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Thesis Research for the award of a MSc Degree in Agriculture

Topic:

**“SOCIO ECONOMIC AND ENVIRONMENTAL IMPACT
ASSESSMENT OF ONE VILLAGE ONE PRODUCT
APPROACH”**

**Case study of COFFEE INTENSIFICATION PROJECT FOR
POVERTY REDUCTION IN NZEGA CELL, GASAKA
SECTOR, NYAMAGABE DISTRICT”**

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HUYE, DECEMBER 2011

DECLARATION

I BANANEZA Emmanuel Octave, confirm that the work presented in this dissertation entitled “Socio economic and environmental impact assessment of the Coffee Intensification project for poverty reduction in Gasaka sector of Nyamagabe district” is my original work.

To the best knowledge hereby, I declare that the work presented in this thesis contains no material presented elsewhere as a thesis for the award of any academic qualification, except some references in terms of books or any other written and electronic material made concerning other people indicated in the reference in the text.

I thus declare that this work is mine and was completed successfully under the supervision of Dr BIZOZA R. Alfred.

Emmanuel Octave BANANEZA

Signature:

Date:

DEDICATION

To the Almighty God,

My dear wife URUKEREREZA Dative

My dear sons BANANEZA Nshuti Ossana Dyllis

And BANANEZA Mugisha Emery Gustave

My friends, relatives and colleagues

With all my heartfelt gratitude, respect and appreciation

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A valuable contribution and assistance rendered to me, as I was struggling to accomplish my work and studies; some people deserve a particular recognition. On this note therefore, I would like to extend my special heartfelt gratitude to my lovely wife URUKEREREZA Dative for her deep encouragement and concern, my son Ossana Dyllis BANANEZA for his bright jovial smile, your care and love supported me during hard times.

Relatives, friends and colleagues played an important role in accomplished this work. I will always remember the contribution of the following families; Silas RUKUNDO, UWINEZA Silvestre, NDINDABAHIZI Innocent and support from Reverend Dr Eleazar Octavier ZIHERAMBERE and Reverend Dr Michael FEICHT through the First Baptist Church of Haddonfield.

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May God bless you all

EXECUTIVE SUMMARY

Rwanda is the most densely populated country in Africa with a population of 10,185,435 in 2009 on area of 26,338 Km². Agriculture sector provides livelihood for 87% of the population in the country and contributes to (40-43%) of the gross domestic production (GDP). This leads to an over exploitation of natural resources causing the decline in soil fertility, land scarcity due to splitting of arable land, food shortage, erosion, environment protection concerns which caused increased poverty level. The rapid demographic growth has let policy makers in worries and appropriate strategies/measures need to be done to ensure a sustainable development for the country. For the last decade, the government of Rwanda initiated various economic and agricultural reforms which aimed to bring rational and sustainable solutions to the issue of endemic poverty.

This research focused on analyzing the socio-economic and environment impacts of one of the development policies/approaches in the country. The One Village One Product approach (OVOP), was initiated to bring together synergies between land , agriculture and housing reforms through respectively consolidation of land use, agriculture transformation and living in village settlement.

The choice for coffee intensification by the Nyamagabe District was caused by the fact that the climate and soil conditions are suitable for its growing; its contribution for the last 50 years as the main source of foreign currency for the country and recent efforts by the government to reform the coffee sector in order to become more competitive and generating more incomes to primary producers in cooperative.

The hypothesis for this study is: “The OVOP approach through the coffee intensification project in Nyamagabe district has improved the livelihoods of farmers/households involved” the main objective of this study being to assess the current socio –economic and environment impacts of the One Village One Product (OVOP) approach in regard of the Coffee Intensification project in Nyamagabe district through land use consolidation and crop intensification (monoculture) systems.

It has come to support the district in its efforts to alleviate poverty within rural population through new income generating opportunities by developing high value added commercial crops. The absence of land consolidation in a context of land scarcity and

excessive split plot combined with the lack of crop intensification in the area (GASAKA-NZEKA) was keeping the population in extreme poverty. The Coffee Intensification Project for poverty Reduction in Nyamagabe District is in line with various development policies that Government of Rwanda has been initiating or adhering to for the last decade (decentralization policy, land reform policy, crop intensification program, the vision 2020, Economic Development and Poverty Reduction Strategy, the strategic plan for agriculture transformation, the Millenium Development Goals, etc...).

The implementation of activities of the coffee intensification project for poverty reduction in Nyamagabe district, Gasaka sector has had various positive impact such as: cultivation of coffee on 90,9 ha, exploitation of spaces/hills which were abandoned/shrubs, reinforcing soil conservation measures on cultivated land (terraces and erosion control contours), fruits, and agroforestry trees; forages, fixing plants, organization of local population into cooperative, introduction of the land use consolidation approach, market oriented production, emergence of entrepreneurial spirit, increasing incomes and enabling the beneficiaries to participate/contribute in different development and social programs (9 years based education, health insurance, Girinka, saving and access to loans). The project also supported the capacity reinforcement of the beneficiaries' organizational body (KOKA cooperative); the financial support in term of monthly subsidy to ensure food security of involved households; and diversification through the development of small income generating projects associated or complementary to coffee growing to increase their incomes. 104 households got support for livestock (cow, rabbits and pigs). With the 175009 new coffee trees ready for production in 2012 and the 32926 old coffee trees with a current capacity of 112T; it is expected that the consolidated land produce around 300T of coffee cherries thus a need for a washing station. Key issues that need particular attention are identified and mitigation measures proposed accordingly.

Being in its 3rd year, the achievements of the project had so far reached some of its objectives such as changing positively the rural livelihoods, increasing their annual income from 100US\$ up to 778 US. The project covers a total number of 253 households with 219 qualifying for the monthly subsidy with 1121 members out of which 586 are women and 535 men. This study focused on a sample of 157 households with 698 members.

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LIST OF ABBREVIATIONS

EDPRS: Economic Development and poverty reduction strategy

EIA: Environmental Impact Assessment

GDP : Growth Domestic Product

IA: Impact assessment

KOKA: Koperative Kawa Ndatwa

LDC : Least Developed Country

MDG : Millenium Development Goals

MINAGRI: Ministry of Agriculture and Animal resources

MINECOFIN : Ministère de l'Economie et de Finances

NAEB: National Agriculture Export Development Board

NISR : National Institute Of Statistics of Rwanda

OCIR-CAFÉ: Office des Cultures Industrielles du Rwanda/CAFÉ

OVOP: One Village One Product

PAGOR : Projet d'Appui á la Gouvernance Rurale

RAB: Rwanda Agriculture Board

RDB: Rwanda Development Board

REMA: Rwanda Environment Management Authority

SEIA: Socio economic Impact Assessment

SIA: Strategic Impact Assessment

SPATII: Strategic Plan for Agriculture Transformation II

CHAPTER I: INTRODUCTION

1. Background

Agriculture is the main activity of Rwandan rural population. It contributes highly in terms of employment. The 2002 Household Living Standards Survey (MINECOFIN, 2002), found that 87% of the active population is engaged in the agricultural sector ; and the share of agriculture in the GDP varied from 43.4 to 40.5 % the period 1999 to 2004 (MINAGRI, 2006). While more than 10 million population of Rwanda on an area of 26 338 km² with a population density of 407/ km² (NISR,2011); depending largely on subsistence farming for their survival; there is a need of having a new agricultural system which ensures production increase.

The Rwandan Government has recently adopted new agricultural and land policies that strive to increase productivity in the agricultural sector through land use consolidation and crop intensification as the Asian Green revolution model. Those policies have been identified in line with Rwanda 2020 Vision, EDPRS and MDGs aiming to transform the agrarian sector into a professionalized motor for economic growth and pro-poor rural development.

1.1 Problem statement

Agricultural systems in Africa are severely challenged by various drivers of change such as increasing population growth an increasing demand for food and livestock products and climate change (IAASTD, 2009; Jones, P.G. and P. K. Thronton, 2009).

At the same time, both scientific scholars and policy makers have rediscovered the agricultural sector - after decades of neglect - as an important motor for pro-poor growth (Ansoms, A. 2010). As a matter of fact the 2008 World Development Report focuses on agriculture's role in poverty reduction and overall development. It pleads for a Green Revolution in Sub-Saharan Africa. This report specifies that the Green Revolution in sub Saharan Africa will have to be essentially different from the one that took place in Asia during the 1960s and 1970s, as it should be adapted to the agricultural ecosystems and the institutions in the African continent (World Bank, 2007).

The question as to which kind of policy instruments are suitable for supporting smallholder agricultural production modes is still open for debate. On one hand, there are

actors pleading for maximal agricultural growth through technological improvements, increasing commercialization of agricultural products, and through private sector involvement (e.g. the rationale of the Bill and Melinda Gates Foundation, criticized in Patel et al., 2009). On the other hand, there are scholars who maintain that agricultural reforms occur in a space where various social actors have unequal bargaining and negotiation positions due to the asymmetry of social class power (Borras, 2003). Policies should therefore focus upon facilitating smallholders' access to markets, technology, risk-coping mechanisms (World Bank, 2005) and the distribution of crucial assets, particularly land (see e.g. the alternative to market-led land reform promulgated by La Vía Campesina, Desmarais, 2002). The question as to where policy makers put their focus, has obvious consequences upon the policies themselves: do they opt for maximal growth of agricultural production and productivity, or do they focus on a maximal pro-poor effect by improving the bargaining power of the poor in the production process?

Rwanda has long been a densely populated country, confronted much earlier with severe land-scarcity than the rest of the African continent. Since the early sixties, the expansion of arable land could not keep pace with Rwanda's impressive population growth. However, despite declining land availability, food production per head remained considerably high (with fluctuations) until the mid 1980s in comparison to Sub-Saharan Africa, the inventiveness of the small-scale farming model seemed to avoid or at least postpone a Malthusian trap (Pottier and Nkundabashaka, 1992). Nonetheless, the Rwandan government is rather clear in its ambition to achieve a Green Revolution-type agrarian reform. Together with a knowledge based economy, the Rwandan government aims for GDP growth to be led by a major increase in overall output and productivity in the agricultural sector, while devoting little attention to the distribution of such growth. Policy makers thereby implicitly assume that a growth strategy based on agriculture is 'designed' to be pro-poor (MINECOFIN, 2002).

The Rwandan Agricultural Policy, and the subsequent Strategic Plans for Agricultural Transformation (2005-2008, and 2009-2012) (MINAGRI, 2004A; MINAGRI, 2009) aim to transform the primary sector into a growth engine through a focus upon agricultural modernization, intensification, professionalization and private sector involvement. The strategies focus upon the development of commodity chains with export potential, or upon crops with great importance for internal markets where the policy makers see a major role for the private sector. Crop intensification - through regional specialization

and the promotion of monocropping - is seen as an important trigger for the commercialization of agricultural production, and the modernization of the sector as a whole.

The One Village One Project (OVOP) approach for coffee intensification initiated in Nyamagabe District is in line with the current agricultural and land management policies (Nyamagabe, 2009).

The administration of Nyamagabe district in partnership with its development partners, in their efforts to improve the livelihoods of the poorest/vulnerable villages, identified 253 targeted households in Gasaka Sector , Nzega cell to be part of a coffee intensification project designed under OVOP approach.

Farmers, organized in cooperative; put together their farms/plots for a common exploitation of coffee on an area of 112 hectares, leaving behind the agricultural practices depending on subsistence production of food crops; for a more generating cash crop commodity which is coffee. Coffee was chosen after considering its production potential in the area due to conducive soil and climate conditions. However the coffee growing is done on a hilly, land lock soil and has significant impacts on the physical and human environment of the local population.

The beneficiary households, get a monthly subsidy to cover up their food expenses and maintain coffee plantations. A number of off farm activities complementary to coffee have been identified and initiated to maximize income generating opportunities.

The major key stakeholders in this project are:

- Nyamagabe district the initiator and supervisor of the project;
- PAGOR project which supports with the subsidy and other financial support mainly for the farmers organization KOKA;
- Local population of concerned villages that put their plots together to have coffee consolidated blocks as one village one product.

1. 2 Objectives

The overall objective of this study is to assess the current socio –economic and environment impacts of the One Village One Product (OVOP) approach for the Coffee Intensification Project in Nyamagabe district through land use consolidation and crop intensification (monoculture) systems.

