% in 2005; and its share to total GDP was 5.59% during the same year and it has not shown any appreciable increase over 1990. However, there is absolute increase in this sector's contribution to GDP – about 4.53 % per annum, during the period 1999-2005. The percentage share of livestock in total GDP too shows a very low segment in 2005 (4.06 %); which was on the decline between 1999 and 2005 (in 1999 it was 4.18%). However it can be noticed that there is significant improvement in absolute figures during 1999-2005, about 5.03 % per annum change. The index of allied agricultural activities shows that its performance is catching up with food crops during 1999-2005. However, among all allied agricultural activities the performance of livestock sector still needs improvement as its relative share is rather stagnant. As per NAS 2008 there were big deficits in all livestock products in Rwanda.

5.2 Food Security and Vulnerability

5.2.1 Food deficit

Rwanda's food security/insecurity scenario can be understood from the Annual Economic Report of Rwanda (Republic of Rwanda 2006c, p-10): "The high rate of food insecurity which marked the second half of 2004 persisted until March 2005, with close to 110,000 people affected by season 2005 A crop failure, mostly in Kigali Ngali, Kibungo and Umutara provinces, which needed food assistance". Agricultural production and food import have together been insufficient to meet national minimum food needs for 1990s (UNICEF, 1998). During the decade 1987-1997, total food imports have grown at a rate of 17 % per annum; almost 72 percent of the imports in 1997 were food aid (The World Bank 1998, Table 8). The country is depending still on food imports as shown in Table 4.

In 2005 Rwanda imported (commercial) around 35 million USD worth of food items – about 79850 tons (Republic of Rwanda 2006c). However, there is a decline in commercial imports as well as Food aid since 1997 as can be seen from the Table 4- the Index is showing a downward movement.

Table 3: Food Imports 1997-2005

Type of Imports	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	2	3	4	5	6	7	8	9	10
Commercial imports (in million USD)	53.5	57.4	28	46.6	51.7	46.1	28.3	33.16	35.26
Index	100	107.29	52.34	87.10	96.64	86.17	52.90	61.98	65.91
Food aid (000Tons)	130	101.08	102	41.86	23.12	NA	NA	NA	NA
Index	100	77.75	78.46	32.20	17.78				
<p>Note: NA- data Not Available Source: (i) Republic of Rwanda.2002. <i>Rwanda Development Indicators 2002</i>, Statistics Department, MINECOFIN, Kigali. (ii) Republic of Rwanda.2004. <i>Rwanda Development Indicators 2004</i>, Statistics Department, MINECOFIN, Kigali. (iii) Republic of Rwanda.2006. <i>Annual Economic report 2005</i>, (Draft) <i>MINECOFIN</i>, Kigali.</p>									

A notable change that has taken place since 1998 was that the percentage share of food imports (Commercial imports in terms of Value) to total imports declined to 8.79 % in 2005 as against 19.27 % in 1998 (Republic of Rwanda 2002b and 2006c). This implies that the country is trying to cover the food deficit (see Table 4) by concentrating more on local production. The Table 5 shows the food balance sheet for 3 years, 2004-2007.

Table 4: Food Balance (in 1000 MT Cer-Eq)

Quantities	2004A	2004B	2005A	2005B	2006A	2006B	2007A
Consumption*	1016	1021	1031	1045	1058	1092	1090
Production	910	901	914	1044	920	1061	938
Net Imports	141	150	141	141	141	141	141
Food Deficit	-35	-30	-24	-140	-3	-111	10

Note: (*) Calculated consumption on the basis of 2100 Kcal/personne/jours with 1 equivalent-cereal kg = 3225.32 Kcal; A= Season A, B= Season B

Source: Republic of Rwanda. 2007. *Agricultural Sector Performance in 2006: Report of the Joint Budget Sector Review V*, MINAGRI, Kigali, Table Annex .4

