
Climate Change: Strategies for Smallholder Farmers to achieve Food Security and Income Growth

CASE STUDIES FROM EASTERN AFRICA

In preparation for the Africa Forum 2010
Burkina Faso, October 2010

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Acronyms

ACE	Area Cooperative Enterprise
CAK	Cooperative Alliance of Kenya
EAFF	Eastern Africa Farmers' Federation
FO	Farmer Organizations
GDP	Gross Domestic Product
ICRAF	World Agro-forestry Centre
NUCAFE	National Union of Coffee Agribusinesses and Farmer Enterprises
SACCOS	Savings and Credit Cooperative Societies
TFC	Tanzania Federation of Cooperatives
UCA	Uganda Cooperative Alliance
UNFFE	Uganda National Farmers' Federation
WAFICOS	Walimi Fish Cooperative Society Ltd

PREAMBLE

These case studies have been prepared in preparation for the CAADP Africa Forum 2010, held in Ouagadougou Burkina Faso from October 4th to 8th 2010. The theme for the Africa Forum is “Meeting the Challenges of Climate Change: Strategies of Smallholder Farmers to achieve Food Security and Income Growth in Africa.” One of the objectives of the forum is to share cases from farmer organizations on what farmers are doing to address the challenges related to climate change. This document is a compilation of the some of the cases that were received from the member organizations of the Eastern Africa Farmers Federation. The cases cover the areas of livestock management, crop management, water and fisheries management.

LIVESTOCK MANAGEMENT STRATEGIES

Small dairy farms under irrigation, Djibouti (DBA)

About Djibouti

Djibouti is situated in the Horn of Africa. The country is divided into five main districts, three of which are situated along the coast of the Red Sea - Obock, Tadjourah and Djibouti city. The climate in this region is Mediterranean with the main rainy season occurring during the winter from November to April. The other two districts - Ali-Sabieh and Dikhil are located inland and have a continental climate, with the main rainy season occurring from June to September).

Djibouti is a semi arid country with an average annual rainfall of about 140 mm/year. This low level of rainfall is unsuitable for rain-fed crop agriculture. However agriculture under irrigation can thrive in areas where fresh underground water is available. Agriculture in Djibouti contributes only 3 % of the national GDP, compared to services and Industry that contribute 82% and 15% respectively.

Region/Province: Ambouli Oasis

The Ambouli Oasis is located in Djibouti city district. The oasis is a temporary river that channels all water from the watershed of the inner regions into the Red sea. The irrigated farms that provide fresh produce to the Djibouti market are situated along the banks of this river.

Description of the initiative: Irrigated dairy farms in Djibouti.

This is an on-going initiative which was started in the 1980's by the vegetables and fruits growers of the Ambouli Oasis area. Those peri-urban small dairy farmers converted their

land to grow grass and shrubs, which are more adapted to water salinity. The grasses and shrubs include Guinea grass, brachiarias, leuceaena and date trees.

The project was initiated by small-scale dairy farmers, and is entirely self-financed. Local banks are reluctant to engage in agricultural investment.

Brief presentation of the climate change challenges/issues faced by smallholder farmers before the initiative

Before the initiative, farmers were growing fresh vegetable and fruits for the local market. Due to climate change, the underground water has become brackish (salty) in most of the Djibouti coastal area where irrigated lands are situated, leading to a reduction in the productivity of the land. The sustainability of irrigated gardening is constrained due to the salinity of the water. The increasing level of water salinity reduces the productivity of the land, and therefore reduces the income of farmers. Progressively farmers shift from vegetables growing to zero grazing dairy farms. The farmers grow several types of grass and shrubs that can thrive in salty water such as Guinea grass, brachiarias sp, Leucaena leucocephala, and date trees. This new activity provides farmers with a daily cash flow through daily milk production and supply.



Photo 1: Guinea grass production under furrow irrigation

Along the coastal area where this initiative mainly takes place, it is easy to grow grasses and shrubs from October to May through irrigation. From June to end of September the weather is too hot, and the growth of animal feeds is not possible due to the high levels of evapo-transpiration. To compensate this lack of animal feed,

farmers import hay and cereal by-products from neighbouring countries.



This initiative has started in 1984 in the oasis area located close to the main market of the Djibouti capital. Animal breeders provide fresh meat and fresh milk to local market. Over the years, farmers have upgraded their local zebu cows by cross-breeding them with exotic Holstein bulls. This is intended to

increase their milk production. Later, farmers faced a problem of animal feed shortage caused due to the increased water.

This led farmers importing feeds from neighbouring countries (particularly from Ethiopia). However this was not only expensive, but also very erratic. The result was a negative impact on Djibouti's dairy farm economy.



Photo 2: Production of napier grass, buinea grass, lucerne and leucaena

The impact / effectiveness of the initiative on livelihoods

In the rural areas animal are reared under a nomadic pastoralist system, moving from place to place in search of water and feeds. In this system, the livestock are kept for both meat and dairy product for daily livelihood, but may also be sold in exchange for grain. When



Photo 3 Watering system for dairy cows

irrespective of the erratic weather conditions. Two, children from these households are able to attend school, as they are not burdened with water collection duties. This impact is longer term, but very critical.

nomads lose their livestock as a result of water shortages brought on by drought, they resort to cutting down trees for firewood and charcoal or they migrate to the cities and towns. The nomadic pastoralist system is very sensitive to climate change. The impact of the small dairy farmers irrigation project is two-fold:

One, farmers are able to receive a frequent income from the sale of milk,

“The decision to convert my land from fruits and vegetables production to dairy farm has been dictated by the prevailing changes in the climate. All the same I don't regret it. Despite difficulties, sales of milk and meat are more productive than fruits and vegetables sales”.

Dairy farmer in Djibouti

An assessment of the cost-effectiveness of the initiative:

The estimated cost of the initiative is USD 27,022 (of which USD 12,360 is the cost of land). The relevance of cost other items are likely to vary from country to country. There may also be substitutes for some of these items. The table below presents estimates from Djibouti.

Table 1: COST OF INITIAL INVESTMENT IN AGRICULTURE

Items	Nature of cost	Cost in Djibouti	Cost in USD ¹ \$
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¹ There is fixed currency between Djibouti Franc and the US Dollar: \$ 1 = 178 Djibouti Franc

		Franc	
1	Land purchase ²	2 200 000	12360
2	Clearing, levelling, and Planting	400 000	2247
3	Construction of two (2) hand dug wells	300 000	1685
4	Construction of cow sheds and mangers	300 000	1685
5	Purchase of 2 engine driven water pumps ³	350 000	1966
6	Construction of Farmers Cottage	250 000	1405
7	Purchase of 5 Cross-Bred cows	640 000	3596
8	Fencing and Storage area	300 000	1685
9	Hand Tools	70 000	393
10	Total	4.810.000	27,022

How participatory is the initiative? What is the role of stakeholders (e.g. Farmers, FOs, others)? Who drives the process?

The key driver for the success of this initiative is the demand for fresh milk and fresh meat in the local market, and the availability of imported animal feed (hay and by products) mainly from Ethiopia. But now, with the shortage of animal feed at local market, all stakeholders, including farmers, farmer organizations, government, and civil society are involved in seeking for solutions.