Specific objectives are:

- Identification of challenges, constraints, bottlenecks and opportunities for the project in regard to the interventions and investment already done both by the farmers, the district and supporting donors;
- Assess the land use consolidation policy associated to crop intensification approach for coffee in general and advise accordingly;
- Assess the socio-economic and environmental effects of the project and the level of their impacts;
- Propose erosion control, soil and environmental conservation measures to ensure the sustainability of the project in a social-economic and environmental friendly way.

1. 3 Hypotheses

For this research, the hypothesis is formulated as follows:

“The land use consolidation policy through One Village One Product approach ; has a positive impact on the environment and has improved social and economic conditions of farmers/households involved”.

1. 4 Research questions

This research aims at answering the following questions:

- 1) What are the environmental impacts of the land use consolidation policy through One Village One product approach?
- 2) What is the impact of this project on the livelihoods of beneficiary farmers/households? What are the negative impacts and how they can be addressed?

1. 5 Scope of the study

The research will essentially focus on the current Coffee Intensification Project based on One Village One Project (OVOP) approach in a context of land use consolidation and crop intensification being implemented in Nyamagabe district. It will seek to identify its positive impacts on the environment and livelihoods of the beneficiary households/farmers and the district in general but also find out negative impacts and suggest strategies to come over them to reach successfully the objective of alleviating poverty in bringing a sustainable development in the area.

1. 6 Significance of the study

The study is aimed at assessing/analyzing the impact of various policies and interventions involved in the project and the role of stakeholders or their level of intervention. Those policies and approaches are the land use consolidation which is in line with the new land reform policy, the crop intensification to ensure food security and sufficiency by increasing production, the One Village One Project (OVOP) approach, the value chain management through increase of production, value addition, exploration of market niches and village settlement.

1. 7 Organization of the study

This study is organized in four chapters: chapter one provides some background and justification of the research topic and identify objectives of the study; chapter two gives the definition of keys concepts and an overview of the Rwandan Agriculture sector and coffee subsector; chapter three assesses the research methodology used for this study and finally the chapter four which focuses on presentation, interpretation and analysis of the results;

Finally a general conclusion and a set of recommendations is given for future consideration in planning, follow up, monitoring and evaluation processes of the land use consolidation policy in a context of One Village One Product (OVOP) approach implemented through Coffee Intensification Project in Nyamagabe.

CHAPTER II: DEFINITION OF KEY CONCEPTS

2.1 Definition of key concepts

For the purpose of understanding widely the objective and the scope of the study as well as its results; following key concept need to be explained/defined in detail: impact assessment (IA), Environmental Impact assessment (EIA), Socio Impact Assessment (SEIA), One Village one product (OVOP) approach, green revolution, decentralization, crop intensification program (CIP), Rwanda 2020 Vision .

i. **Impact Assessment (IA)**

In its broadest sense, impact assessment is the process of identifying the anticipated or actual impacts of a development intervention, on those social, economic and environmental factors which the intervention is designed to affect or may inadvertently affect. It may take place before approval of an intervention (*ex ante*), after completion (*ex post*), or at any stage in between. *Ex ante* assessment forecasts potential impacts as part of the planning, design and approval of an intervention. *Ex post* assessment identifies actual impacts during and after implementation, to enable corrective action to be taken if necessary, and to provide information for improving the design of future interventions (IAIA, 2009). Following are some types of impact assessment:

ii. **Environmental Impact assessment (EIA)**

It is defined as a systematic process to identify, predict and evaluate the environmental effects of proposed actions and projects. This process is applied prior to major decisions and commitments being made, and particular attention is given in EIA practice to preventing, mitigating and offsetting the significant adverse effects of proposed undertakings (Erocal D.,1991).

iii. **Socio-Economic Impact Assessment (SEIA)**

It examines how a proposed development will change the lives of current and future residents of a community (Colombo,A.G,1992). The indicators used to measure the potential socio-economic impacts of a development include the following:

- Changes in community **demographics**;
- Results of retail/service and housing **market analyses**;

- Demand for **public services**;
- Changes in **employment** and **income levels**; and
- Changes in the **aesthetic quality** of the community.

Quantitative measurement of such factors is an important component of the socio-economic impact assessment. At the same time, the perceptions of community members about how a proposed development will affect their lives is a critical part of the assessment and should contribute to any decision to move ahead with a project. In fact, gaining an understanding of community values and concerns is an important first step in conducting a socio-economic impact assessment. The socio-economic impacts of a proposed development on a community may actually begin the day the project is proposed. Changes in social structure and inter-actions among community members may occur once the new development is pro-posed to the community. In addition, real, measurable and often significant effects on the human environment can begin to take place as soon as there are changes in social or economic conditions. From the time of the earliest announcement of a pending policy change or development project, attitudes toward the project are formed, interest groups and other coalitions prepare strategies, speculators may lock up potentially important properties, and politicians can maneuver for position (Kooten, 1993).

iv. **One Village One Product (OVOP)** approach

It is a community centered and demand driven ; regional economic development approach which originated in Japan in Oita in the 1970's. It is a unique approach to local development by which villages and regions are transformed into economically vibrant entities through utilization of local potential (i.e. resources) and creation of unique and appealing local products and environments. A particular Village (or region) chooses a product for which it has comparative advantage and specializes in its production through adding value (processing), quality control and marketing. The OVOP philosophy is about helping enterprises in a local area or region to focus on a product such as wine/jam or industry such as leather/weaving which is distinctive to that area. The OVOP institution helps the business owners to make their products competitive in local and international markets by contributing skills, money, technology and networks while drawing on numerous service providers to accomplish this (JICA, 1998).

v. **Green revolution**

It is the improvement of yields in Asian, Middle and South American countries through the use of new technologies in the agricultural sector (William Gaud, 1968). This term is used also to define such approach in sub Saharan countries.

vi. **Decentralization**

In Rwanda , the National Decentralization Policy is based on the Government of Rwanda's commitment to empower its people to determine their own future. The policy also has its foundations in the fundamental laws of the country as well as in the political and administrative reforms the government has already implemented. The objectives of Rwandan decentralization are to enable local people's participation; transparency and accountability; sensitivity and responsiveness of public administration, sustainable capacity development at local level, effectiveness and efficiency in the delivery of services (MINALOC, 2007).

vii. **Crop intensification program (CIP)**

To address the falling trend in productivity of crops and the minimal use and low availability of fertilizer in the country, the Government of Rwanda embarked on a plan to improve productivity and increase fertilizer availability through the Crop Intensification Programme (CIP) (MINAGRI, 2007).

viii. **Land consolidation and land reform policies**

They are synergies between the current agricultural policies towards green revolution and the changes in land ownership and distribution derived from the land organic law. They imply the current regionalization of products through land consolidation in an environmental friendly way to ensure sustainable development of rural livelihoods and the country in general in the context of EDPRS, 2020 Vision and MDGs targets achievement.

ix. **Strategic plan for the transformation of agriculture (SPATII)**

It is the agriculture Sectorial approach for implementation of EDPRS towards to achievement of Vision 2020 targets/objectives. It serves to elaborate and develop the programmes, sub-programmes and activities that lead agricultural development, and so guide implementation as well as forming the basis for a Sector-Wide Approach (SWAp) in agriculture (MINAGRI, 2009).

x. **Economic Development and Poverty Eradication Strategy (EDPRS)**

Rwanda's Economic Development and Poverty Reduction Strategy (EDPRS) is both a document and a process. As a document, the EDPRS sets out the country's objectives, priorities and major policies for a five years period (2008-2012). It provides a road map for government, development partners, the Private Sector and civil society and indicates where Rwanda wants to go, what it needs to do to get there, how it is going to do it, what the journey is going to cost and how it will be financed (MINECOFIN, 2007).

xi. **Rwanda 2020 Vision**

The Vision 2020 is a Government of Rwanda development/planning tool which seeks to fundamentally transform Rwanda into a middle-income country by the year 2020. This requires achieving annual per capita income of US\$ 900 (US\$ 290 today), a poverty rate of 30% (64% today) and an average life expectancy of 55 years (49 years today) (MINECOFIN, 2000). It aims at in short term at stabilizing the economy, reducing aid dependency and developing exports will be vital; in the medium term at transforming from an agrarian to a knowledge-based economy and in long term at creating a productive middle class and fostering entrepreneurship.

2.2 Overview of the agricultural sector

Agriculture is practiced on different types of land, including land of marginal quality and steep slopes. Agricultural systems in Rwanda are characterized by small family farms with an average size of 0.76 hectare which integrate polyculture and animal production systems. They are highly labour intensive since the cultivation techniques are purely manual (NISR, 2009). However, the household's arable land is becoming smaller due to the high population density combined with soil erosion. According to Agricultural, Livestock and Land Use Survey (Nkezabahizi et al., 2005), the soil fertility is declining due to a decline in the number of livestock causing scarcity of manure and compost. This increases the poor people's vulnerability and only a few agricultural households have the opportunity to raise their incomes by being engaged in off-farm activities. The practices of land renting and share-cropping exist: on average 10.7 percent of farmland is rented in form of cash or kind (Nkezabahizi et al., 2005). However, the consequence is that people would not make long-term investments where land is being rented. About 97 percent

Rwandan agriculture depends on rainfall. According to FAO (2005), only 8.9 percent of the arable area is irrigated. The suitability of most land in Rwanda for irrigation, given her terrain, is a major constraint, but there could be some good pockets where irrigation could be practiced.

Beans and sweet potatoes are the staples of the Rwandan diet and are cultivated everywhere in the country. Irish potatoes, sorghum, bananas and maize are grown in the majority of the rural communities, with regional patterns being apparent in some cases.

The majority of the total food production (66%) is for family consumption, but surpluses are marketed. However, not all households are able to sell their agricultural produce (only 60.3 percent can do so). Crops marketed by smallholders include bananas, potatoes, sorghum, beans, peas and maize which constitute the major sources of cash income for rural households (Nkezabahizi et al., 2005). Other crops most likely to be sold are coffee, tea and pyrethrum. These perennial export crops are cultivated on 13 percent of the arable land. Recently, there is an emerging diversification with products such as maracuja (passion fruit) and plums developed by private enterprises that process the fruit into juices and horticultural products (tomatoes and other vegetables) that supply an increasing urban demand. With regard to agricultural infrastructure, 91 percent of rural communities have a road leading to the community, but in more than a third of cases this is inaccessible for parts of the year (3.4 months on average). Only 14.8 percent of the communities have a weekly or daily market, and the average distance to the market is 4.6 km. Lack of access to markets acts as a serious constraint on developing more commercialized agriculture (Nkezabahizi et al., 2005).

The agriculture sector also is affected by high soil erosion and nutrient loss. Meanwhile efforts have been made by all agriculture stakeholders to solve this problem. The Government is aggressively pursuing measures for soil erosion control (terracing, increasing soil cover and integrated management approaches such as agro-forestry and zero grazing) (MINAGRI, 2009). Below is the situation of soil erosion/nutrient loss control for 2008 and 2009.

Table 1: Area under agriculture which underwent protection measures

No	Measure	Quantity	Year	
1	Land protected against soil erosion	45%	2008	
		50%	2009	
2	Marshland developed for Agriculture use	12,000 ha	2008	
		14,000 ha	2009	
3	Increase of land irrigated	15,000 ha (1%)	2008	
		24,000 ha (1.6%)	2009	
4	Irrigated hillside area	130 ha	2006	
		1,100 ha	2012	
5	Use of improved farm methods			
		Chemical fertilizer	15%	2008
			18%	2009
		Organic fertilizer	10%	2008
6	Livestock in intensive systems			
			13%	2009
			30%	2008
			38%	2009

Source: MINAGRI (2009)

Despite the above constraints, agriculture remains the main source of income in rural areas.

2.3 Coffee production in Rwanda

Coffee has been grown in Rwanda since its introduction by German Missionaries in 1904. The crop was mainly kept by the colonial administration to respond to the need for coffee that they cherished but also to support the economy of the country. Coffee growing was then made compulsory and the number of coffee producers grew progressively and consequently, the number of coffee trees and the plantation area considerably increased. In 1998, coffee production occupied around 6.3 percent of the total cultivated land (OCIR, 1998). Meanwhile as production increased, private operators started setting up coffee processing factories.