5.2.2 Food Access and Consumption

Access to food, mostly monitored at household level, is the ability of the household to regularly acquire adequate amounts of food through a combination of their own home production and stocks, purchases, barter, gifts, borrowing or food aid. Using the food consumption score (FCS), the 2009 *Rwanda Comprehensive Food Security and Vulnerability Analysis and Nutrition Security*, (RCFSVANS) found that 4.2% of the households have poor food consumption, 17.3% have borderline food consumption, and 78.5% have acceptable food consumption (see Table 6). Among the poor food consumption group, the diet is predominantly based on tubers (consumed on average 4 days a week) and cereals (3 days a week). The borderline group shows an increase in the consumption of pulses (from 1 day/week among the poor food consumption group to 4 days/week on average), and to a lesser extent, increases in the consumption of vegetables and oil. Among the acceptable food consumption group, tubers and pulses are consumed nearly on a daily basis while cereals and oil are consumed for over four days a week. The consumption of milk and meat which was about non-existent among the poor and

borderline food consumption groups, is more frequent in the acceptable group but still below one day a week on average.

5.2.3 Changes in food consumption 2006-2009

The 2006 CFSVA data were re-analysed to adjust for the methodology used in 2009 (e.g. only consider households with children below 5 years old). The results suggest an overall improvement in food consumption. In 2006, 7% of the households were considered as having a poor FCS, and 28% had a borderline FCS, compared to respectively 4% and 17% in 2009. The improvement may reflect a general trend towards better food security, however, it is also possible that the results reflect cyclical phenomenon: the 2009 CFSVA and Nutrition Survey was conducted shortly (February-March) after a good agricultural season, while the 2006 CFSVA was conducted later in a post-harvest season after a somewhat poor harvest, thus food availability was likely to be lesser in 2006 compared to 2009.

Looking at the proportion of households with a poor FCS by strata confirms the overall improvement in food consumption, with some regional variations. First, it should be noted that while prevalence of poor FCS has decreased overall, the relative importance of poor FCS across strata has somewhat changed. The 2006 and 2009 data both suggest a concentration of poor FCS in the western part of the country. However, in 2006, the proportion of households with a poor FCS was relatively low in Nyabihu and Ngororero, while it was the highest in 2009. The prevalence has decreased but remains one of the highest in Nyaruguru Nyamagabe. Data for two strata, Rulindo-Gicumbi and Kirehe-Ngoma-Rwamagana, indicates that there have been significant improvements in food consumption resulting in 1% or less having a poor FCS. Among the strata in Eastern Province, Bugesera is the only one where the proportion of households with a poor FCS remained constant (5%).

5.2.4 Food consumption groups and livelihood strategies

Looking at livelihood strategies, prevalence of households with a poor FCS further suggests that agriculturalists (low income), agrolabourers and marginal livelihood households are most vulnerable to

food insecurity. Agriculturalists-low income (6% of households with a poor FCS), agro-labourers (7%) and marginal livelihoods (7%) together accounted for 73% of all the households with a poor FCS, although they represent only 46% of the total population. Agriculturalists and agro-labourers alone accounted for 67% of all the poor FCS households and 43% of the total population.

5.2.5 Other characteristics associated with food consumption groups as indicated by RCFSVANS

This survey data suggests that **female headed households** are more likely to have poor food consumption: 21% of the poor FCS are female headed households, compared to 17% among borderline FCS and 11% among acceptable FCS. However, the analysis did not find a significant association with the **age** of the household head. In addition, the presence of a **chronically ill person** in the households was associated with poor food consumption: among the households with poor FCS, 22% had a chronically ill member, compared to 12% in households with a borderline FCS and 11% in those with an acceptable FCS. The presence of **orphans** and the **death of a household member** within the last 6 months prior to the survey were not significantly associated with a poor FCS. With regards to orphans, it is possible that orphans are hosted by better off households who can afford to provide them with support.

Households with an acceptable FCS are less likely to have an **uneducated head** (30%) compared to households with a poor or borderline FCS (respectively 38 and 39%, no significant differences). Although the difference is small, households with an acceptable FCS had on average a significantly lower **crowding index** compared to households with a poor or borderline FCS.