Can this initiative be easily replicated to another region or country? Is the technology transferable or adaptable to context and circumstances? What are the main conditions or success factors for replicability?

The initiative could be easily replicated where there is enough water for irrigation and where

² 1 hectare land costs average 2 200 000 FD.

³ Driven water pumps of 2 inches pipe diameter

there is a great demand for animal products.

The main conditions are:

- Access to land: Farmers need land to undertake the project
- Training: (i) On animal feeding techniques and the types of grass to be grown in an area (ii) on how to handle exotics dairy animals

Contact details

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Promotion de L'élevage en Stabulation Permanente, Rwanda (IMBARAGA)

PAYS: RWANDA

PROVINCE: PROVINCE DU NORD

INITIATEUR: MINAGRI

SOUTENUE PAR: FEDERATION IMBARAGA ET AUTRES OP, PROJETS

1. Contexte

L'élevage traditionnel (extensif) conduit à la pauvreté des pâturages et à la dégradation de l'environnement par le piétinement et la destruction par broutage de certaines espèces fourragères et finalement entraîne l'augmentation de l'érosion et la désertification.

Dans le cas du Rwanda, ce problème est très préoccupant étant donné que la superficie moyenne des terres cultivables par ménage dépasse rarement un demi-hectare (0,5ha) et que c'est sur ce lopin de terre qu'un ménage de 6 personnes doit cultiver et élever les animaux.

Vu cette situation, les organisations paysannes dont IMBARAGA se sont fortement impliquées dans la promotion du système d'élevage en stabulation permanente qui joue un rôle important dans l'atténuation des changements climatiques et pour assurer la sécurité alimentaire des petits exploitants.



Elevage extensif (pratique traditionnelle)

2. Description de l'initiative

Au Rwanda, l'élevage en stabulation permanente a commencé à être vulgarisé depuis les années 1988. Ce système d'exploitation consiste à construire une étable fumière où l'animal reste en permanence jour et nuit. Il est nourri de fourrage provenant des champs fourragers (Pennisetum,.....) et des haies anti-érosives (Setaria, Calliandre...) avec un apport d'aliments concentrés quand les moyens financiers et les conditions du marché le permettent.

Les accessoires de cette étable sont la compostière avec deux fosses dont une fosse fumière et une à purin ; toutes les deux couvertes de toitures en matériaux locaux pour limiter l'évaporation.

Tous les déchets de l'étable sont récupérés dans ces fosses et une fois décomposés ils se transforment en matière organique qui est utilisée pour la fertilisation des champs.



Elevage en stabulation permanente (nouvelle initiative)

3. Efficacité de l'initiative sur le changement climatique

- Eviter le surpâturage qui cause la nudité du sol et favorise l'érosion ;
- Diminuer l'évaporation des eaux du sol (dessèchement du sol) ;
- Favoriser la couverture végétale (par l'utilisation de la fumure organique) du sol et ainsi lutter contre l'érosion ;
- Produire l'énergie (biogaz) utilisée dans les ménages en remplacement des bois de chauffage. Soulignons que la déforestation est aggravée par la recherche du bois de chauffage utilisé par la majorité de la population habitant en milieu rural.

Parmi la production de l'animal domestique, la bouse sert à la conservation et la fertilisation du sol à une valeur hautement considérable car elle a la propriété de retenir le sol et des matières organiques du sol comme étant un liant, et par conséquent diminuer voire même arrêter l'érosion. Le sol fumé et non fumé sont extrêmement différents en termes de capacité de résistance à l'érosion.

4. Efficacité de l'élevage en stabulation permanente sur la sécurité alimentaire

- La production de lait s'est multipliée par 5 car l'animal est bien nourri et logé ;
- La croissance de l'animal est accélérée ;
- La production agricole s'est multipliée au moins par 3 grâce à l'utilisation de la quantité suffisante de la matière organique ;
- L'élevage en stabulation permanente assure la sécurité alimentaire mais également la santé de l'animal car il reste à l'abri des épidémies et autres dangers et le contrôle de son état de santé est facile. Cela étant, la production est assurée sur une longue durée ;
- Les frais de gardiennage sont réduits.

5. Evaluation du rapport coût- efficacité de l'élevage en stabulation permanente

Si on compare les deux systèmes d'exploitation, l'élevage traditionnel avec tous ses inconvénients économique-environnementaux et l'élevage en stabulation permanente avec tous ses avantages (voire efficacité ci-dessus) par rapport aux changements climatiques, la sécurité alimentaire et l'augmentation des revenus des ménages des petits exploitants, le coût de cette initiative n'est pas élevé. Seulement 100 à 200 Dollars peuvent être suffisants pour construire une étable et ses accessoires.

6. Rôle des principaux acteurs Impliqués

Les principaux acteurs impliqués dans ce système d'exploitation sont :

- Les organisations paysannes dont IMBARAGA, INGABO, qui font un travail de sensibilisation, formation, et de vulgarisation agricole (extension). Le nombre de bétail distribué sous forme de crédit remboursable en nature est évalué à 2500 têtes ;
- Les banques et Institutions de microfinance qui accordent des crédits ;
- Le gouvernement Rwandais à travers ses politiques et programmes de développement agricole soutient ce système et le projet « one cow one family » vient de donner sous forme de crédit en nature plus de 1000 vaches dans la province du Nord.

7. Contribution des bénéficiaires

Deux catégories d'acteurs tirent profit de ce système. Il s'agit des éleveurs (50%) qui viennent de changer leurs système d'exploitation en abandonnant le système traditionnel. Dans la majorité des cas, la contribution de l'éleveur bénéficiaire qui possède un animal est de 100%. Chaque année, le nombre de nouveaux éleveurs qui adoptent cette nouvelle pratique est évalué à 10% au moins.

8. Possibilités d'extension de l'initiative

Ce système d'exploitation est facilement reproduit dans d'autres régions. L'exemple en est que cette initiative a commencé dans le district de MUSANZE avec 5 éleveurs et maintenant il est pratiqué dans 30 districts du pays où environ 50% de petits exploitants pratiquent ce système. Cela a été rendu possible par le fait que :

- L'éleveur a la volonté de pratiquer une agriculture intensive ;
- Les sols pauvres qui exigent l'utilisation de la fumure organique ;
- Les arbres pour la construction des étables sont disponibles dans la région ;
- L'existence d'une politique gouvernementale qui soutient cette initiative et la bonne volonté des autorités locales impliquées dans le suivi de la mise en œuvre de cette politique ;

L'état a soutenu ce système d'exploitation et vulgarise à grande échelle la plantation des herbes fixatrices du sol sur les courbes de niveau (lutte contre l'érosion) mais qui servent aussi de fourrages au bétail.

Zero-grazing dairy farming through Cooperatives, Kenya (CAK)

Region/Province: Githunguri Dairy Farmers Co-operative Society Ltd

Githunguri Dairy FCS is situated in Kiambu County in the Republic of Kenya following the promulgation of a new constitution on the 27th August, 2010. The main socio-economic activity in the area is agriculture, with dairy farming constituting the greatest percentage from where many households derive their livelihoods. Its close proximity to Nairobi the capital city of Kenya offers a ready market for its value added products.