Rwanda produces *Arabica* coffee of *bourbon* and *typica* species. In general, the coffee tree grows well and gives a sufficient production in regions with altitude between 1400 and 1900 meters, rainfall between 1500 and 1600 mm, temperature between 18 ° C and 22° C and soils with acidity levels (pH) between 4.5 and 6, which are fertile, fragile and quite permeable (MINAGRI, 2004). Even though coffee is interspersed in all parts of the country, regions of suitability to its cultivation were identified relative to the above characteristics (OCIR 1998). For instance the shores of Lake Kivu in the Western province of the country are suitable for coffee growing with very good productivity. The rich volcanic soils, rainfall distribution and clement yearlong temperatures favour the slow maturation of the coffee bean which is good for the coffee taste. The productivity per hectare varies between 1100 and 1600 kg of dry coffee. In general, the central and

southern areas are moderately suitable for coffee growing with the yield varying from 200 to 900 kg of dry coffee per hectare. The highland region in the Northern Province is unsuitable for coffee because of very low temperatures. The lowland region of the eastern province is also not suitable for coffee growing due to insufficient rainfall and longer dry season; the soil fertility is too low for the coffee crop (OCIR 1998, MINAGRI, 2004). Mulch, manure and sometimes chemical fertilizer are used to maintain soil fertility. Coffee is harvested between the months of March and July (MINAGRI, 2004).

Almost all produced coffee is exported as its domestic consumption is quite low. The high volume importers include European countries France, Switzerland and Belgium, USA and Asia (OCIR, 2005). However, there is a problem of reduction in coffee prices on the international market maintained on a low level due to overproduction of coffee in countries like Brazil and Vietnam. Since the competitiveness of Rwanda coffee is being based solely on the price, the consequences of the fall in the market price have had a huge impact on Rwandan coffee sector. As the evolution of price paid to the producer in comparison with prices at the international market ; Rwandan coffee producers continue to receive very low prices (OCIR, 2005).

In attempt to face this price fluctuation challenge, the government of Rwanda initiated a coffee development strategy based on increasing production for economies of scale but also emphasizing on quality through the fully washed coffee program (Murekezi A., 2003). The value addition enables producers to maximize their income generation at also stages of the value chain. Today it contributes at 50% of the total volume of Rwandan export (NISR, 2011).

CHAPTER III: RESEARCH METHODOLOGY

3.0 Introduction

This chapter describes methods used in research study. It includes the description of research design and data collection procedures and measuring tools of impact indicators. It also describes the way in which data were analyzed.

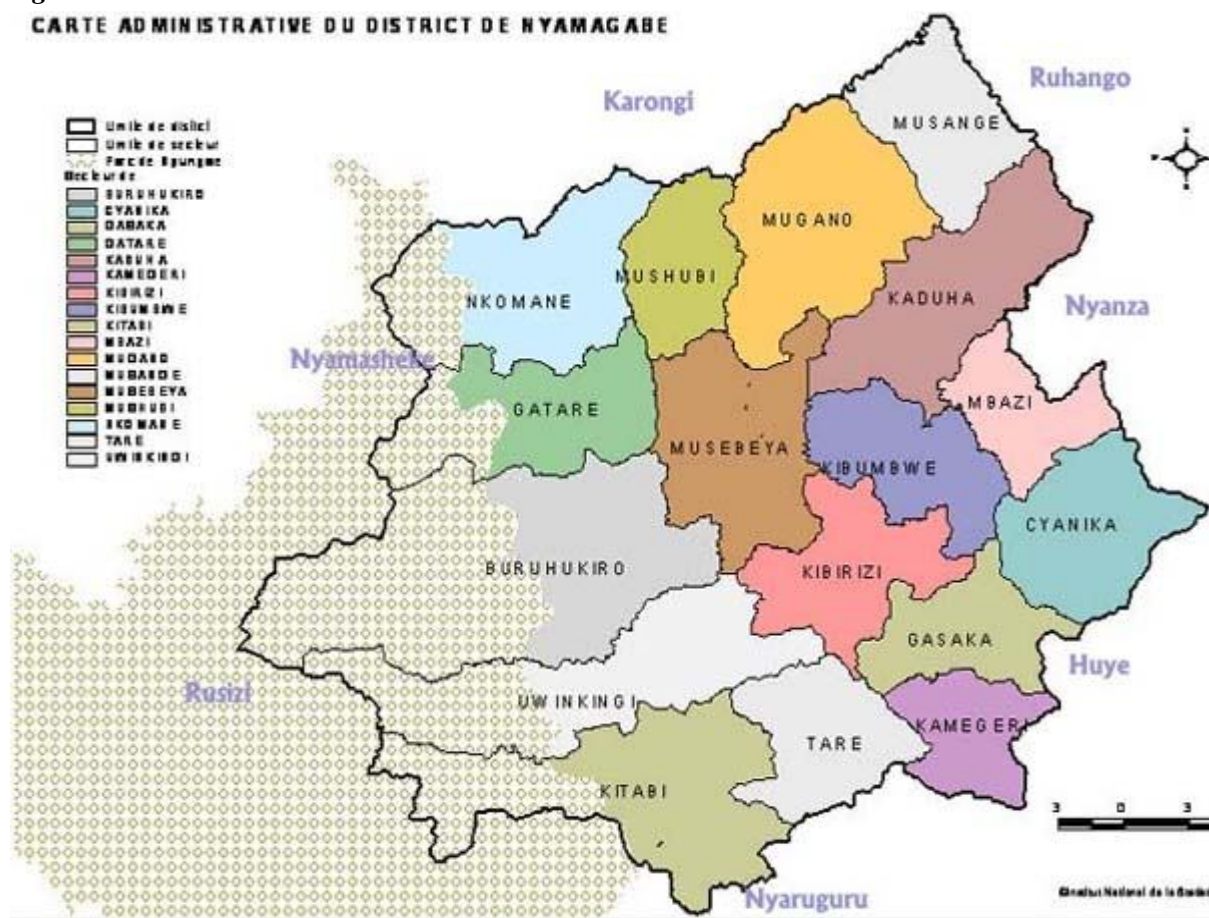
3.1 Description of the Study area and materials

3.1.1 Description of Nyamagabe district

Nyamagabe is a district (Akarere) in South Province, Rwanda. Its capital is Nyamagabe city. The district lies between Huye and Rusizi in the south-west of Rwanda, and contains much of the former Gikongoro Province, which was disbanded due to administration reform in 2006. It also contains the eastern half of Nyungwe Forest, a popular tourist destination, being one of the last remaining forest areas of Rwanda and home to chimpanzees and many other species of primate. Nyamagabe district is divided into 17 sectors (imirenge), 92 Cells and 536 Villages (Imidugudu) with a population of 317 766.

The following figure1 shows the administrative map of Nyamagabe District:

Figure 1 : Carte Administrative du district De NYAMAGABE



Source : DDP Nyamagabe, 2007

3.1.2 Land use consolidation through One village One product (OVOP) approach in Nyamagabe

The One village one product in Nyamagabe district had been implemented/adopted through the Coffee Intensification project in Nyamagabe for poverty eradication which is spread on 4 villages of Nzega cell, Gasaka sector with 253 households and with a target of 112 hectares. The main population is 219 households which participate at all project component(coffee growing, maintenance and get monthly subsidy for food expenses). However it is not easy to carry out a study/research covering the whole population. In this study, sampling procedures were used to select the units representing the population/target group. The sampling consisted in choosing households involved in this coffee intensification project from all 4 villages (among the 219 main household) and further representatives of the 34 households that do not get food subsidy thus they are not involved at all stages of the project.

3.1.3 Description of the project's planned major activities

Main activities which were planned for the project are the following:

- Preliminary studies and funds mobilization for the smooth start of the project. This is a major component for the project because all details concerning investment to be made, feasibility, EIA, identification of beneficiaries, projections and various plans are given;
- Preparation of 112ha on consolidated land consisting in digging holes, preparation of shrubs and replacement of crops by coffee plants. Setting of composts, erosion control contours, planting of mulching plants and forages, terracing;
- Organization, training and technical support to the cooperative of producers, Training on cooperative management, organization and sensitization on participation on various development activities;
- Financial, technical and advisory support to beneficiary households by a subsidy fund for 3 years and later set up a coffee washing station; reinforcement of a loan/saving spirit. Small project to be support for diversification;
- Project management, follow up, monitoring and evaluation consisting in maintaining the coffee plots, mulching, fertilizing, exploiting associated crops for the first 2 years, the management of the subsidy fund, harvest, construction of CWS, marketing/selling of production and project activities ownership towards sustainability (Nyamagabe district, 2009).

The following figure 2 presents the project site and its physical environment.

Figure 2: Project site and physical environment



Source: Study results, 2011

3.1.4 Biophysical data of the site

The site is located near the road Kigali-Huye-Nyamagabe-Rusizi and it is in Gasaka sector where the former Gikongoro town is located thus an important selling and supply marketing point for the population. Gasaka sector is among the principal coffee zones in Nyamagabe district and the plots qualify for agro ecological ideal(favourable) conditions for coffee cultivation: acidic and sandy soil; tropical humid temperate climate with sufficient rainfall (1300-1500 mm) and average temperature of 18⁰C; high altitude favourable for production of an exceptional quality coffee; the flora are composed of herbs, trees, seasonal crops (beans, Irish potatoes, Taro, sweet potatoes, cassava, peas, maize, sorghum, banana, etc...).

Actually, the predominant crop is coffee; while the fauna is composed of cows, goats, sheep, pigs, chicken, rats, lezards and small microorganisms and the relief is hilly with strong slopes.

Figure 3: Plots where coffee is grown in land use consolidation approach



Source: Study results

3.2 Research design

This study adopts survey research design to assess the socio-economic impact and field observation to assess environmental impact of the coffee Intensification project in Nyamagabe District, Gasaka sector in Nzega cell . The population size is 253 households that are payed monthly as a tradeoff for living subsidy for their participation in the the One village one product approach and that started the project with a target of growing coffee on 112 hectares in consolidated land.

In addition to survey, informal interviews with beneficiary farmers/households, local authorities, various development partners and researchers were organized and focused on analyzing the current situation, the situation at the start of the project and projection for the future.

For the choice of the sample size we shall use the Yamane Taro (1967) technique; which stipulates that for a given population, the sample size is found in relation with the degree of precision (confidential interval) needed.

For our case considering the 219 households which participate in all components of the project; the following formula allowed to obtain the sample size as follows:

$$n = \frac{N}{N(e)^2 + 1} \quad \text{N: population size}$$

n: sample size e=precision error

In our case, considering a precision error of 5%, then :

$$n = 219 / (1 + 219 * (0,05)^2)$$

$$= 141,5 \approx 142$$

N=Population size; e= precision error, n=simple size

Thus our sample was made of 142 households beneficiary of the coffee intensification project in Kamashya, Nyamisave, Kadoma and Kigarama hills of Kadoma and Gitantu villages, Nzega cell, Gasaka sector in Nyamagabe district.

The following table shows the distribution of the sampling design

Table 2: Sampling Design

Village	Subsidized Households	Non subsidized households	TOTAL
Kadoma	30	3	33
Kamashya	21	2	23
Kigarama	45	5	50
Nyamisave	46	5	51
TOTAL	142	15	157

Source: Study Results, 2011

For the fixation of the households to be interviewed in every village, we used a randomly stratified sample based on the proportion of household from every village and distributed questionnaires. As the population is homogeneous, we hope that informations are sufficient and adapted to the group of 157 households in two villages of Nzega cell in Gasaka sector of Nyamagabe district with 30 households in Kadoma, 21 households in Kamashya, 45 in Kigarama and 46 in Nyamasave. From the 34 non subsidized households we took 3 households in Kadoma, 2 in kamashya, 5 in Kigarama and 5 in Nyamisave. In addition we interviewed 6 non beneficiary households in project zone; 7 beneficiary household of a similar project in Kamegeri and 7 household outside the project area to compare the existing situation of the project beneficiaries with the rest of the population. Local administration and technical professionals in Nyamagabe district and development partners were contacted to get informations.