The proportion of households cultivating less than 0.1ha of **agricultural land** is highest among poor FCS group (36%) compared to those with a borderline FCS group (27%) and an acceptable FCS group (16%). In addition, **diversity of agricultural production** (percentage of households cultivating four crops or more) and **ownership of livestock** (as measured by the average TLU) are lower among households with a poor FCS.

The proportion of households with a poor FCS was highest among households in the lowest wealth quintiles. Overall, the CFSVA and Nutrition Survey found a significant association between the food consumption score and the **wealth index** (Pearson's $r = 0.5$, $p < 0.001$). However, there were no associations found between food consumption and wealth-related indicators such as access to improved **sources of water** and improved **toilets**.

Still in relation with the livelihood assets and strategies, the data suggest a link between the ability of a household to draw on **multiple activities** to sustain its livelihood and food consumption: The proportion of households conducting only one activity is higher among households with a poor FCS (45%), compared to those with a borderline FCS (37%) or acceptable (31%) FCS.

Finally, looking at **expenditures**, the survey found no significant differences between households in the poor and borderline food consumption groups. However, households with an acceptable FCS on average spent more on food and non-food items in absolute value compared to the other households, while the proportion of food expenditures to the total expenditures was lower.

5.3 Institutional system for local development in Rwanda

Since 2000, the Government of Rwanda (GoR) has been engaged in the implementation of the Decentralization Policy. The policy has 5 strategic objectives and is essentially intended to promote good governance, accountability and transparency in Rwanda by making leaders directly accountable to the communities (Republic of Rwanda 2002b). Even the PRSP of Rwanda is centred on, among others, governance and institutional capacity building (Republic of Rwanda 2002a).

In Rwanda, through traditional community development initiatives such as *Umuganda* (public works with community participation) and *Ubudehe* (citizen's participation through local collective action with support from local government, NGOs, local resource people and donors) or justice and conflict resolution mechanisms like *Gacaca* (participatory framework to expedite the delivery of reconciliatory justice to the people accused of genocide crimes) and *Abunzi* (a

framework for social conflict mediation), communities have assumed ownership of their plans and priorities. While the decentralization strategy of the GoR will build upon existing (formal and informal) mechanisms of community participation, the existing knowledge of these participatory practices at the local level is weak, and there is very limited documentation, systematization, and analysis of these practices. Rwanda's Decentralisation vision (2007-2011) is premised on the following key institutional objectives as detailed in the Rwanda Decentralisation Strategic Framework (RDSF), (Republic of Rwanda. 2006f): i) Reinforcing the defined roles, responsibilities, capacities, and accountability of the organs, structures and services of public, private, and civil society stakeholders in local governance; ii) Empowering citizen engagement, action, and recourse to decision making through the institutionalisation of participative and collaborative processes at all levels of governance. The second objective is also the cornerstone for decentralisation in Rwanda's Vision 2020. At the same time, initiatives have emerged and been promoted to strengthen the voice and capacity of end-users to directly demand greater accountability and responsiveness from public officials and service providers (Republic of Rwanda. 2006c).

5.3.1 Institutional environment at local level that facilitate development

Already there are many efforts in Rwanda to address the food insecurity. The document prepared by MINAGRI on food security highlighted the existing constraints for the improvement of food security in Rwanda which are: macroeconomic constraints like debt, lack of competition, marketing constraints and narrowness of the domestic markets, land-lockedness, and low urban base. Constraints to agricultural production are linked to soil fertility, scarcity of production means, high pressure on natural resources, and insecurity and risk. Agriculture in Rwanda remains very vulnerable to the vagaries of climate, with a continued lack of adequate irrigation and water storage systems.