Background

The Co-operative Movement is capable of playing the crucial and leading role in adaptation and mitigation on climate change as Co-operatives are bound together by common principles and values. Co-operatives are about people and climate change is one of the biggest threats to mankind today.

As climate change becomes a reality the world over, there is no option but to counter it expeditiously as the livelihoods of billions of people in various parts of the world is at stake. The Co-operative Movement worldwide is capable of playing a leading role in mitigation and adaption to climate change.

The Co-operative Movement model of socio-economic development started way back in 1844, in England and was first introduced to Kenya in 1908 and has grown tremendously from 1,030 Co-operative Societies at independence in 1963 to over 12,000 to-date with a membership of over 8 Million people who have mobilized savings to the tune of Kshs. 200 billion (equal to US\$ 2.5 Billion) or 30% of the National Savings.

This case is an example of how co-operatives in Kenya are responding with a people-perspective to achieve food security and income growth and the case study could serve as

an adaptation strategy that Co-operatives and other players could adopt on climate change.

Description of the initiative: Zero Grazing Dairy Farming in Githunguri

Githunguri Dairy FCS was formed in 1961 by 31 members and currently it has grown to 17,000 registered members, annual turnover of Kshs. 3 billion (US\$ 37.5 Million) and an average production of 170,000 litres of milk per day.

Due to the small land sizes for the smallholder farmers, exacerbated by climate change, the dairy farmers adopted zero grazing as a farming method. The challenge of inadequate fodder for the animals is addressed by the Co-operative Society through provision of dairy animal feeds from outside the area of operation. The Co-operative Society also provides other dairy farm inputs, artificial insemination of high quality, facilitation of Kenya stud book registration, members training on good animal husbandry, dairy extension services, animal health laboratory, improved access to financial services and members' education on cross-cutting issues.

In 2004, a milk processing plant was commissioned leading to enhanced access to wide market through value addition and wide range of dairy products such as fresh milk, yogurt, lala, butter, ghee and cream. Today, the investment has revolutionized not only the livelihoods of the farmers in Githunguri but the dairy industry in Kenya.

The project was initiated by:- small-scale dairy farmers, who financed the investment with their milk deliveries by paying Kshs. 1.00 (US\$ 0.01) per every litre of milk delivered to the Co-operative Society.

Brief presentation of the climate change challenges/issues faced by smallholder farmers before the initiative

Before the initiative, the smallholder farmers carried out subsistence farming with fewer dairy cattle with low production, with the only available market for the produce being the

neighbors who could buy milk for subsistence. After forming the co-operative, the only market then was Githunguri and Ruiru towns until 1965 when they sold 4,275 liters of milk to Kenya Co-operative Creameries, the market leader at the time, daily. As a result of low milk production, in 1975 the co-operative started Banking services where members were given loans and as a result milk production increased tremendously. In the 1990's the economic liberalization set in with its challenges. As a strategic measure to avert the adverse effect of market liberalization as well as take advantage of the opportunities provided for enhancing the incomes for the farmers, the Co-operative Society commissioned the plant for milk processing and packaging in 2004.

The impact/effectiveness of the initiative on livelihoods:

The vibrant Co-operative Society now offers the farmers with available market outlet for their produce and this has boosted their quantity/quality production and encouraged everyone in the area to take all the milk to the Co-operative. This has led to increased membership, increased loyalty, and higher payment to producers, employment creation and enhanced food security for the area and the country at large.

Make an assessment of the cost-effectiveness of the initiative:

The Githunguri Zero Grazing Dairy Farming initiative is a success story of the power of numbers, a shared vision and unity of purpose that led to pooling of resources together for socio-economic welfare of the members. The community venture started with baby steps and is now a vibrant business venture ensuring food security, income growth and sustainable development in rural Kenya.

How participatory is the initiative? What is the role of stakeholders (e.g. Farmers, FOs, others)? Who drives the process?

The availability of a ready consumer market at close proximity and the high value products from the Dairy Co-operative is the key driver of the process, not to mention the farmers who are the direct producers and the beneficiaries.

Can this initiative be easily replicated to another region or country? Is the technology transferable or adaptable to context and circumstances? What are the main conditions or success factors for replicability?

The initiative can be replicated in other regions or countries in areas that are favorable for dairy farming. The farmers must be ready to practice good animal husbandry with high yields of milk, pool their resources together, share the vision and have unity of purpose where they all agree to deliver the raw milk to the processing plant without fail. Where there is low farmer patronage, it is not possible to have a successful processing plant as it requires consistent delivery of enough quantities of milk for processing.

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WATER MANAGEMENT STRATEGIES

Chabuma Amcos Irrigation project in Tanzania (TFC)



Project Summary

Content	Description
Where	Chinangali – Dodoma - Tanzania
What	Name: Mradi wa kilimo cha Zabibu (Grape farming project) Was initiated by: Farmer's cooperatives Is supported by: CRDB bank, Government through local government (Chamwino municipal), NGO
Context	Due to the nature of the area of low rain and after the climate change now they face low and irregular rainfall. They decided to fall into drip irrigation
Description of the initiative	Initiated in 2007 but effective in operation since 2008 Target group of the project are farmers in villages around the project
Impact	The project has helped the farmers in six villages around the project to adapt the situation of low and irregular rainfall by using drip irrigation. Now they are working without depending on uncertain rainfall. As the start of the project as it was done by them, they got money to sustain themselves and their families. Example digging alone they could get at least 25,000/ and that time the tin of maize was at 8,000/ hence no could starve. After

	the project completion they will earn money for about 70 years as that is the lifespan of grapes.																								
Cost-effectiveness	<p>The project is cost effective! Look at simple calculations done by one of the farmers in the project</p> <table border="1"> <tr> <td>Credit</td> <td>6,000,000</td> <td>6,000,000</td> </tr> <tr> <td>Interest (14% bank 2% SACCOS)</td> <td>16%</td> <td>360,000</td> </tr> <tr> <td>Total debt</td> <td></td> <td>6,360,000</td> </tr> <tr> <td>payment period</td> <td>3yrs</td> <td>3</td> </tr> <tr> <td>annual return by farmers</td> <td></td> <td>2,120,000</td> </tr> <tr> <td>if supervised well season sales are</td> <td></td> <td>10,000,000</td> </tr> <tr> <td>year has 2 seasons</td> <td></td> <td>20,000,000</td> </tr> <tr> <td>gross sales (after deducting annual return)</td> <td></td> <td>17,880,000</td> </tr> </table> <p>It can be seen that in a year a farmers will pay for his /her credit and then after he / she will be earning money for about 70 years.</p>	Credit	6,000,000	6,000,000	Interest (14% bank 2% SACCOS)	16%	360,000	Total debt		6,360,000	payment period	3yrs	3	annual return by farmers		2,120,000	if supervised well season sales are		10,000,000	year has 2 seasons		20,000,000	gross sales (after deducting annual return)		17,880,000
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year has 2 seasons		20,000,000																							
gross sales (after deducting annual return)		17,880,000																							
Participation	<p>On this case the participation is full done as the project is fully owned by farmers trough their cooperatives and saccos. Also the project is done in PPP where by CRDB bank is a private profit making organization and on the other side the government has given a subsidy. Also District agriculture and livestock development officer (DALDO) and District Executive officer (DED) are involved. However even NGOs has their contribution into the project and also as said above it is owned by farmers themselves and hence even them are fully involved.</p>																								
Empowerment	<p>Empowerment was done by taking farmers themselves lead the project. The lead the project in all areas. Some were taken for technical training and now are back in the project. Although they are not running it fully computerized as it could be done but manual they are achieving the objectives</p>																								
Replicability	<p>This project can be replicated in either way, by taking as what is done in areas were grape grows. Or the drip irrigation through cooperatives but in different crops and in Tanzania the project is about to be replicated in rice and cashew nuts.</p> <p>This technology is adaptable as it works on both manual and full computerized. To small farmers like this of chinangali they operate manually but plan for full computerized next time.</p> <p>Main factors for success in the working through cooperatives and the involvement of private sector in the project. Otherwise commitment was necessary for the project.</p>																								