3.2 Sources of data

The source of data are informations collected on the field, discussion with stakeholders, documentation on both the project and other related topics.

3.3 Tool for Environmental Impact Assessment (EIA) and Socio Economic Impact Assessment (SEIA)

The Environmental Impact Assessment (EIA) of the project will be based on the comparative analysis of the Environmental Management Plan (EMP) and elaborated in 2010 by Nyamagabe district. This tends to find out its implementation process with observation done on field. This EMP is presented in the table below:

Table 3: Comparative analysis of the Environmental Management Plan (EMP) implementation

	Risk	Mitigation measure	Indicator	Timeframe	Responsible
1	Non respect of regulation framework ; unrealistic budget previsions and appropriate studies	<p>Ensure that various studies cover a large range on which legal and institutional framework of the project is concerned</p> <p>Ensure rational budgetary prevision and its availability for the project execution during its life cycle</p>	<p>Studies approved</p> <p>Certificates/authorization delivered</p> <p>Budget availed and sufficient enough to run the project to its completion</p>	<p>Before the project implementation</p> <p>Before the project implementation</p>	<p>Nyamagabe</p> <p>District</p> <p>PAGOR</p> <p>RDB</p> <p>REMA</p> <p>Nyamagabe</p> <p>District</p>

					PAGOR MINAGRI (NAEB)
2	Project refusal by the local population	Mobilization and sensitization, insurance for the better outcomes of the project to the beneficiary households; Implication of the beneficiaries in decision making process and ensure the integration of the project activities in the context of various development policies/strategies in the country.	Availability of fields Implication of local population in project implementation activities Regrouping into a cooperative structure The project is in line with one or several development policies	The whole project cycle (before and during implementation)	Nyamagabe District Local population Nyamagabe district and PAGOR
3	Loss of food crops, forests and grazing space for targeted households	Beneficiary households get a monthly subvention based on their size to enable them supplement in food commodities for the 3 years of the project cycle. Forests and grazing spaces are replaced by new vegetal cover	The subsidy is distributed to beneficiary households monthly and regularly; The food selling point (shop) is launched and functional	The 3 years of the project cycle 1 st year of the project	Nyamagabe district and PAGOR Nyamagabe district, PAGOR and KOKA

		<p>composed of coffee, fruits trees, forages and agroforestry species;</p> <p>Integration of food crops (beans, irish potatoes)</p>	<p>Coffee, fruits, agroforestry trees and forages are planted</p> <p>Food crops are grown with coffee for the first two years</p>	<p>1st year of the project</p> <p>1st and 2nd year of the project</p>	<p>Nyamagabe district, beneficiaries and PAGOR</p> <p>Nyamagabe district and beneficiaries</p>
4	Used water and wastes for the coffee washing station	Their treatment to be subject of an appropriate EIA before the construction of CWS	EIA for coffee washing station done	3 rd year of the project before mass production of coffee	Nyamagabe district PAGOR KOKA
5	Soil erosion thus nutrient depletion caused by rainfall in	Erosion control measures by erosion contour, terraces, mulching,	Anti erosion contour and terraces are	1 st year of the project	Nyamagabe district,

	coffee plantation	planting of fixing species, fruits agroforestry trees	set up or improved Agroforestry and fruits trees, Mulching and fixing plants are put in place		PAGOR, Beneficiaries
6	Inappropriate coffee plantation and maintenance techniques ; use of inefficient or non productive/resistant coffee varieties	Regular follow up and continuous training by agronomists and experts; Appropriate resistant and productive varieties for the region availed by OCIR-Café (NAEB); Beneficiary households use the monthly subsidy for maintaining coffee blocks;	Agronomists are available and facilitated Resistant and productive coffee varieties are availed for planting Coffee plantations are maintained by beneficiary households under the supervision of the cooperative.	The whole project cycle During planting and replacement The whole project cycle period (3 years)	Nyamagabe district PAGOR KOKA OCIR Café (NAEB) Nyamagabe district OCIR Café (NAEB) ISAR (RAB) PAGOR, Nyamagabe district, KOKA,

					Beneficiaries
7	Lack of birth control, emergency of Sexual transmission diseases (STD) and HIV Aids due to the proximity of people working mostly in plantations and also to the increase in incomes	Mobilization for family planning; Sensitization campaign to be organized for the fight against HIV Aids and prevention of STD ;	Mobilization done and measures taken Sensitization and people become more conscious and aware about HIV and STD prevention	The whole project cycle	Nyamagabe district KOKA PAGOR
8	Water and air pollution due to use of chemicals	Use of organic fertilizers (manure, compost, green, etc) by distribution of livestock;	Reduced use of mineral fertilizers Availability of organic manures, mulching and green manure	The whole project cycle	PAGOR Nyamagabe district KOKA beneficiaries
9	Destruction of coffee plantation due to few income, prices fluctuations, change of approach/priorities and competitive crops/producers	Ensure that the choice of coffee is integrated in a long term development planning; Production of much coffee and of quality, competitive on local and international market; Encourage off farms / tertiary income generating activities to serve as alternatives in case coffee	Integration of the project in the development policies (land consolidation, PSTAIL, EDPRS, Vision 2020, etc...) Organize farmers organization and preparation for coffee market ventures in locally and internationally Identification and introduction of off farms activities that generates	The beginning of the project The whole project cycle	Nyamagabe district Nyamagabe district, PAGOR, KOKA

		do not provide safety/ sufficient income to the population	incomes		Nyamagabe district, PAGOR, KOKA
				The whole project cycle	
10	Social conflicts to occur from the start of the project, management of subsidy support (at household and cooperative levels), management of food shop and the CWS once constructed	Mobilize the beneficiary households on the role of women in common/management of their households; Train the cooperative on organization, structure, objectives, conflict management, etc...	Women play a role in management of project activities and households as well especially in allocating the subsidy The cooperative is trained on various topics (conflict management, organization, management, etc...)	The whole project cycle	Nyamagabe district, PAGOR, KOKA, Beneficiaries
11	Lack of donors and development partners to cover financial and technical needs for the project	Strong mobilization and sensitization of donors and development partners; Ownership of the project activities by the GoR, its agencies, projects, institutions, to avail necessary	Donors mobilized		Nyamagabe district

		funds and resources needed to sustain the project and ensure its replication to other regions	Government institutions get ownership on the project activities	Beginning of the project up to the completion	
12	Lack of viable technical monitoring and follow up	<p>Ensure a permanent availability of agronomist; agri inputs, materials and equipments that farmers need:</p> <p>To ensure that this project becomes a priority for the district, MINAGRI, NAEB, RDB because of its integration in various government policies</p>	<p>Inputs and technical support available all over</p> <p>Farmers get basic knowledge in coffee maintenance, pruning, harvesting, etc...</p> <p>Project activities become an interest for MINAGRI, NAEB and RDB due its potential</p>	The whole project life cycle	<p>Nyamagabe district</p> <p>NAEB</p> <p>KOKA</p> <p>Nyamagabe district</p> <p>NAEB</p> <p>KOKA</p>

13	Displacement of the households/population to Built up areas (Umudugudu)	Setting up of resettlement on appropriate sites enabling people to get access to basic services	The population is relocated in grouping settlement	1 st and 2 nd of the project	Nyamagabe district
14	Lack of food commodities due to diminution of production of the neighbouring regions source of supply. This can cause malnutrition and project abandonment by the population	Capacity reinforcement/building of the beneficiary cooperative (KOKA) Prevision of harvest and food prices evolution on market to serve better the farmers involved in the project Use the guaranty fund to have food store to provide during time of crisis (non availability on market)	Creation of a security fund from the monthly subsidy; Organization and competitiveness of KOKA; The existing and future potential in food crop production is done on time; The food security store is set up	The whole project cycle	Nyamagabe district, PAGR, KOKA Nyamagabe district Nyamagabe district, PAGOR, KOKA

Source: (Nyamagabe district , 2010)

The Socio economic impact assessment (SEIA), will be done through a comparative analysis of the project achievements' progress with its logical framework as elaborated by the district in March 2009. The following table 4 presents that project logical framework:

Table 4: Logical Framework for Coffee intensification project in Nyamagabe district

Narrative Description	Objectively verifiable indicators (OVI)	Sources of verification/assumptions
<p>Overall objective: Poverty alleviation</p> <p>Sectorial objective: increase of the level of household incomes</p>	<p>The annual income of the beneficiary households is 8 times between the 3rd and 5th year. Passing from 100 US\$ to 986 us\$ in 2014</p>	<p>MINECOFIN and OCIR-CAFE (NAEB) reports</p>
<p>Specific objectives : Increase of coffee production (both quantitative and qualitative)</p>	<p>Yield on the consolidated land coffee blocks goes from 3 kg of cherries/tree in 2012 up to 8 kg in 2015 (160% increase)</p>	<p>Annual reports from OCIR-CAFE (NAEB) reports</p>
<p>Results : 1. Creation of coffee block on consolidated lands in NYAMAGABE District, GASAKA sector, NZEGA cell</p>	<p>112 ha of coffee plantations in consolidated land are set up in KADOMA and GITANTU villages</p>	<p>Regular reports</p>

<p>2. Creation of a cooperative regrouping 6 groups involved in the coffee intensification on consolidated land</p>	<p>1 new coffee farmers cooperative (Gasaka Coffee Producers Cooperative : GACOPC) is created all along the coffee blocks</p>	<ul style="list-style-type: none"> - Legal status delivered to the cooperative - Sector and district authorities delivers a certificate for the cooperative and its groupings
<p>3. coffee farmers are trained on a number of topics (cooperative management and coffee cultivation, maintenance and production techniques,...)</p>	<ul style="list-style-type: none"> - 30 lead farmers are trained on 7 modules (2 days/1module) and all groupings members get the same package (content) - 30 lead Trainers are trained on modern coffee cultivation techniques in 7 modules - 30 technical forms produced, simplified and distributed to lead farmers trainers - 7 modules on cooperative management Product - 7 modules on coffee cultivation, maintenance techniques 	<p>30 Farmers trained</p> <p>30 technical forms produced</p> <p>7 Modules produced</p> <p>7 modules produced</p>

4. Coffee farmers in groups are followed up closely	<ul style="list-style-type: none"> - 6 coffee extensionists are trained to ensure the monitoring and follow up of the coffee in field - A cooperative agronomist is recruited and provide technical and advisory support 	Monthly, and annual progressive reports
5. Agricultural techniques are largely applied on coffee consolidated blocks for their intensification	<ul style="list-style-type: none"> - Mulching is applied 100% from the 2nd year - The rate of organic manure use (application) reaches 90% at the end of 2nd year 	<p>Project report</p> <p>Guaranty fund available for easy access to small loans to get livestock and finance micro projects</p>
6. The village settlement are set up on the site where coffee consolidated blocks are located	228 plots delimited, prepared and constructed at the end of the 1 st year	<p>Project report</p> <p>Resources for construction materials available and delimitation done</p>
7. A subsidy fund is put in place to enable coffee farmers improve their livelihoods, access loans for other income generating projects for poverty reduction in waiting for first production/harvest 9 because all space is consolidated and coffee grown	<ul style="list-style-type: none"> - Every household gets 30,000 RwF as monthly subsidy - At least 100 introduced in the cooperative before March/2010 - 1 store for food commodity before August/2009 - A mutual assistance fund to be functional by July/2009 ; 	Project Report

8. Construction of coffee washing station (CWS) to process all the coffee cherries from the consolidated coffee blocks (plantations)	<ul style="list-style-type: none"> - A technical and financial feasibility study of the CWS is available by the end of the second year (2011) - A coffee washing station owned by the cooperative and having a capacity of 400T of parchment coffee is built and functional at the 3rd year (2012) 	<p>Project Reports</p> <p>OCIR CAFÉ (NAEB) reports</p>
I. A coffee consolidated block of 112 ha is set up in GASAKA sector, NZEGA cell		
1.1 production of plants in nursery and their transportation to the site	280.000 coffee plants are distributed up to March/2009	Monitoring and OCIR Café reports and resources available
1.2 Inventory, identification and delimitation of plots and mapping of the site	112 ha consolidated plots in GITANTU and KADOMA villages	<p>District reports</p> <p>District authority sensitize local population to adopt the project</p>
1.3 Marking and digging of holes where coffee will be planted	280.000 holes marked and dug before April/2009	<p>Project report</p> <p>District financing the activities with the help of beneficiaries</p>
1.4 Transfer of plants from nursery to different hills of the site	280.000 plants are transferred until end march-2009	<p>Project report</p> <p>District support available for beneficiaries</p>