The District Council approves the District Development Plan (DDP) and the *District Executive Committee* implements decisions of the District Council. It coordinates the elaboration of the district plan and

promotes development in a variety of fields. *Sectors* are tasked with a variety of services (Sector Council and Executive Secretary looks after sector matters) such as land planning, infrastructure development, the design and implementation of District Development Plans (DDPs). The sector is increasingly becoming the level at which most public services are delivered. ***The Community Development Committees (CDCs)*** were created in the first phase of Rwanda's decentralization program in order to lead the planning process at the local level. They are defined as a technical organ in charge of coordinating development activities and act as key actors in the design of District Development Plan (DDPs). In September 2006, CDCs were institutionalized and are required to be operating at the cell, sector, and district levels. CDCs were effectively designed to serve as the interlocutor between the community and local government structures. CDC members are elected officials of the community and as such, are accountable to the local population. ***Joint Action Forum (JAF)*** is a coordination forum of project representatives, donors, faith-based organizations, the private sector, the District CDC, and all others who have a stake in the development of districts. It is chaired by the Mayor and is intended to foster greater aid effectiveness through the allocation of external funds to needs identified in the DDP. It allows stakeholders to voice their opinions and provide feedback about development processes to the district. The JAF is fairly new and not yet active in all districts (see figure 4).

District Performance Contracts (imihigo) first signed between H.E The President of the Republic of Rwanda and Mayors of the District in April 2006 are a very important concept in the move to performance based planning and budgeting and are a revolutionary move towards accountability and transparency in service delivery. In 2007 Imihigo culture was practiced from the district down to the Village level- the lowest administrative unit.

Figure 1: Framework for decentralised accountability in Rwanda



Source: Musoni Protais. (2006) Progress in decentralization reforms. Accessed on 30-10-2007 from www.devpartners.gov.rw/.../2006_DPM/Presentations/Session%204/Decentralization.ppt

5.4 Role of farmer cooperatives in attaining household food security

Through many actions and appropriate measures of the Rwanda Cooperative Agency and other implementing partners, agricultural cooperatives have been promoted. As the government is responsible of guidance and inspection of the business and management of agricultural cooperatives (Dorsey and Tesfaye, 2008) the decentralization policy should influence positively the improvement of farmer cooperatives and therefore the enhancement of the rural population livelihoods. This is confirmed by the findings that stipulate that the number of households who participate in farmer cooperatives have been increased by about 11.5% and people who were not member of any cooperative or other organization have decreased by about 17.5%. The present study enquired of the membership of households in Huye district in local organisations. The results are shown in Table6. It is noted that still a big percentage (57%) of the households have not joined any local associations

Table 5: The membership in local organisations: response from sample respondents in Huye district

<i>Name of sector</i>	<i>member of any local organization</i>				<i>Total</i>
	<i>None</i>	<i>cooperative</i>	<i>Farmer organization</i>	<i>other associations</i>	
<i>GISHAMVU</i>	30	2	0	0	32
	15.0%	1.0%	.0%	.0%	16.0%
<i>KARAMA</i>	25	3	4	2	34
	12.5%	1.5%	2.0%	1.0%	17.0%
<i>MBAZI</i>	14	11	2	2	29
	7.0%	5.5%	1.0%	1.0%	14.5%
<i>MUKURA</i>	22	3	4	5	34
	11.0%	1.5%	2.0%	2.5%	17.0%
<i>RUHASHYA</i>	14	9	6	8	37
	7.0%	4.5%	3.0%	4.0%	18.5%
<i>RUSATIRA</i>	9	11	7	7	34
	4.5%	5.5%	3.5%	3.5%	17.0%
<i>Total</i>	114	39	23	24	200
	57.0%	19.5%	11.5%	12.0%	100.0%