Explanation about the project

The project is also referred to as Chabuma Amcos, this is an acronym of names from six villages around the project area and they are the one with members in the project. The villages are Chamwino and Chinangali represented by CHA Buigiri represented by BU and Manchali, Makoje and mbele represented by MA.



Figure 1: the dam

The project was initiated by members! They started a Sacco and while asking for credit from CRDB bank for farming they were advised to have a cooperative society to own and maintain the farm. The project actually started in 2007 under the name SACCOS which received credit from CRDB and lent money to farmers through their cooperative society which is Chabuma Amcos Ltd in 2008. From 2008 till now the project is under Chabuma Amcos Ltd.

In the start of the project there were 250 farmers who accessed a credit of TZ 6 million each with some money donated by NGO (RFSP) and Government to make each farmer investing a total of 8 million including his own power. Then after some 50 members joined the cooperatives and since they required no credits so they were accepted and they invested the same amount of money to make a total of 300 farmers and each farmer had one acre.

The farm is operated by cooperators themselves where by each and every farmer is owning 1 acre. The project is having 300 acres by now those are prepared although those planted are 126. The Chabuma has undergone another registration of 400 farmers and hence soon the cooperatives will produce 700 acres of grapes. In the long plan the cooperatives are planning to have a total of 1800 acres if possible in which 1000 will be owned by farmers and the rest 800 will be for medium and large investors.



Figure 2: Filter machine for drip irrigation

How the irrigation is done?

First they get underground water by using long wells and then water is taken to the dam of 500 meter wide and 1400 length with a depth of 5 meters (see figure 1 above). From the dam water is taken to pump house, while going there

it pass through filter to make sure they are no rubbishes and other materials going through, from there they will pass through a regulator which will make sure only a required amount of water pass trough and return un wanted water.

then water will pass through big tanks which are meant for mixing water and chemical manure or even water with pesticides.

From there water will go to distributors (see figure whicha re meant to distribute to farms

Figure 3: water distributors

There are six distributing channels in one distributor (see figure 3) that are placed under ground and each cans serve to six acres three on either sides at once. Then the farm and all places just receive equally and adequate amount of water.



The cooperatives here are dealing with all aspects of the product from farming to marketing. In terms of marketing they have the following;

1. A contract with stamiko to buy all their product at the agreed market price of that time
2. If they won't manage to finish all the product then they are still selling the idea to TBL for buying the products
3. Also they have opened a market to other people like recently they will meet Kenyan and South African for market talking.
4. In long run they are still talking to SIDO in the establishment of

their own industry for wine production and hence they will be selling wines.



Figure 4 a farm in drip irrigation

Collecte des Eaux de Pluie Venant des Toitures des Maisons, Rwanda (IMBARAGA)

PAYS : RWANDA

REGION : PROVINCE SUD ET NORD

UNITE PAR : IMBARAGA

SOUTENU PAR : LES AUTORITES LOCALES

1. Contexte

La Province du Nord est une région de très hautes montagnes où les pluies tombent généralement neuf mois sur douze que compte une année. Depuis plus de 15 ans, les précipitations ne sont plus régulières. Des aléas climatiques surgissent (sécheresse, inondations, glissements de terrains, érosion; ...) et tout ceci a un impact négatif sur l'environnement et l'économie nationale. Ces phénomènes sont attribués aux changements climatiques.

Ainsi dans notre initiative de collecte des eaux de pluie a partir des toitures de maisons, nous voulons atténuer les effets de ces phénomènes étant donné que la façon dont les eaux sont gérées a une influence significative sur le changement climatique. Ce dernier se manifestant par la perturbation des saisons culturales, la disparition de certaines espèces végétales, la prolifération des moustiques et des pucerons; etc... alors qu'il y a 30 ans environ, ce n'était pas le cas.

2. Comment collecter les eaux de pluie qui tombent des toitures de maison ?

Le système est très simple :

- Construire une caisse de 1 m³ à 6 m³ à l'aide de sticks, planches ou madriers ;
- Mettre à l'intérieur de la caisse une bâche ou shiting ;
- Couvrir la caisse d'une tôle ;
- Relier la caisse à la gouttière (en tôle) fixée à la toiture de la maison par un tuyau qui débouche dans un filtre (seau contenant des graviers et charbon) ;

- Suspendre la caisse à une hauteur de 1m et y mettre un robinet en dessous pour faciliter la collecte de l'eau. A l'aide d'un récipient procéder au nettoyage de l'intérieur de la caisse, une fois par trimestre.



Le schéma ci-dessus montre la méthode utilisée pour collecter les eaux des toitures de maison chez les petits exploitants.

3. Effets de ce système sur le changement climatique

- Diminution de l'érosion hydrique ;
- Diminution des inondations surtout dans les régions de basse altitude ;
- Les eaux recueillies dans les caisses sont utilisées dans l'irrigation des cultures, l'abreuvement des animaux domestiques, la blanchisserie, le nettoyage et propreté des maisons, la cuisson des aliments ; etc.

4. L'efficacité de la collecte des eaux dans la sécurité alimentaire des petits exploitants

- Les eaux recueillies n'emportent pas les terres sur les collines et n'inondent pas les cultures dans les vallées ; de ce fait la production agricole reste protégée.

- L'utilisation des eaux de pluie dans l'irrigation des jardins potagers augmente la production de légumes qui assure la sécurité alimentaire aux niveaux des ménages pauvres.
- Le temps qu'un membre de la famille utilisait pour aller puiser de l'eau (au moins 2h) par jour est économisé et on l'utilise dans les travaux de champs pour la production des denrées alimentaires ou dans d'autres activités génératrices de revenus.



5. Une technologie très efficace avec des coûts réduits

Un réservoir de 5 m³ (5000 l) est réalisé avec un coût allant de 100 à 250 \$ USD seulement ALORS que les autres techniques utilisées coûtent aux environ 1000 \$ USD après l'installation définitive.