<p>1.5 Lay out, arrange the site for water and soil conservation on the whole watershed</p>	<ul style="list-style-type: none"> - 1.400 erosion contours totaling 28.000 m³ of volume are marked and dug - 200 water collectors holes and 1000 fascines are built - 1.120.000 grafts/plants of fixing herbs species (Temedá, Tripsacum, Pennisetum, Setaria) and 360.000 plants of Agroforestry trees (Grevillea robusta Cassia spectabilis, Calliandra,...) are planted to fix erosion control contours and produce biomass for mulching and animal feeding ,forage. - 112 ha of consolidated coffee plots are cultivated and maintained, 200 composts of 6 m³ of volume each are constructed by end May/2009 latest 	<p>Project reports</p>
<p>II. Create, reinforce a cooperative of 6 groups of 228 coffee farmers exploiting the consolidated plots</p>		
<p>2.1 Put in place small groups of coffee farmers based on the delimitation of hills to facilitate follow</p>	<ul style="list-style-type: none"> - 6 groups of 39 coffee farmers each are organized - a certificate of existence is delivered to the groups by the sector 	<p>Project report</p> <p>Sector Report. The agronomist and the district mobilize the local population to adhere to the project</p>

<p>2.2 Put in place a cooperative and proceed to election of its leadership</p>	<ul style="list-style-type: none"> - 1 general constitutive assembly held - 1 executive committee of the cooperative composed by 9 persons is functional - A status and internal regulation order, (IRO) signed 	<ul style="list-style-type: none"> - Minutes - cooperative report - project report - Official Recognition of the cooperative
<p>2.3 Train coffee farmers member of the cooperative on a number of topics regarding cooperative management and improved agricultural techniques</p>	<ul style="list-style-type: none"> - Training plan availed - 30 lead farmers selected - 4 trainers recruited - 7 modules on cooperative organisation and management produced - 30 copies of modules on cooperative management and 30 copies of technical modules and 30 forms on improved production techniques of coffee shared in the cooperative - 5 lead farmers/trainers are trained and conduct the training of other coffee farmers for 14 days/module 	<ul style="list-style-type: none"> - Service provision contracts are signed for the training of lead farmers Availability of funds - project report
<p>2.4 Follow up, accompany and monitoring of coffee farmers groups</p>	<ul style="list-style-type: none"> - 6 coffee extensionists trained then recruited to ensure the proximity monitoring of farmers - 3 field visits of technical supervision by the district technical team 	<ul style="list-style-type: none"> - Project report Contracts with coffee extensionist weekly reports for the monitoring

III. Technical, organizational and financial support for the coffee farmers cooperative		
3.1 Avail, mobilize a subsidy fund to reduce poverty effects of beneficiary households for 3 years		
Support the farmers in waiting for the first harvest/production	30.000 RwF/months allocated to every household starting by March-2009	Project and Partners´ reports Development Partners (PAGOR) support the district in this project
Set up a food commodity and other articles of basic needs store project managed by the cooperative to reduce prices and enable to buy on credit	1 food commodity store is functional before August/2009 Contribution of 2.000 RwF /household at the reception of first subsidy to raise an operational fund for the store-shop and get a loan contract at BPR Nyamagabe signed by the cooperative	Project report Bank report Beneficiary household accept to contribute in a mutual guaranty fund
Launch a milking cow project to diversify income sources and manure production for field fertilization	Initial 100 cows to be introduced in the cooperative	Project report Some projects intervening in the area supporting the project and beneficiaries supporting a guaranty fund with expected 38,000,000 RwF at the end of the project

Initiate a saving and credit scheme through mutual approach IKIMINA to get access to micro credits for small income generating projects	An initial fund of 912.000 RwF raised on the basis of the subsidy fund by 4,000 RwF/household/month	Cooperative and project reports Beneficiary households are sensitized and trained
Exploit/Valorise the coffee interlines for production of high yield crops such as irish potatoes	250 T of irish potatoes seeds 250 T of lime 2000 T organic manure 25 T mineral fertilizers NPK 17.17.17 9360 kg of Dithane M45 available by September - October 2009	Project reports BPR sa Nyamagabe to support the project Beneficiaries contribute Partnership with other stakeholders (RADA/RAB)
Create a built up areas near the consolidated plots to facilitate easy access to infrastructures and free plots/field to grow coffee	228 houses built with good materials and achieved before May 2010	Project report Partners support the initiative
Support the cooperative at organizational and technical level	Organize training and study tours	Project and cooperative reports
Prepare monthly plan of activities	1 monthly plan of activities is available from June 2009	Project report Support from the recruited agronomist and the district

Provide project reports	1 monthly report 1 annual report	Project report Support from the recruited agronomist and the district
Supervision of meetings and restitution of reports	1 monthly meeting organized and supervised 1 annual meeting organized and supervised	Minutes of the meetings Support from the recruited agronomist and the district
Realize a technical and financial study for the construction and exploitation of a coffee washing station near the consolidated blocks	1 feasibility study is available by May/2011 The construction of the coffee washing station of 400T parched coffee is complete by March/2012	Project and cooperative reports Support from the recruited agronomist and the district
Evaluation of the project	1 evaluation report is available	Project report Support from the recruited agronomist and the district

Source: Nyamagabe district, 2009

3.4 Methods of data collection

In facilitating the study to be well accomplished, each objective of the study has been investigated/analyzed using specific questions/observation. The tools of data collection like questionnaires, interviews, documentary analysis was carefully used to reflect the basic features and implementation strategies of land consolidation measures combined with crop intensification for this particular project of coffee intensification project in Nyamagabe district.

3.5 Data processing

Data processing refers to the transformations of respondents views into meaningful form (Kakooza;1996). Normally data collected from respondents is in a raw form, which is not easy to interpret and analyze to make conclusions. This concerns the editing, tabulation, hypothesis testing and study limitation.

Results of the study in terms of area cultivated , household membership, income during the bridge period, use of extension services and technology adoption, current agriculture production, land ownership, settlement issues, are discussed and presented in comparative tables of environmental management plan and the logical framework of the project.

Quantitative Data were analyzed using Microsoft Excell and compiled together with qualitative data to the baseline targets of the projects for an impact assessment. Results from discussion and interviews held with various key partners of the projects were inserted to fill the gap of missing informations and enrich the content of the study.

Quantitative and qualitative data of the project will be also compared and discussed against the project Logical Frame. A table in which the project achievements and observations vis à vis the Logical framework will be presented.

Finally a summarized table describing all identified current challenges/constraints of the project and their eventual mitigation measures will be presented and will serve as tool/support for elaborating recommendations and conclusion of this study.

CHAPTER IV: EMPIRICAL RESULTS

4.1 Socio Economic Impacts

4.1.1 Characteristics of respondents

The coffee intensification project for poverty reduction in Nyamagabe district which was initially piloted in Nzega cell of Gasaka sector is influenced by human factors such as : age of households head, number of households members, gender issue and education level. The following table 5 describes the project beneficiaries and non subsidies households in terms of age and sex of households head

Table 5: Presentation of the respondents by sex and age

Village	Sex		AGE			
	Male	Female	21-30 years	31-40 years	41-50 years	≥50 years
Kamashya	17	6	4	7	5	7
Kadoma	23	10	6	11	7	9
Kigarama	36	14	10	15	12	13
Nyamisave	38	13	9	16	12	14
TOTAL	114	43	29	49	36	43

Source: Study results, 2011

The above table shows that 27,4% of households in the sample size are headed by women and that people over 50 years are at the same rate. This affect the project activities because women have other households responsibilities and do not find enough time for coffee maintenance, pruning and the aged people (≥ 50) are not very active expect when they have an additional family labour. The following table 6 describes the membership in the households involved in the project.

Table 6: Presentation of household membership of the respondents

Village	Household membership				TOTAL
	1-2 people	3-4 people	5-7 people	8-10 people	
Kamashya	4	9	8	2	23
Kadoma	5	13	12	3	33
Kigarama	8	17	15	10	50
Nyamisave	9	20	18	4	51
TOTAL	26	59	53	19	157

Source: Study Results, 2011

For the implementation of the project, the district considered that farmers were growing various food crops prior to embrace the One village one product approach. In waiting for the exploitation phase of the projects which consists in selling coffee from their fields; a monthly living subsidy was proposed to ensure the coverage of basic food needs of beneficiary households.

The subsidy for food expenses and coffee maintenance is based on the number of people living in a households (25,000 RwF for ≤ 4 members and 30,000 RwF for ≥ 5 members). The total number of people living in the 157 respondent households is 698 (369 women and 329 men). Among them, 142 get the living subsidy. Generally this subsidy they get is much superior to the incomes they used to get before the project implementation but the households in category ≤ 4 (3-4 people) and others of the category ≥ 5 people have expressed their concerns that the subsidy do not fully cover food expenses and coffee maintenance activities (labour, pruning, mulching, fertilizer, etc...).

Some households have few members but have a large area of coffee to be maintained although they get less subsidy while others have much members but with a least area of coffee which leads to a redundant labour. The following tables 7 and 8 will present the level of education and employment for the project beneficiaries

Table 7: Presentation of the respondent by level of education

Village	None	Primary	Post primary	Secondary	TOTAL
Kamashya	3	13	5	2	23
Kadoma	5	18	7	3	33
Kigarama	7	28	11	4	50
Nyamisave	7	29	11	4	51
TOTAL	22	88	34	13	157

Source: Study results, 2011

The level of education influences the way people can adopt and understand and participate easily in new development policies. This project implicates prevision, budgeting, participation in training, management of the beneficiaries organisation (KOKA cooperative), etc... all those activities requires a minimum package of writing and counting skills. However the selection of project beneficiaries was done randomly considering only the willingness of people to join the coffee project in OVOP approach.

Table 8: Presentation of employment for the project beneficiaries

Village	Teacher	Nurse	Private employee	Other Government employee	Farmer	TOTAL
Kamashya	1	0	4	1	17	23
Kadoma	2	0	5	1	25	33
Kigarama	3	1	7	1	38	50
Nyamisave	2	1	8	1	39	51
TOTAL	8	2	24	4	119	157

Source: Study results, 2011

The majority of the population in the project (75.6%) live solely of agriculture and they rely on the food subsidy during the 3 year period to meet their needs. Those who are employed both by the government institutions and private sector get salary and continue to grow coffee. They get a better of as they can rely on two sources of income.

4.1.2 Coffee Intensification in Nyamagabe district achievements

Preliminary phase: activities enabled a good planning of activities, analysis of alternatives and set up of clear objectives and targets; the Conformity to laws/regulations, mobilization of resources, stakeholders and partners consisted in identifying beneficiaries, project elaboration setting up of objectives, partnership. However some negative impacts occurred such as the implementation of the project before carrying out some key studies such EIA thus leading to a lack of budgetary provision for aspects of the project . There was also a lack of feasibility study and clear strategy for

implementation and replication of the project. This affected negatively the project activities/implementation process.

Phase of preparation of land and plantation of coffee trees: during this phase, the activities focused on valorizing 90,9 ha of field and hills which were in general not exploited; planting of 207,935 coffee trees; setting up and maintenance of soil conservation measures such as progressive terraces (1137 erosion contours totaling 22725 m³ were established). Intensive labour was used, land use consolidation introduced in the region and a spirit of agricultural professionalization using organic fertilizers reinforced. 65 new households planted coffee for the first time and 92 others reinforced their existing plantation or extended them. The following table 9 illustrates the situation of planted coffee during the project life cycle and the situation at the beginning.