Source: Results of our analysis

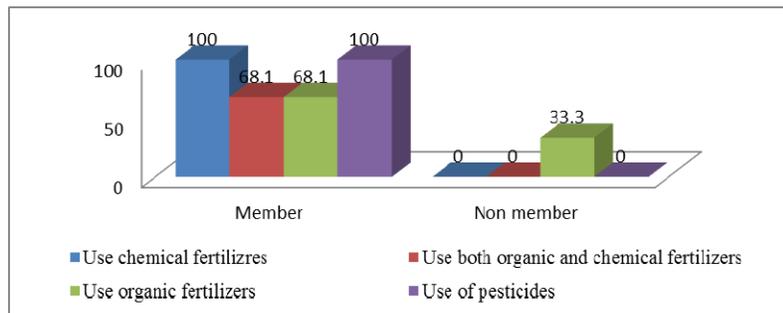
Local leaders have managed many efforts in sensitizing people to join farmer cooperatives and other rural organizations. These play an important role and contributed largely to the development of the agricultural sector in the country in general and to improvement of the living conditions of rural population in particular. There are substantial cooperatives undertaking marketing and processing functions in the rice, fruits, and horticulture industries. Agricultural cooperatives are also important in providing agriculture input so that to increase production, the farm supply and financial services in rural areas.

5.4.1 Impact of COAIRWA on household food security- A case study of a cooperative

We have done a case analysis of a Rice farmer’s cooperative of Rwasave (COAIRWA) in order to understand in-depth its functioning. COAIRWA is a registered rice grower cooperative located in Rwabuye village, Mbazi Sector, Huye District, South province of Rwanda. Started as IMPUAIWA (Farmer’s association of Rwasave wetland) in 2000 the association was transformed into cooperative on 9/2/2007 known as COPRORIZ-COAIRWA. The cooperative started with 328 members who signed the cooperative statute and 1, 640, 000 Rwf as social capital. Currently COAIRWA has 1564 members (692 male and female 872) and their shares equal to 7820, 000Rwf.

COAIRWA has the objective, among others, of ensuring food security for its farmer members. The study has looked into how the Cooperative helped the farmers in achieving food security. The Figure 5 presents the comparison between members and non-members of the cooperatives with respect to inputs used. It shows that the cooperative facilitate the members to have access to inputs which leads to better agricultural output for the cooperative member farmers (our study has shown that there is statistically significant difference between the mean output of members (average 745Kg paddy per household) and non-members (average 467 Kg) .

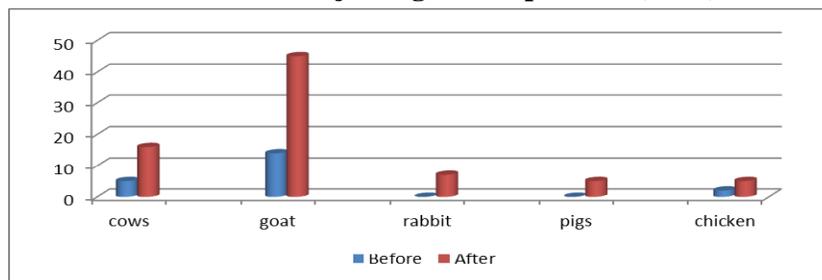
Figure 2: Comparison of different inputs used by member categories (in %)



Source: Results of our analysis

Further we looked into the livestock holding of the members before and after joining the cooperative and found that after joining the cooperative there is increase in the percentage of households own livestock which is an indication of diversification of household income sources.

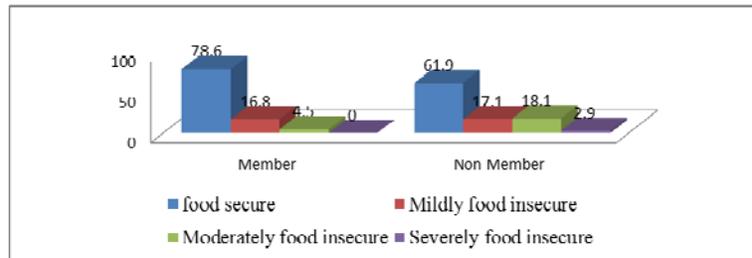
Figure 3: Livestock holding by cooperative members before and after joining the cooperative (in %)



Source: Results of our analysis

Following Jennifer Coates et.al we have looked into the Household Food Insecurity Access Prevalence (HFIAP). This indicator categorizes households into four levels of household food insecurity (access): food secure and mildly, moderately and severely food insecure. Households are categorized as increasingly food insecure as they respond affirmatively to more severe conditions and/or experience those conditions more frequently (Jennifer Coates et al. 2007). The following figure 7 gives the picture of the cooperative members and non-members in the study region with respect to their food insecurity (access) category. It is seen that the cooperative members are more food secure compared to their fellow farmers who are not members of the cooperative.