Collecte des eaux avec matériel simple



Collecte des eaux avec matériel en dur

6. Rôle des acteurs impliqués dans la collecte des eaux

- IMBARAGA sensibilise la population sur l'importation de la collecte et l'utilisation des eaux de pluie ;
- Le rôle de la fédération IMBARAGA est d'animer des formations pratiques sur la construction des réservoirs et de diriger les travaux ;
- L'exploitant bénéficiaire achète lui-même le matériel nécessaire et engage un ouvrier pour l'aider ;
- Si l'exploitant n'a pas de madriers ou sticks, il fait recours aux vendeurs de planches, de clous et de bâches.

7. Une initiative en progression constante

IMBARAGA a démarré la phase pilote avec un seul réservoir en 2005 et maintenant 1600 réservoirs sont opérationnels dans les districts de Musanze, Burera et Huye.

8. La collecte des eaux de pluie avec un matériel simple est-il adaptable ailleurs ?

- Cette initiative est faisable dans toutes les régions où il pleut régulièrement ;
- Les sticks de bois ou les madriers sont disponibles dans la région ;
- Ce système est vite adopté dans les zones où l'eau est commercialisée et dans les villages où il faut faire une longue distance pour accéder à l'eau des cours d'eau naturels.

Rainwater harvesting for irrigation, Uganda (UNFFE)

Country: Uganda

Region: Central region

Brief overview of the country's economy and the sector:

Uganda's economy is agriculture based, with agriculture employing over 80% of the population and generating 90% of export earnings. Coffee is the main export crop, with tea and cotton other agricultural products. More than 85% of the agricultural activities are both rural based and are on subsistence. Most of the agriculture in Uganda is weather-dependent (rain-fed).

Name of the initiative:

This initiative is rain water harvesting and storage in an underground tank. Its is by amember organisation of UNFFE called J.H. Flouricultural growers. It consists of 120 individual members. It is located in the central region of Uganda but its members are from across the country. The visited farm consists of cut-flowers, crops (maize and ground nuts) and livestock (cows and pigs). The initiative has been in operation for three years.

Description of the initiative:

The initiative is the construction of an underground water storage facility where water is collected from the roof of the tank and a residential house. It is then channeled and stored in an underground tank whose capacity is 150,000 liters.



Figure 5 Roof of the underground tank



Figure 6: Water flowing from the tank



Figure 7: Tank used for irrigation

The water is the pumped using a small generator , to a raised tank where the water, by

gravity, is used for irrigating the whole field and some of it used for the livestock on the farm. The fields are irrigated by pipes which run through the entire field covered by flowers and other food crops.



Figure 8: Pipe used for irrigation

Effectiveness of the initiative in terms of adapting to climate change effects

The initiative is effective in reducing the effect of water shortage especially during droughts, which i was told have become very frequent. Mrs. Harriet Ssali, one of the leaders of the group notes that the area used to be very unproductive. However, since they started irrigating, production has been more consistent, and there is always food to eat. In addition, the farmers receive additional income from the sale of flowers. She said that as a result of increased income, the organisation was constructing a cold room for storage.

“The tank has helped us to have production through-out the year. When we first came to this place, we would have no water for some parts of the year.”

Mrs. Harriet Ssali, farmer

Cost effectiveness of the initiative

The initial cost outlay is quite high, and varies according to the size of the tank. However, the initiative is cost-effective over the long term, as the beneficiaries are guaranteed a supply of water throughout the year. The benefits are mainly realized during the drought-spells when prices increased due to supply shortages in the market.

Possibility of replicating this in another region or countryregions

This initiative can be replicated to other regions in the country and even in the region. Mrs. Ssali remarked that other members were doing the same on their individual farms, even those in different parts of the country like south-western Uganda. It may not be duplicated in exact context but the concept of tapping rain water and storing it in an underground storage facility is one which is economically feasible and should be up-scaled to other parts of the country and the region. The initiative will go a long way in reducing the problem of water shortages and unpredictable rainfall patterns.

Case prepared by

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FISHERIES MANAGEMENT STRATEGIES

Fish Farming, Uganda (UCA)

Introduction

Uganda Cooperative Alliance Ltd (UCA) is an umbrella body of cooperatives in Uganda that was formed and registered in 1961 under the co-operative societies' statute. It is owned by member co-operatives through shares and members' annual subscription. UCA is mandated to carry out advocacy and representation of the Uganda Cooperatives, providing education and training and mobilisation of resources for the development of the cooperatives. The clients of UCA are: primary cooperative societies called Rural Producer Organisations (RPOs), Secondary cooperatives called Area Cooperative Enterprises (ACEs), Regional and national Cooperative Unions, Savings and Credit Cooperative Societies (SACCOs) and individual members of the above organisations (who are served through their respective organisations).

UCA Fish farming programme

Since 1980s, UCA has been working with development partners especially Swedish Cooperative Centre (SCC), Norges Vel and Canadian Cooperative Centre (CCA) to promote development of small scale farmers. Fish farming is one of the major enterprises supported by UCA. In 2007, UCA put more emphasis on fish farming. This was due to the following factors;

- a. Due to high population growth of Uganda of 3% per annum, there is a shortage of land in some parts of the country. As a result, farmers have started draining swamps to create more land for cultivation. UCA introduced fish farming to enable farmers use land near wetlands better. Fish ponds are a better alternative

- because they do not involve draining of swamps. Instead ponds retain all the water.
- b. UCA noted that there was growing demand of fish in Uganda and other countries. This resulted into overfishing on natural lakes leading to catching of immature fish. The fish ponds are therefore to reduce on the stress imposed on natural lakes which is likely to lead to extinction of some species of fish.
 - c. Fish farming is a profitable business compared to other enterprises. Therefore it was seen as a way of reducing poverty in rural areas by increasing farmers' incomes.

Description of the project

- a. **Identifying farmers:** Farmers were identified from members of cooperatives who had suitable land for fish farming.



Figure 9: A couple, with their fish pond in background



Figure 10: UCA has encouraged women to participate in fish farming. The lady in the picture owns 5 big fish ponds in Kamwenge district in western Uganda. One of the ponds is in the background.



Figure 11: A lady from Kicheeche ACE in western Uganda

- b. **Identifying trainers and training farmers:** Farmers were trained by service providers who were hired by UCA. Training covered pond construction, pond management, fish feeding, fish harvesting, processing and marketing.



Figure 12: One of the groups of farmers trained by UCA in fish farming



Figure 13: Women undergoing practical training in fish pond management and fish harvesting.

- c. **Linking farmers to input suppliers:** The major inputs of fish are feeds and fingerings (young fish). UCA purchased and supplied both fingerings and feeds to all the farmers who had constructed ponds. They were linked to private dealers who sell these inputs.



Figure 14: UCA staff delivering fingerings to the farmer in Ntungamo district



Figure 15: UCA staff delivering fish fingerlings to one of the farmers



Figure 16: Fish fingerlings which are delivered to fish farmers

- d. **Continuous extension education:** Service providers continued to train farmers in all aspects of fish farming. Some of the farmers were trained on how to construct hatcheries for producing tilapia and catfish fingerlings.