Table 9: Presentation of coffee planted before and during the project

Village	<2009	2009-2010	2011	Total	Households that planted coffee with OVOP	Households that planted coffee before OVOP	Area (<2009) in ha	Area (2009-2011) in ha
Kamashya	1002	6022	11187	18211	9	14	0,8	7,4
Kadoma	16366	38942	20931	76239	12	21	8,3	32,7
Kigarama	11465	28320	40335	80120	21	29	6,5	36,1
Nyamisave	4093	13236	16036	33365	23	28	2	14,7
TOTAL	32926	86520	88489	207935	65	92	17,6	90,9

Source: Study Results, 2011

Meanwhile there are serious concerns and stumbling blocks which affected the project and the beneficiary population during this phase. These are include: the loss of food crops by the local population and the delay in getting subsidy; non planned planting which did not respect appropriate time and lead to a loss of plants thus a need for replanting or replacement. Even though the number of coffee cultivated area and coffee trees increased by 5 and 6 respectively (from 17,6ha to 90,9 ha and from 32326 trees to 207935 trees); the planned 112ha were not totally planted and the expected 280,000 coffee plants were not reached; insufficient erosion control measures with a persistent loss of soils; and planting of coffee trees was not accompanied by the planting of forages and mulching plants nor general integration of other crops such as irish potatoes to maximize use and minimize project adoption risks. Today the beneficiaries face a problem of finding mulch for coffee trees or forages for newly acquired livestock.

Phase of exploitation and project management: the mulching, pruning and weeding of coffee plantations is done day by day. Beneficiaries use family labor, community work (divided into groups and work on rotational basis) or hire labor using the monthly subsidy they get

The planting of forages, fruits trees and mulching plants have not so far been done as planned and this leads to a shortage in their supply and farmers have to buy which is an extra cost in their production process.

The households involved in the project were grouped into a cooperative called KOKA (Koperative Kawa Ndatwa) which coordinates their activities. It ensures that farmers maintain well their plantations, manage the food shop/store (comptoir de vente) which sells food and other commodity to farmers and they pay back after getting the subsidy. The executive committee, members and staff of the cooperative were trained on cooperative management and agricultural techniques/practices. However, there are some problems which need consideration like the non maintenance of some coffee plots due to lack of labour, operation cost, non availability of owners and space. The subsidy is allocated based on the size of the family and not on the cultivated area. This leads to a difference of means for maintaining the plots and leave some abandoned. The overexploitation of soil nutrient as the supplement in manure, soil cover and fertilizers are not sufficient and erosion resulting from lack of sufficient soil cover plants, efficient soil conservation measures and agroforestry trees along the project site. Generally the coffee trees planted before the project continues to produce in waiting for the early production of project coffee trees in 2012 season. The following table 10 gives the analysis of the coffee production and selling against its cost for the last 12 months .

Table 10: Production, selling and production cost of coffee in the project area for the last 12 months and 2012 production prevision

Village	Production in kg (2011)	Income (RwF)	Inputs (RwF)	Maintenance (RwF)	Net income (RwF)	Production in kg (2012)
Kamashya	3091	772793	116550	1776000	-1119758	18146
Kadoma	52535	13133715	515025	7848000	4770690	142101
Kigarama	41045	10261175	568575	8664000	1028600	117508
Nyamisave	15758	3939513	231525	3528000	179988	52818
TOTAL	112429	28107195	1431675	21816000	4859520	330573

Source: Study Results, 2011

From this table we observe that the average production of cherry coffee is 3kg/tree while the total production is expected to increase by 3 times in 2012 as the first coffee planted in the project context get into production. The inputs concern the cost incurred to get fertilizer, acquire labor for pruning, mulching and weeding in coffee plantation.

The 2011 price for cherry coffee was 300 RwF/kg of at the Coffee Washing Station (CWS). As there is no coffee washing station in the area, the price included transportation/collection cost to a nearby CWS and the price was 250RwF/kg of cherry;

The production cost was insured by the subsidy given monthly to beneficiary households; its combination with revenues from selling of coffee. Households with various income resources or with much incomes hire labour from others to work on their coffee plantations. However some vulnerable household with old people or less means to maintain their plantations need a supplementary support and a close follow up.

The project planned the identification of other activities complementary to coffee. These small income generating projects has to be financed from the monthly contribution of 5,000 RwF that every households contribute monthly to constitute a mutual guaranty fund and enable them to make saving and get access to small loans.

Among those activities the district in collaboration with its development partner PAGOR, key funder of this project, provided support for livestock to 104 households. They are expected to contribute in improving livelihoods of beneficiaries and create opportunities of alternative sources of income. The following table 11 shows the distribution of livestock in the project area.

Table 11: Livestock distribution in project area

Village	LIVESTOCK						TOTAL (RwF)
	Support for cows		Support for Pigs		Support for rabbits		
	Number	Amount (RwF)	Number	Amount (RwF)	Number	Amount (RwF)	
Kamashya	2	1000000	18	1170000			2170000
Nyamisave	1	500000	30	1950000	3	150000	2600000
Kigarama	5	2500000	26	1690000	2	100000	4290000
Kadoma	3	1500000	12	780000	2	100000	2380000
TOTAL	11	5500000	86	5590000	7	350000	11440000

Source: Study results, 2011

Even though land use consolidation in OVOP context focus on the production of one crop, it was observed that despite a strong mobilization, farmers continued to exploit their land in growing other crops such as beans, sweet potatoes, irish potatoes and banana. This was mainly done in hiring plots in other villages, associating those crops with coffee and by integration for the 1st year when this was acceptable. Those employed as teachers, nurses, government or private staff get a extra income to meet their household needs or fill the gap left by insufficient subsidy. The following tables 12 and 13 shows the production of other crops than coffee and income from them and other activities.

Table 12: The production of other crops

Village	Beans (tons)	Sweet potatoes (tons)	Irish potatoes (tons)	Banana (tons)
Kamashya	3,6	10,8	8,2	1,2
Kadoma	2,9	11,4	6,9	0,9
Kigarama	3,2	8,2	8,8	0,9
Nyamisave	2,5	12,3	7,4	0,8
Total (tons)	12,3	42,7	31,2	3,7

Source: Study results, 2011

Table 13: Income from other crops and activities

Village	Beans	Sweet potatoes	Irish potatoes	Banana	Other	TOTAL
Kamashya	900000	785000	1250000	175000	1800000	4910000
Kadoma	720000	835000	1050000	125000	2100000	4830000
Kigarama	800000	600000	1350000	135000	2720000	5605000
Nyamisave	625000	900000	1125000	115000	2880000	5645000
TOTAL	3045000	3120000	4775000	550000	9500000	20990000

Source: Study results, 2011

This is an estimated value of the total production of those crops at the local price (247RwF/kg of beans, 147RwF/kg of banana, 153RwF/kg of irish potatoes and 73/RwF of sweet potatoes).

4.1.3 Cost benefit analysis in the project area

The analysis of the costs and benefits in the project area is based on the incomes from selling of cherry coffee, other crops and subsidy for food expenses against the total investment/production cost and other expenses incurred by the households. This enables to have a picture of the net income for households to be used in daily expenses (food, education, health insurance, housing, etc.). The following table 14 presents off farm

expenses by the households. They generally concern children education, health, communication, clothing, etc...

Table 14: Annual off farm expenses per household

Village	Food	Water&electricity	Communication	Other needs	TOTAL	ANNUAL/Household
Kamashya	4784000	69000	552000	2760000	10166000	442000
Kadoma	6534000	82500	690000	2484000	13305000	403182
Kigarama	7800000	75000	720000	3300000	16520000	330400
Nyamisave	9180000	51000	765000	4896000	20941000	410608
TOTAL	28298000	277500	2727000	13440000	60932000	388102

Source: Study results, 2011

The following Table 15 present the summary of incomes for households involved in the project of Coffee Intensification for Poverty Reduction in Nyamagabe district, Gasaka sector, Nzega cell, in four villages.

Table 15: Summary of income

Village	Households	Subsidy (RwF)	Income from coffee	Other income	Average income/household
Kamashya	23	7480000	-1119758	4910000	490011
Kadoma	33	9140000	4770690	4830000	567900
Kigarama	50	15200000	1028600	5605000	436672
Nyamisave	51	15640000	179988	5645000	420882
TOTAL	157	47460000	4859520	20990000	466940

Source: Study results, 2011.

Considering the total number of 157 household and an annual income of 466,940 RwF thus 38912 RwF as a monthly income for household. The annual income per household is 778USD/year at 600RwF/1USD rate. This is superior to 100USD/year in 2009 at the beginning of the project. The differential contribution of the project in terms of income is 678 USD/year.

Using the approach of Cost benefit Analysis criteria

NPV = Net Present Value = $B^* - C^* > 0$ and **B/C ratio = Benefits : Costs = $B^* / C^* > 1$**

IRR = Internal rate of return = that interest (discount) rate at which $B^* = C^*$

The cost and benefit analysis of the project is done by comparing both tables 12 and 13 (annual expenses and income respectively). This comparison is illustrated in table 16.

Table 16: Cost benefit analysis of the project (annual)

Village	Benefits (B) in RwF	Costs (C) in Rwanda	NPV	B/C ratio	IRR
Kamashya	490011	442000	48011	1,11	3,5%
Kadoma	567900	403182	164718	1,41	
Kigarama	436672	330400	106272	1,32	
Nyamisave	420882	410608	10274	1,02	
VARIANCE	466940	388102	78838	1.2	

Source : Results analysis, 2011

With an average of annual expense of 388102 RwF/household and an average of annual income of 466,940 RwF/household, the difference thus the annual net income is 78,838 RwF/household. This is composed of the 5,000 RwF that every household obligatory saves from its monthly subsidy and other small saving by household with much more sources of income. The viability of this project will thus rely on the coffee production and processing and rational investment of the household savings into more profitable income generating small projects.

4.2 Comparative analysis of Environmental Management Plan (EMP) implementation

This section seeks to find out how the project implementation/achievements are related to its environmental management plan which was approved in early 2011. The risks, mitigation measures, time frame, indicators and responsibilities are in the basic environmental document while the study's contribution is given as observation/achievement showing the progress or state of the element. Considering the table ... above, following are the achievements, challenges and perspectives as environmental impacts deriving from the implementation/execution of the coffee project are the following:

The project is integrated in Government of Rwanda (GoR)'s development policies and other partners are interested in its replication. This project is in conformity with government policies such as land consolidation, CIP, PSTAI, GIRINKA, EDPRS, Vision 2020 and MDGs. The project responds positively to development priorities and policies of the country. The Government institutions such as NAEB and Nyamagabe district have put the project activities under their priority for extension and other districts such as Huye got interested for replication.

Fields were availed for the project and the coffee is planted on 90,9 ha instead of the planned 112 ha. The population was involved in field preparation, coffee plantation and maintenance. Coffee were planted sometimes without planting calendar respect which

lead to a loss of several plants. Forages and fruits trees have not been grown at an appreciable level. Irish potatoes beans and soya beans were grown for the first two years. Today they are grown in hired fields outside the project area. Families that have large plantations but with least number of members get insufficient subsidy and this do not cover all expected expenses in the households. Many coffee field are not well maintained and around 20% need an immediate attention due to their quasi abandonment. The need for family planning became a must as the project projections don't change as the population increase. Extension officer from NAEB, the district and sector agronomist together with the cooperative agronomist assist farmers. Planting materials were provided by OCIR/Café (NAEB) and adapted to the region as proved by ISAR (RAB) research. The mulching , animal manure and fixing plant are used to reduce dependency on chemicals.

The beneficiaries are organized in Cooperative KOKA (Koperative Kawa Ndatwa) and the cooperative shop for food commodity exists and is owned by the beneficiaries' cooperative. Further its management needs a close follow up/control. The KOKA cooperative has got various training and made tours to other coffee cooperative to assess the way coffee business is done. The budget for 3 first years was availed. However there is a need of one supplementary year to ensure that farmers starts to get significant incomes from coffee selling. The subsidy is available however it did not come timely when the project started and its current regularity low. The cooperative has got a number of trainings and also many studies were done to strengthen its capacity. The KOKA cooperatives ensures the supply of the food commodity to its members through the food shop and they pay on a monthly basis deducting from the subsidy. However the prices within the cooperative shop are higher than the common market, there is a need of minimizing its expenses so that it can be competitive with the local food market otherwise coffee growers may be discouraged

EIA for CWS not yet done but preliminary visit and contacts to get funds/loan to build the CWS are on way. Anti erosion contour and terraces were done but are not well maintained. Some agroforestry species, fruits, mulching, fixing and forages plants are in place but are not sufficient nor planted in a technically intensive way for ease of complementarities and alternatives. People are aware of the HIV and STD consequences and ways for prevention.