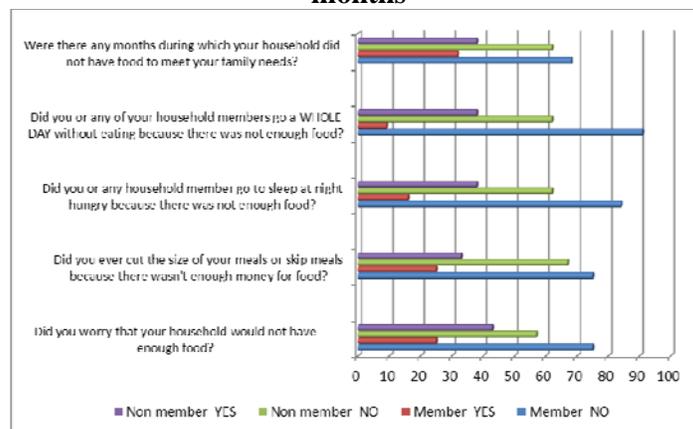
Figure 4: Percentage of households that fall in each food insecurity (access) category.



Source: Results of our analysis

Further we also posed some questions (*Did you worry that your household would not have enough food?; Did you ever cut the size of your meals or skip meals because there wasn't enough money for food?; Did you or any household member go to sleep at night hungry because there was not enough food?; Did you or any of your household members go a WHOLE DAY without eating because there was not enough food?*) to the sample respondents in order to know the severity of food security in their households and the results are shown in Figure .

Figure 5: Situation of household food security among cooperative members and non-members in the past twelve months



Source: Results of our analysis

The local cooperative has become an agent of rural transformation. This is because there are many Central Government agencies (for instance RADA -Rwanda Agricultural Development Authority) and programmes (for instance RSSP- Rural Support Sector project); as well many national and international NGOs (for instance ARDI) do collaborate with the cooperative in making agricultural production more efficient. The RADA helped with the availability of seeds, fertilizers and pesticides. Every month the cooperative board director in collaboration with RSSP organize trainings on food security for its members in term of Nutrition and health education (hygiene). Cooperative members receive fairer weight and quality evaluations, better marketing and transport services, and higher revenues per kg and per land size than non-members. ARDI help cooperative members by distribution of seeds (for example cabbage, calotte, tomato, etc.) and fertilizers in the area which helps in the increase production. COAIRWA in collaboration with RADA is helping them become financially and institutionally self-sustaining. By developing market linkage and internal training capacity at the union level, it ensures that the cooperative have the ability to continue to develop business skills of its members. At the moment, farmers cannot get credit elsewhere, so the cooperative is taking steps to set up a credit union for their members as soon as possible (SACCO- Saving and Credit Cooperative).

The researchers do interview some other cooperative leaders (e.g. 'CoprORIZ', 'Twitezimbere', 'Twongerumusaruro') to know the impact cooperatives make on household members 'food security'. All cooperative leaders interviewed affirmed that the cooperative members are more productive and it is easier for them to get not only the land for cultivating but also to get ameliorated crop production. Besides getting the land and improved crops, through cooperatives, members are taught to prepare their own vegetable garden at home (important for the food security improvement). They are also encouraged and sensitized about the importance of savings (in banks) for their own development.