Figure 17: Two extension (ladies on the left) guiding the farmer on how to manage a cat fish hatchery



Figure 18 *Farmers have been trained on how to make hatcheries. Above is a Tilapia hatchery in the pond in Nyabubaare ACE, Bushenyi district in Western Uganda.*



Figure 19: Farmers constructing a local cat fish hatchery in Ntungamo district, in western Uganda



Figure 20: Behind (thatched with iron sheets) is a local hatchery constructed by farmers in Kamengye district, in Western Uganda

- e. **Linking fish farmers to other partners:** Through such partners one of the cooperatives managed to get funds from Coop Africa to put up a fish hatchery and feed mill.
- f. **Mainstreaming environment in fish farming operations:** Service providers teach farmers how to carry out fish farming without damaging the environment. For example, those who use water from rivers are advised not to drain used water into the river.
- g. **Linking farmers to financial services:** Almost all secondary cooperatives under UCA are linked to Savings and Credit Cooperative Societies (SACCOs) where members can save and borrow funds to facilitate production and marketing of fish.
- h. **Promote diversification:** Fish farmers are encouraged to engage in other one or two enterprises to avoid relying on only fish farming
- i. **Linking farmers to markets:** UCA helps to link fish farmers to markets. One of the cooperatives under UCA called, Walimi Fish Cooperative Society Limited (WAFICOS) has managed to link the members to large buyers who operate fish factories. As a result of selling together, members have managed to negotiate for the price of fish which is almost twice the open market price.
- j. **Holding exhibition/symposiums:** These exhibitions are coordinated by Walimi Fish Cooperative Society Limited (WAFICOS). WAFICOS is one of the large fish farming cooperatives under UCA. It was registered as a cooperative society in 2004. It was set up primarily to provide a forum through which fish farmers could collectively acquire the essential services and inputs necessary to ascertain the viability of their fish farming operations. Currently, WAFICOS has 315 active members who are the share holders. Among the members are fish farmers and input suppliers. They help farmers to access inputs and markets. WAFICOS holds a fish symposium once a year which brings together fish farmers, input suppliers, fish buyers, policy makers and other

stakeholders. The cooperative also sells live and frozen tilapia and cat fish on behalf of the members.



Figure 21: Pond construction equipment displayed at a fish symposium

- k. **Formation of a national union:** UCA facilitated cooperatives which have fish as one of the selected enterprise to form a national Union. This union is supposed to help fish farmers to access inputs at reasonable price, to lobby for the fish sector and find bigger markets for fish.

Impacts

- a. **Proper use of land near wetlands:** Since fish farming is profitable, farmers now prefer to use land near wetlands for fish farming rather than draining it for cultivation.
- b. **Reduced pressure on natural lakes.** Fish ponds have provided an alternative source of fish to the growing fish demand which would have lead to total fish extinction on natural lakes especially Lake Victoria. Fish factories are beginning to rely on fish ponds as a source of fish for export.
- c. **Employment:** Fish farming employs many people in digging ponds, managing them, fish harvesting and marketing. So far there are about 2,000 fish ponds owned by cooperatives under UCA.

- d. **Increased farmers' incomes:** As of now there is no standard stock rate of fish ponds since it depends on the capacity of the farmer to manage the ponds. But to every shilling spent of fish farming a farmer gets 3 Uganda shillings (One US dollar is equivalent to about 2,000 Uganda shillings). This is a high rate of return compared to other enterprises. From one pond, of 1,200M², a farmer earns between Uganda shillings 20 million to 30 million depending on the stock rate. Fish farming is therefore an enterprise which can reduce poverty quickly.
- e. **Increased investment in fish farming:** Several secondary cooperatives are investing in fish feed mills and hatcheries. For example, NAMA ACE in Central Uganda got assistance from Coop-Africa and is constructing a hatchery and a feed mill to supply fingerlings to fish farmers.
- f. **Food security:** Fish farmers consume some of the fish they produce. Also local communities have where to buy fish which is a rich source of protein.

Major Constraints

- a. **Shortage of feeds:** Feeds are still expensive. Most of the good feeds on the market are imported.
- b. **Inadequate hatcheries:** So far there are about 10 hatcheries owned by members of the cooperative movement. These are not enough considering the high rate at which farmers are digging fish ponds.
- c. **Inadequate funding:** The cost of contracting a fish pond is very high. A pond of 1200M² can cost about 1,500,000 Uganda shillings (USD 750) to dig. Most of the rural farmers cannot afford this.
- d. **Limited Knowledge:** Fish farming requires high skills which most farmers do not possess. There is also need for research on fish threats like diseases.

Areas which require partnerships

- a. **Input supply** requires support and or partnership with the private sector. UCA is encouraging fish cooperatives to put up feed mills and hatcheries but the response is still low due to high costs involved.
- b. **Markets:** There is a growing market for fish in Uganda and other countries. There is still need to explore markets which are stable to enable farmers produce on contracts.
- c. **Organic farming:** this is another area which is to be explored by cooperatives to enable farmers earn a prime price for organic fish in export markets.
- d. **Soft loans:** Farmers need soft long term loans to be able to dig and stock fish ponds.
- e. **Strengthening cooperatives further:** There is still need to support cooperatives to become strong in terms of governance and financial positions. This will increase the ability of cooperatives to serve members better.

Conclusion

Fish farming is a viable enterprise which will ensure sustainable use of wetlands and provide a constant flow of income to the farmers. The sector deserves support by development partners and governments.

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CROP AND LAND MANAGEMENT

Cafnet Coffee Project, Uganda (NUCAFE)

Content	Description	
Where	Country – Uganda Region – Central Province	
		
	<p>A group of girls carrying firewood from the forest. “We have to travel a long way; to reach the forest where we can harvest firewood, this one nearby is protected by government forest people who punish us when we harvest firewood here”.</p>	<p>A motor cyclist carrying charcoal to the trading center. There is a high demand for the form of fuel, in urban and peri-urban areas: As a result leading to a high increase in premature forest tree cut down.</p>