The 2011 prices were attractive as the price for cherries was doubled compared to 2010 (from 150RwF to 300RwF). A number of project mainly based on livestock have been identified and initiated. Women are involved at all levels of decision in the project as they co-sign on bank account for the living subsidy.

The beneficiaries have not been relocated to settlement. This caused the fact that there are households in middle of coffee plantation. It does not facilitate an large scale production and mind set.

4.5 Comparative analysis of the project logical framework

This analysis focus on the progress of the project logical framework implementation. It seeks to assess the level at which the objectives of the project have been reached and will enable to make conclusion and recommendation accordingly.

Table 17: Comparative Analysis of the project Logical Framework

No	Achievements	Observation
1	Annual income for the beneficiaries is 820US\$ conspiring all sources of income.	Generally the project support 219 households with an average of 5 people membership with a monthly subsidy of 25000RwF(≤ 4) and 35000RwF (≥ 5). 34 other households got support in planting but are not eligible for the monthly subsidy
2	The consolidated plots have not yet begun to produce	3 kg are expected for coffee which has been planted on time, pushed, replaced and not abandoned
3	90,9 ha of coffee plantations in consolidated land were set up in KADOMA, KAMASHYA, KIGARAMA and NYAMISAVE villages in NZEGA cell, GASAKA Sector, NYAMAGABE district	Around 20% of the planted coffee need a particular follow up as the owners have not taken care for maintenance. The district, sector and KOKA should find solution The replacement of the plants which did not grow is required
4	The cooperative was created (Koperative ya Kawa Ndatwa: KOKA) and has legal status	Membership is obligatory for beneficiaries of the subsidy. It deals with administrative and management issues, advocacy and monitor the coffee maintenance and plantation activities

5	<p>30 lead farmers were trained</p> <p>30 technical forms produced and were distributed to lead farmers</p> <p>7 modules were produced</p> <p>Not yet produced</p>	<p>Need further training on cooperative management and communication skills to be able to share with their counterparts</p> <p>Immediate measures to be taken so that farmers get sufficient training/basic knowledge in coffee plantation, maintenance, etc</p>
6	<p>Extensionists not yet trained/recruited</p> <p>The cooperative has recruited an agronomist who works closely with NAEB Extension Officer</p>	<p>Need of at least 4 extensionists to help the agronomist to follow up the coffee blocks maintenance</p>
7	<p>Terracing and planting were done properly but the mulching is not completely done on all block at the end of 2nd year</p> <p>Guaranty fund operational as household make monthly contribution of 5,000 RwF.</p> <p>Organic manure provided by distributed support for livestock (</p>	<p>Need more technical training and extension services for farmers;</p> <p>Operating mechanisms to be normalized</p>

	cows, rabbits and pigs).	The program should benefit to all households should benefit from this program too
8	Resources for construction not yet available and delimitation not yet done	It is important to handle this issue because land consolidation needs that people leave the plots free so that maintenance works may not be affected. The population will also have access to basic services easily
9	<p>Every household get 25,000 RWF (≤ 4 members) and 35,000 RWF (≥ 5 members)</p> <p>11 households got cows, 7 rabbits and 86 pigs</p> <p>1 store managed by KOKA is operational since 2009</p> <p>Mutual assistance fund is operational</p>	<p>Not sufficient for household with much coffee trees or cultivated area</p> <p>Adapted to the need and capacity of the households but took time (delayed) to reach beneficiaries (2011)</p> <p>The management of the cooperative shop is under the cooperative and particular follow needed</p> <p>Mutual assistance fund operational (10 households in a hill contributing 5000 Rwf monthly)</p>

10	<p>Financial feasibility was done in 2010</p> <p>Construction work not yet started</p>	<p>Technical studies should be initiated to anticipate the 3rd year where early planted coffee will start producing;</p> <p>The capacity will need a replication of the project to other villages which is being done by the district</p>
11	<p>Transportation and planting were done by the district in collaboration with TIG and total number of 207,935 coffee trees were planted</p>	<p>A number of coffee trees planted did not push well, replacement was done but it needs a regular check up.</p> <p>Actually 175009 coffee plants on 91 ha consolidated are well maintained and await to start production in 2012. They were only 32926 coffee plants at the start of the project thus an increase of 531%. Others did not grow well or the fields are not maintained</p>
12	<p>Identification and mapping done ; the beneficiary households were identified, sensitized and mobilized for the project</p>	<p>228 households were targeted; 219 responded</p> <p>34 others are involved but do not get monthly subsidy</p>
13	<p>The district contract TIG for this activity and 207935 holes were done</p>	<p>Plant calendar and effectiveness of the digging, terracing and planting were not quite satisfying due to delays in mobilizing resources and technical knowhow</p>
14	<p>The district contract TIG for this activity</p>	<p>Plant calendar and effectiveness of the digging, terracing and planting were not quite satisfying due to delays in mobilizing resources and technical knowhow. Between 60-70% grew perfectly thus a need of replanting</p>

15	<ul style="list-style-type: none"> - 1.136 erosion contours totaling 222.725 m³ of volume were marked and dug - 100 water collectors holes and 400 fascines were built - 320.000 grafts/plants of fixing herbs species (Temedá, Tripsacum, Pennisetum, Setaria) and 130.000 plants of Agroforestry trees (Grevillea robusta Cassia spectabilis, Calliandra,...) are planted to fix erosion control contours and produce biomass for mulching and animal feeding ,forage. - 90,9 ha of consolidated coffee plots are cultivated and maintained, 60 composts of 6 m³ of volume each were 	<ul style="list-style-type: none"> - Maintenance is very poor and appropriate measures need to be taken - the existing system should be reviewed and an emphasis be put on terracing and erosion control contours - the space/area is occupied by coffee and these plants need to be purchased. The budgeting constraints should be solved to ensure a better use of the coffee blocks <p>The delay in implementation lead to a disturbance in the project implementation/execution and is at the basis of recurrent problems</p>
16	<p>Existence of 4 groups of 53, 81,82 and 37 from the 4 villages of Nzega cell</p> <p>The local population was mobilized and sensitized by the district, PAGOR and OCIR CAFÉ (NAEB)</p>	<p>34 households don't benefit from the subsidy support</p> <p>Regular information sharing and training need for the famers to own the outcomes of the project in a sustainable way</p>
17	<p>Koperative Kawa Ndatwa (KOKA) was created and got legal status recognized by RCA</p>	<p>The executive committee and sub committees need much training in cooperative, project management in order to respond positively to the needs of the members</p>

18	<p>Training plan produced</p> <p>30 lead farmers were trained</p> <p>Trainers recruited and covered a number of topics</p> <p>30 technical forms produced and were distributed to lead farmers</p> <p>Not yet done</p>	<p>Need further training on cooperative management and communication skills to be able to share with their counterparts</p> <p>Immediate measures to be taken so that farmers get sufficient training/basic knowledge in coffee plantation, maintenance, etc...</p>
19	<p>1 cooperative agronomist assisted by NAEB extension officer and the sector/district agronomist and Regular visit are done</p>	<p>- need 4 extensionist to assist the cooperative agronomist</p>
20	<p>25,000 RwF/Months for households\leq4 and 35,000RwF for households\geq5members are disbursed for 219 households involved in the project</p>	<p>The subsidy should consider the size of plots</p> <p>The subsidy should go up to 4th year to enable the evaluation of the first coffee harvest/production</p>
21	<p>Beneficiary households contribute 5,000 RwF monthly for common project and running cost of the cooperative food commodity store</p>	<p>The food commodity store operational and some mutual support loan chains (tontine)is operational in different groups of the cooperative/project. A clear strategy for investment need to be set up</p>
22	<p>104 households got livestock support (11 for cows, 7 for</p>	<p>Support should go up to all households involved in the project and this should have been</p>

	<p>rabbits, 86 for pigs) by the support of PAGOR project</p> <p>Non guaranty fund as such but households organized a mutual assistance fund to enable them to finance small income generating projects</p>	<p>done earlier</p> <p>Follow up of this mutual assistance fund to avoid mismanagement or the use of resources for other cooperatives needs/purposes</p>
23	<p>This approach is being done in the four groups of the project in Nzega cell by contributing 5,000 RwF/monthly</p>	<p>The credit and saving spirit with mutual assistance fund/mutual guaranty fund to be a priority for training and sensitization so that farmers may get various sources of income in diversifying production projects</p>
24	<p>Soya beans project was initiated but did not produce enough</p> <p>Beneficiaries contribution is limited</p> <p>Partnership with other stakeholders not yet functional</p>	<p>The project started without prior preparation and resources were not availed timely to support the cultivation of interline crops for the 1st year</p> <p>The farmers did it on oneself basis and it did not generate much incomes as expected and the issue of fertilizer hampered the approach</p>
25	<p>Resources for construction not yet available and delimitation not yet done</p>	<p>It is important to handle this issue because land consolidation needs that people leave the plots free so that maintenance works may not be affected. The population will also have access to basic services easily</p>
26	<p>It is done by the cooperative secretary/accountant and the executive committee as they were trained on the matter</p>	<p>The organization of the cooperative and the training process took longer than planned.</p> <p>Report format/template are need</p>
27	<p>It is done by the cooperative secretary/accountant and the</p>	<p>The organization of the cooperative and the training process took longer than planned.</p>

	executive committee as they were trained on the matter	Report format/template are need
28	Regular meetings are held in accordance with the law of cooperative	Reduce the accuracy of meetings which reduce the cooperative resources
29	Financial feasibility was done in 2010 Construction work not yet started	Technical studies should be in initiated to anticipate the 3 rd year where early planted coffee will start producing; The capacity will need a replication of the project to other villages which is being done by the district
30	With the phasing out of PAGOR an evaluation report is being prepared. An evaluation report for management of KOKA cooperative and its food commodity store (shop) was done	In the project design they should have been a clear calendar and strategy for implementation Midterm study should have been done earlier (end of 2010) with clear deliverables to guide the revision process of the project

Source: Study results, 2011

4.4.6 Identification of main project challenges/constraints and their mitigation measures

Table 18: Analysis of negative impact and constraints/challenges

No	Negative impact, Constraint/challenges	Indicator	Observation mitigation measures (way forward)
1	The coffee trees planted and grown are still few compared to planned	Coffee scattered in field without proper spacing	Replacement or replanting of the coffee trees in the current cultivated area and proceed to extension and a good spacing (2500 coffee trees/ha)
2	Delayed grow of coffee trees because of organic manure not available	Non sufficient livestock distributed	To push for the livestock project to benefit to all involved 219 households
3	90,9 ha off new coffee plantations and 17,6ha of old plantation are not well maintained	Presence of shrubs, the plots and terraces are not well maintained and some plantation look like abandoned	Close follow up of how farmers take care of their coffee plots by the cooperative Takeover strategies by the district for abandoned fields or those whose owners don't stay in the area
4	Disturbance of the targeted households livelihoods relying on food market thus exposed to prices increase and food shortage	The only food source is the market/cooperative food commodity store(shop)	Diversification of income sources by creating off farm job activities
5	Losses due to diseases and pests, natural disaster/calamity affecting monoculture	Coffee pests and diseases attack coffee in consolidated plantations Disaster/calamities are unforeseen events	Encourage the reinforcement of other activities/projects which are not competitive to coffee cultivation Put in place an IPM strategy
6	Discouragement of farmers and loss of interest in OVOP approach	Irregularity of the living subsidy or its cease before farmers get significant production and sell to the market	Ensure that the subsidy is timely disbursed Find ways to finance the project up at least to 4 th year

7	Erosion and loss of soil nutrient	Soil conservation measures not in place Erosion control infrastructures not well maintained	Ensure soil cover, regular maintenance of terraces, cultivation of nitrogen fixing trees
8	Production loss due to lack of a coffee washing station to add value to coffee cherries thus easing conservation issues	The coffee washing station not installed before the first harvests	Accelerate the premises for setting up the coffee washing station
9	Coffee washing station likely to operate under capacity then causing bankruptcy	The coffee production is not enough to cover the operating capacity of the CWS Insufficient productivity of consolidated coffee	Replicate the project in neighboring villages to increase production and Set up strategies to increase yield to reach at list 500 tons of cherry coffee annually.
10	Lack of funds to invest in small income generating projects	No other projects are operating	Mobilize funds, train farmers, link them to microfinance institution, support the mutual assistance fund
11	Family conflict between men and women in managing the monthly subsidy	Conflicts arose within families disturbing the project activities or causing the misuse of the funds	Strong sensitization on gender equality issues Close follow up of beneficiaries to ensure total cooperation/involvement in the project
12	Discouragement of farmers due to coffee prices fluctuation on national and international market	Coffee prices reduced due to their external factors' dependency Marketing channels very costly	Diversification Emphasize on high quality coffee Reduce middlemen number
13	Lack of resources to set up village settlements	Village settlements not set up causing a misshape in the project approach of changing totally the current livelihoods	Engage various institutions and development partners to build modest housing for the households involved in the project to serve as model

14	Mismanagement of the cooperative and its resources affecting the project success and sustainability	Poor leadership, lack of lobbying and advocacy, mismanagement of funds, the food commodity store not delivering good services to its customers	Emphasis on cooperative management Regular follow up of cooperative activities by district authorities and RCA Auditing regular the shop and the cooperative
15	Lack of project ownership and follow up after PAGOR phase out thus no sustainability/durability of project achievements	Project activities abandoned in hand of unqualified cooperative members/households	Much trainings/coaching and slow phase out of the project Ownership by concerned institutions (NAEB, district, RCA, KOKA, SACCO, etc...)