One of the cooperatives (Twitezimbere) contributes to the food security of the household by giving plant protection measures and sometimes money in advance for the household which they pay after

the crop harvest. In fact, ‘this encouraged people, even the laziest to work for their production to be sold and get money!’ observed the cooperatives’ manager. Further the cooperatives sensitise the members on the on-going agricultural reform, especially for cultivating improved seeds in tune with the priorities of local government. They are also advanced in agro processing small industry for good conservation (they produce cassava floor of good quality, and banana juice) and this encourages the local population to produce as they have markets, and they are employed in those small-scale industries to get an income.

Further some of the development programme, like VUP Umurenge, does help people to improve their living conditions. However, more needs to be done. In some cooperatives, members are still suffering for a lack of market for their product (especially rice) where because we are now entered in East African community, one can found a rice with high quality (from outside) for the lowest price. Besides, mismanagement of cooperatives was found to be one of the factors affecting the cooperatives’ improvement (‘Coprорriz’). Basic infrastructure which can facilitate food availability like markets and roads are not developed. Local people reported that the involvement of local authorities in charge of agriculture is still very low to motivate farmers.

To sum up, the role of farmer cooperatives is crucial in achieving the food security level needed for rural population. The needed steps are still on the beginning and many efforts are to be managed because the participation in rural organizations by rural people is still very low (43%).

1. Conclusion and policy implications

Constraints to agricultural production are linked to soil fertility, scarcity of production means, high pressure on natural resources, and insecurity and risk. Current understanding maintains that agriculture is sustainable when current and future food demands can be met without unnecessarily compromising economic, ecological, and social/political needs. Yet, its operationalization can be problematic. Agriculture in Rwanda remains very vulnerable to the vagaries of

climate, with a continued lack of adequate irrigation and water storage systems. Rwandan rural households have faced production deficits due to drought, pests and diseases in various crops. Among the factors that correlated with food security the following are of direct link to agriculture: (i) Land size (ii) Poor income is more likely to be food insecure. As agriculture is the main livelihood of nearly two third of the population, especially of agriculturalist and Agro-labourers, any effort to attain food security boils down to Rwandan agriculture.

The population of Rwanda is growing. Besides population increase, improved purchasing power among the poor will enhance the demand for food. In contrast per capita availability of arable land is shrinking. Water use efficiency is very low. There is still a widespread mismatch between production and post-harvest technologies, especially in perishable commodities, which affect the interest of both producers and consumers. The failure to achieve agricultural intensification and diversification is predominantly agricultural country like Rwanda will be socially disastrous. This is because, agriculture including crop and animal husbandry, forestry, fisheries provide livelihood to nearly 85 % of Rwanda's population. The smaller the farm, the greater is the need for higher marketable surplus for increasing the income. Even a million new livelihoods will have to be created in the coming years in Rwanda. Rwanda needs (i) greater investment in irrigation and technology development and dissemination leading to enhanced production and productivity (ii) better distribution through the public distribution system (iii) adequate food reserves (iv) purchasing power enhancement through employment generation and guarantee schemes, and (v) special intervention programme for children, pregnant and nursing mothers and old and infirm persons.

Rwanda faces two basic food security challenges: First, maintaining the availability of food through production within the country, which is constrained due to conditions diminishing land resources, soil depletion, inadequate investment in the infrastructure and not enough availability of technology. Second, expanding the economic access to food at household level under conditions of insufficient growth in household income arising from slow growth in diversification of the

Rwandan economy. Therefore, the two food security challenges of Rwandan economy is that of sustaining the availability of food and expanding the economic access to food, thereby ensuring food security all at the household level. This, obviously, is unattainable without appropriate public policies and sufficient investment so as to build up the productive capabilities and access to income and entitlement to food.

The general conclusion that emerges from the study is that in order to attain the food security at local level in Rwanda lot more to be done. Among other things, strengthening existing local institutions like farmer cooperatives, improving agricultural production technology, diversifying household income sources for better access, and genuine integration of food security concerns in the district development plans. The orientation of the households well into the new modes of agricultural production and planning for which there is the need for much more local level institutional support in many areas. On the whole, the study addressed the concerns of food access among rural households in Rwanda, and also the much wanted institutional support being exposed.

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