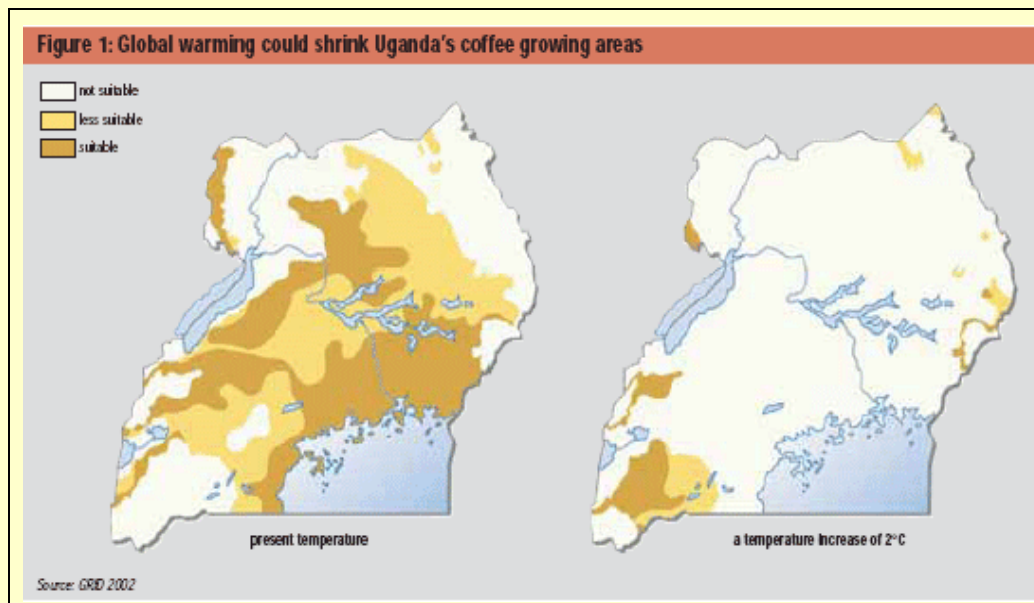
Mr. Mukasa of Mukasa Estates says, “Previously before intensifying on planting of tree in my garden, the yield was high and good, but the bean size was poor and when it came to the dry season, I almost and always never wanted to get back to the garden it was such a horrible site of drying and dying coffee trees. When I received training from NUCAFE, we started by planting banana trees, then the shade trees follow; the coffee yield even got better and the beans size to, when it comes to the dry season, the trees in the shade are really green throughout”.

A soil analyst taking soil samples from a field being prepared for new coffee seedlings. In such fields farmers have been trained to intercrop with banana plants that provide the coffee plant with immediate shade and later progressively switch to the actual shade trees.

<p>What</p>	<p>Name of the initiative – Cafnet Agro-forestry Initiative</p> <p>Was initiated by –ICRAF & National Union of Coffee Agribusiness and Farmers Enterprises (NUCAFE), from Uganda.</p> <p>ABOUT NUCAFE</p> <p>National Union of Coffee Agribusiness and Farm Enterprises (NUCAFE) was founded in 1995 as the Uganda Coffee Farmers Association (UCFA). In 2003, UCFA changed to NUCAFE in response to members’ needs as a result of needs assessment and strategic planning carried out in year 2003. NUCAFE’s vision is for “coffee farmers to profitably own their coffee along the value chain for their sustainable livelihoods.”</p> <p>MEMBERSHIP</p> <p>Currently, NUCAFE has 125 coffee farmers associations at sub county level spread all over 5 main coffee growing regions of Uganda, with over 100,000 coffee farming families. NUCAFE mainly operates in 19 districts of Uganda. These include; Rukungiri, Bushenyi, Masaka, Rakai, Mpigi, Wakiso, Jinja, Kayunga, Iganga, Mbale, Sironko, Kapchorwa, Nebbi, Gulu, Bundibugyo, Sironko, Bududa, Manafwa and Arua.</p>
<p>Context</p>	<p>Brief description of climate change challenges (or issues) faced by small-holder farmers</p>

before the initiative:

1. Changes in rainfall patterns leading to flower abortion and sometimes poor coffee-bean filling. Coffee usually flowers when it rains, However for the flowers to develop, they need consistent rainfall. With climate change sometimes the rains are not consistent leading to the drying of flowers that are formed which is known as flower adoption. During the maturity of the coffee beans, the coffee beans need a lot of water during a stage where the coffee bean is filled with nutrients which are referred to as “pod filling”. With climate change sometimes there is no rain during this time which limits this process leading to poor yields.
2. Shifts in thermal regimes: this is the gradual increase in average temperatures and also having cold temperatures when the farmers are drying the coffee causes delay in drying. In some cases where the coffee is not well-handled, the coffee develops mould which can lead to coffee being rejected or fetching low prices thus the farmer losing income. There has been indication in several climate change scientific meetings which have indicated that an increase in two (2) degrees Celsius would reduce the coffee area for Robusta by over 80%.



3. Combination of increased temperatures and rainfall changes has led to an extension of the growing season. Though to a limited extent this was observed mainly after the drought of early 2009 and it led to a shift in marketing seasons for the farmers making the period for which the farmers have to wait longer yet so many do not have access to survival credit. Credit for meeting daily needs.

4. Influence local seasonal and annual water balances: this mainly affected water for domestic use making the women and sometimes children who are usually involved in collection of water walk longer distances and in some cases getting water whose quality is not good.
5. High incidences of pests and diseases (new pests imaging controllable disease are getting out of hand), this has been witnessed in the districts of Luwero, Mukono, Wakiso and Kayunga where cases of the coffee stem borer have exponentially risen leading to an outbreak. One farmer from Nsangi coffee farmers association called Mr. Buule Ronald has attributed this to the reduction in the population of spiders which he believes are the biological controllers of the stem borer.
6. Prolonged droughts leading to drying of some coffee plantations: this was seen in some areas which are close to the cattle corridor. An observation made of the trees that were in shade and those without shade showed that the trees without shade dried. See pictures below



Coffee without trees



Coffee with shade trees



Description of the initiative

The overall objectives of CAFNET agro-forestry initiative are:

- 1) to link sustainable management and environmental benefits of coffee agro-forests with appropriate remuneration for producers through better access to markets and payment for environmental services; and
- 2) to improve livelihoods for coffee farming communities while conserving natural resources in three major coffee agro-forestry regions located in world hotspots for biodiversity. The initiative started in 2008 with NUCAFE as the Uganda coordinating organization and with research for coffee done by the Coffee Research Centre (COREC) and research for agro-forestry done by The National Forestry Resources and Research institute

Target group is –Ten coffee farmers associations and some coffee estates with a total number



	of about 3,500 households.
Impact	<p data-bbox="367 358 1396 425">Describe the impact/effectiveness of the initiative in terms of mitigating the effects of climate change or adapting to the effects of climate change</p> <div data-bbox="367 436 1396 873">  </div> <div data-bbox="367 884 885 1153"> <p>Mr. Mukasa of Mukasa Estates showing Mr. Joseph Nkandu around the estates, about the progress of the shade trees that he received from NUCAFE.</p> </div> <div data-bbox="893 884 1396 1153"> <p>Mr. Livingstone Mpimbe of Kibenge Coffee Farmers Cooperative in Masaka says, “I have the best garden in Kibenge, farmers pass by and I’ve overheard some of them say that I irrigate my garden, but actually the secret is in the shade trees (Mutuba spp.) that I intercropped during the initial planting period.</p> </div> <p data-bbox="367 1220 1396 1411">The initiative has created awareness of the importance of agro-forestry in mitigating the effects of climate change in over 3,500 households. In one of the areas a coffee estate acting as a nucleus farm in an area prone to drought started a brand of coffee known as “SHARON” that is Shaded Robusta Nakaseke), and a on a wider scale NUCAFE has made it part of its services to promote shade grown coffee as a specialty coffee. In doing so over 30 Trainers of trainees (TOT) were trained in specialty coffee, including shade grown coffee as one of them.</p> <p data-bbox="367 1467 1396 1657">For the long term, the initiative has generated a lot of scientific data on the effect of shade on coffee quality, pests and disease incidences, soil fertility, and other aspects. Further scientific information has been generated on the agro-forestry trees suitable for coffee and how they can be optimally used, the social economic dynamics of the coffee agro-forestry systems and the possibility of carbon trading given the fact that coffee in an agro-forestry system lasts a long time (40 years) and over that period of time carries removes carbon from the air.</p> <p data-bbox="367 1713 1396 1780">A number of shade trees have been distributed to farmers which will provide shade for the coffee and mitigate the effects of climate change.</p> <p data-bbox="367 1803 1396 1892">In the process NUCAFE has invested in over 11 coffee nurseries each with a capacity of producing 100,000 coffee seedlings and an equivalent number of shade trees were need be, giving NUCAFE a total potential production of over 1.1million trees per year.</p> <p data-bbox="367 1904 1396 1937">Describe the impact / effectiveness of the initiative in terms of ensuring food security by</p>