Source: Study results, 2011.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The Coffee Intensification Project for Poverty Reduction in Gasaka sector of Nyamagabe district have come to support the district in its efforts to alleviate poverty within rural population through new income generating opportunities by developing high value added commercial crops.

The absence of land use consolidation in a context of land scarcity and excessive scattering combined with the lack of crop intensification in the area (GASAKA-NZEGA) was keeping the population in extreme poverty.

The lack of proximity follow up, investment and rural financing for coffee growers had been for longtime at the basis of their disinterest in developing commercial coffee production as coffee being a perennial crop generating after three years ; farmers opted for other seasonal food crops without economical outcomes but ensuring their subsistence.

This project enabled the implementation/adoption of land use consolidation policy, enhancing the value of the land by the cultivation of coffee blocks on 90,9 ha, adding to 17,6ha which existed before, with high marketing potential, introduction of mulching and nitrogen fixing species, forages; organization, proximity follow up, capacity reinforcement of the beneficiaries' organizational body (KOKA cooperative); the financial support in term of monthly subsidy to ensure food security of involved households ; and diversification through the development of small income generating projects associated or complementary to coffee growing to increase their incomes. With the 175009 new coffee trees ready for production in 2012 and the 32926 old coffee trees with a current capacity of 112T; it is expected that the consolidated land produce around 300T of coffee cherries thus a need for a washing station. All project interventions aimed at increasing the quantity and improve quality of coffee to be produced on consolidated blocks to generate incomes and reduce poverty in supported communities ensuring their sustainable development.

At the of the 2nd year this project, the achievements of the project had so far reached some of its objectives such as changing positively the rural livelihoods, increasing their

annual income, enhancing the value of the fields formerly unexploited, causing a new market oriented agricultural system, enabling an intensive production of various complementary activities (coffee and livestock); mutual assistance, arising credit and saving culture, strengthening the need for supporting soil conservation and erosion control measures, etc...

Therefore a number of negative impacts, challenges and constraints due to the project implementation have been observed. Their smooth, rational and timely handling as proposed will ensure the success and sustainability of this project and also other similar projects outcomes releasing the targeted population out of poverty and contributing to the development of the country in general.

Recommendations

Although the One Village One product: Coffee Intensification Project for Poverty Reduction in Nyamagabe district, Gasaka sector, Nzega cell has registered many good achievements in improving the local population in general and concerned households in particular livelihoods; a number of recommendations to come over identified bottlenecks, challenges, constraints are given below to be given a particular attention in ensuring the success of the project in reaching its objectives:

To Nyamagabe district:

- Ensure that the One village one product approach is well understood by the population through a massive mobilization, support to this model project and the beneficiary cooperative;
- Ensure that the concerned households get monthly food security subsidy and maintain the coffee fields;
- Regular monitoring/follow up of the KOKA cooperative activities and the management of the store in particular;
- Continue to mobilize development partners to support this project and especially extend the subsidy support up to 4th year;
- Support the KOKA cooperative in mobilizing resources to build coffee washing station (CWS) which is a pillar in the success and sustainability of the project;
- Provide regular technical support and follow up to the cooperative and farmers;
- Encourage the involvement of private investment in such projects;
- Ensure the extension of the project to other villages targeting to have enough production to meet the processing capacity of the CWS;
- Engage government institutions in charge of agriculture (RAB&NAEB) in the follow up and ownership of the project;
- Mobilize resources, sensitize the local population for living in Built up areas (Imidugudu) as a component of this kind projects;
- Sensitize the population for the maintenance and protection of soil conservation, erosion control, water harvesting facilities as well as other common development infrastructures.

To KOKA cooperative:

- make necessary efforts to prepare the future management of the project and its achievements;
- mobilize members in taking care, maintaining and adopting new technologies for their coffee plantations;
- follow up closely the engagement of the members in the project to avoid distortions and abandonment of coffee fields;
- ensure a good management of the food commodity store to serve better the interest of the coffee farmers in the project;
- diversify its source of incomes by organizing members in various income generating activities not competitive to coffee growing but complementary;
- set up a conflict resolution strategy to handle disputes likely to occur resulting in the management of the subsidy, income from coffee or other projects, land allocation, resources allocation in the cooperatives, mutual assistance fund, etc...
- make a strong lobbying and advocacy in the members interest and especially for the need of a supplementary subsidy support for the 4th year, the construction of a Coffee washing station and financing of small income generating project;
- be in line and update with cooperative, environment and other necessary laws and regulations;
- set up a good management, planning, monitoring, evaluation and auditing systems to ensure transparency and democracy within the cooperative
- integrate its activities in the government policies and development programs (Ubudehe, HIMO, Vision 2020 Umurenge, Kitchen garden, EDPRS, PSTAIL, Vision 2020)
- seek a regular capacity building of its members, executive committee, staff and put an emphasis in recruiting really qualified and competent staff.
- Work closely and setting up communication channels with government and private institutions involved in the project (Nyamagabe district, RAB, NAEB, other coffee cooperatives, projects, etc...)

To farmers beneficiaries of the project:

- To take care of coffee plantation by maintenance, regular mulching, pest control, weeding, fertilization;

- Participate actively in the cooperative activities;
- Be aware of their rights and responsibilities in the project;
- Avoid conflicts among themselves or entertaining activities which contravene with coffee growing;
- Bring their contribution in terms of labor and materials for coffee blocks maintenance, construction of houses in built up areas (Imidugudu);
- Follow up the management of the cooperatives, the food commodity store and further management of project outcomes;
- Use efficiently and adequately the subsidy to meet their needs and also invest in small income generating projects as identified.

To PAGOR project:

- Ensure that the pending needed support is availed on time;
- Ensure a smooth project phase out and take over by the cooperative and the district;
- Ensure that the training procedures manuals and modules are produced and given to KOKA cooperative;
- Carry out basic technical studies for the installation of a Coffee Wash station;
- Ensure that the documentation on /content of various studies done in relation with the current project are communicated to the cooperative and the district;
- Carry out an evaluation and a completion reports so that the project can be entirely assessed/analyzed and lessons learnt for future similar projects.

To the Government of Rwanda:

- Emphasize on land consolidation approach and elaborate a road map plan considering all features of rural livelihoods
- Close collaboration and clear responsibilities sharing between MINALOC (the district), MINAGRI (RAB and NAEB), MINERENA (REMA, RNRA) and development partners affiliated to government or independent/private.

“ Continuous monitoring and follow up, synergy between various interventions/stakeholders and mindset change will insure the success of the One village one product: Coffee Intensification project for poverty reduction in Nyamagabe district, Gasaka sector, Nzega cell.

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ANNEXES

Annex 1: Questionnaire to the beneficiary farmers of the project

Personal identification

1. Sex:

Male.....

Female.....

2. Age:

a) ≤ 20 years.....

b) 21-30 years.....

c) 31-40 years.....

d) 41-50 years.....

e) ≥ 50 years.....

3. Education level:

a) Primary level.....

b) Secondary level

c) Bachelors' degree

d) PhD/Masters' level.....

4. Main Occupation:

a) Teacher.....

b) Nurse

c) Private employed.....

- e) Other government employed.....
- f) Farmer.....
- g) Other Specify:.....

5. Number of household:

- a) 1-2 people.....
- b) 3-4 people.....
- c) 5-7 people.....
- d) 8-10 people.....
- e) ≥ 11 people.....

6. What is the surface area of your plot.....

7. What are the principal crops before OVOP.....

(Specify area occupied for each)

8. What are the principal off farm activities before OVOP.....

9. For how long have you been cultivating coffee?.....

10. When did you join coffee OVOP?.....

11. What is the number of coffee trees you own?.

Before OVOP.....

With OVOP.....

12. What are the income (monthly) of the household:

Before OVOP.....

After OVOP.....

13. What is the subsidy that your household get monthly?.....

14. What is/was the cost of planting your coffee

Time (man/days).....

Money.....

Land(ha).....

15. What are other crops are you growing now?.....

(Specify area covered and system)

15. What is/was the cost of maintaining coffee

Time.....

Money.....

Land.....

16. How was OVOP got known to you

-Extension officer.....

- Local Leader.....

- NGO..... Which one.....

Radio::..... Which one.....

TV..... Which one.....

17. Have you harvested coffee for the last 12 months?

Yes..... How much (kg).....

No.....

18. If yes (Q17) can you estimate the proportion of:

Coffee planted under OVOP.....

Coffee formerly cultivated (before OVOP).....

19. What was the income from selling coffee cherries?.....

20. What was the price for coffee cherry?.....

21. What have been incomes from other crops for the last 12months?.....

22. What have been the income from off farm activities?.....

23. Explain your daily time allocation?

Coffee maintenance.....

Household activities.....

Other agricultural activities.....

Other..... Specify.....

24. How do you get access to extension services?

Sector agronomist.....

Project agronomist.....

Cooperative agronomist.....

NAEB(ex-OCIR) Agronomist.....

Other..... Specify...

25. Where are you expecting to get market for coffee you will produce?.....

26. What are the channels you use for selling your production.....

27. How do you get food?

Own field.....

intercropping with coffee.....

Local market.....

Regional market.....

28. What are on average the monthly/quarterly/annual household expenses(in rwfs)?

- Education.....

- Health.....

- Food.....

- Water & electricity.....

- Casual workers.....

- Communication.....

- Other basic needs.....

29. What are the principal concerns to be considered in the future for you; your community, the region and the country for OVOP policy and this related coffee project in particular?

30. What are the principal: economical, social, environmental, cultural constraints/bottlenecks for this project?

31. What are the other income generating activities which can supplement coffee;

1.Cow 2. Pig 3.Poultry 4.Pig 5.Carpentry 6. Handcrafts 7.Other (Specify)

32. Considering the projection in production, marketing and other related activities rank the current performance. Future potentialities of the project.

33. How do you find the OVOP approach for yourself and the community in generalⁱ

1. Excellent 2. Good 3. Quite good 4. Bad 5. Non opinion

ⁱ 1 (very perfect and well planned); 2 (perfect bad needs rejustification) ;3 (good compared to what we had but not perfect); 4 (not responding to the needs of the population); 5 (a totally wrong policy to be abandoned).

Annex 2 : Content of interviews

The interviews will be centered on following questions:

- What are the reasons behind the introduction of the OVOP for coffee approach in Nyamagabe district;
- The planning, monitoring and evaluation processes for the project both on district side and supporting agencies as well;
- Share various data related to the project with various stakeholders especially (Nyamagabe district, PAGOR, PDCRE, RAB, etc...);
- Challenges, constraints, bottlenecks and opportunities for the coffee project in context of OVOP and way forward to make it socially, economically, environmentally, etc...friendly;
- Strategies set in place to resolve identified problems;
- Detailed information on social, economical and environmental issues of the project;
- Identification of complementary activities to support coffee exploitation.