	<p>smallholder farmers</p> <p>Generally the initiative has ensured food security by farmers through promoting use of bananas (matooke) as shade and also through obtaining better income which can also be used in the purchase of food.</p> <div style="display: flex; justify-content: space-around;">   </div> <p>A Farmer in Kasawo District showing fellow farmers before the training, his food crops collections, ranging from cassava crops planted along the garden border lines, and banana plants in between both doubling as shade crops.</p> <p>Mr. Luboyera of Bunjakko Coffee Farmers Association explains; “Coffee in this part has several intrinsic characteristics, but the best is key to coffee being shade grown, we do not use any fertilisers in our fields, the beans are big and heavy. Through NUCAFE now we are going to market our coffee as a special coffee variety to a certain roaster in Italy”.</p>
<p>Cost-effectiveness</p>	<p>Make an assessment of the cost-effectiveness of the initiative</p> <p>The initiative is long term with benefits projected to occur over a long period of time. The initiative is in its third and last year of implementation and an assessment of its cost effectiveness will be done at the end of this year.</p>
<p>Participation</p>	<p>What is the role of stakeholders (e.g. Farmers, FOs, others)?</p> <p>EU/ICRAF/CAFNET – Funding, Monitoring and Evaluation</p> <p>NUCAFE – Chief Accounting Body to Cafnet, Training and sensitization, production of training material, market linkages, gender equity, lobby and advocacy, equipment lease, capacity building.</p> <p>COREC – Coffee specific and related research (coffee yield, seasonal effects, pests and diseases, resistant varieties*), production of new technologies.</p> <p>NAFFORI – Coffee specific tree compatibilities, monitor carbon emission (tree and coffee), and shade effects on coffee yields.</p> <p>FARMER ASSOCIATIONS – Implementation, provide feed back at any given moment, monitor and evaluate coffee yield, market analysis</p>
<p>Empowerment</p>	<p>Have beneficiaries / stakeholders been empowered by taking part in this initiative?</p>

	Yes
Replicability	<p>Can this initiative easily be replicated to another region or country?</p> <p>Currently NUCAFE has embarked on first replicating the gender equity component, so far has been done in four regions, with a few sub-counties selected. As the adoption showed progress some associations started the agro-forestry program and is moving on smoothly in eastern and Western Uganda (Bushenyi and Rukungiri, Kapchworwa and Manafwa Districts respectively)</p> <p>Is the technology adaptable to context and circumstances?</p> <p>Yes. Coffee farmers are small scale farmers, what affects them; affect the general agricultural crop community.</p> <p>What are the main conditions or success factors that would support replication of this initiative to another region/country?</p> <ol style="list-style-type: none"> 1. Presence of farmer organizations: From the NUCAFE experience the presence of farmer organizations offer an avenue through which small holder farmers take lead in agro-forestry and as such easily adopt the practices, look after the seedlings better, share the knowledge thus making the process farmer owned and farmer driven. 2. Availability of financial resources to support the replication: Availability of resources for investing in production of shade trees and providing extension or farmer training is very critical in adoption. Given the long term nature of investments in shade trees it is important for the initiative to be phased but as well as long term. 3. Availability of adaptable tree seed/ planting materials: Deeping on the soils, the climate different tree species can be more useful than others as shade trees. Where research in shade trees has already been done adaptable trees that do not compete with the crops can be obtained. 4. Enabling policy environment: The effects of global warming are real and the means to address this problem are available. Projects can contribute a lot to solving this problem but the multiplier effect of the project interventions can be increased by institutionalizing these interventions through a policy. 5. Addressing pre-determine factors like, Gender equity at household level: During the project implementation it was realized that households where there is equity in decision making, the shade trees are better managed. This is because every household member understands the importance and value or benefits of the trees. 6. Use of Farmer Ownership Model (NUCAFE has a manual with an agro-forestry component in latest edition). The farmer ownership model is an information dissemination material which shortens the learning curve in terms of implementing the required interventions and as such

would be a useful tool in replicating the project.

Gender- equity in coffee farming households, Uganda (NUCAFE)

Content	Description
Where	Country: Uganda Region: Central, Eastern, Western & Northern region
	
<p>A lady farmer from Kyangyenyi CFA shows her coffee trees and the piece of land that was extended to her, by her husband after listening to gender training on Radio in Bushenyi district. “My husband had never entrusted me with coffee. But the gender training was a big change, now he even tells me to put the coffee on the truck when the group members are bulking for sale.”</p>	<p>A husband and wife, picking coffee. “I used to work in the field picking coffee beans, and weeding the coffee trees. My husband was more interested in the coffee marketing. However, when our group attended several gender training sessions, things changed. Now my husband and I are always in the field working together. We get more work done nowadays.”</p>



Ms. Nalukwago Gertrude

“It was very challenging to implement the gender program. As a woman, in the initial stages I feared to stand in front of the people, so I called on my fellow animator to come and help me with the training. They insisted on me, taking the lead role during the training, and this boosted my confidence. Now I can train without anything to worry about. I am proud that I have been very influential in involving the women, not only in the gender program but in the whole coffee production system. Some ladies had resorted to neglecting the coffee under the pretext that if it does very well our men would go and marry a second wife or get a new concubine, but that has all changed now.”



Mrs. KamakKitiyo (right)

“My husband and I have a large coffee plantation, we faced a problem of lack of firewood. When the trees were stumped, my husband preferred to sell of the coffee stems instead of bringing them home. During the gender training we were taught about the alternative sources of fuel and managing wood lots. We are now working together much better. We sell the heavy stumps and use the small ones at home. I no longer have to travel up the mountain to go to the forest to collect firewood. We have also planted shade trees in the fields. These trees offer shade to the coffee, and are also useful for fuel at home.”

What	<p>Name of the initiative Enhancing equity in decision-making in coffee farming households</p> <p>Was initiated by National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE)</p> <p>Is supported by DANIDA Agricultural Sector Programme Support (ASPS II)</p>
Context.	<p>Brief description of climate change challenges (or issues) faced by smallholder farmers before the initiative</p> <p>Gender initiative: In a bid to improve gender relations between men and women, NUCAFE implemented the gender equity project dubbed “Enhancing equity in decision-making in coffee farming households in Uganda”. With funding from DANIDA (ASPS), the project has so far been</p>

implemented in four districts of Nebbi, Masaka, Bushenyi and Kapchorwa.

The initiative was aimed at promoting equitable decision making practices among coffee farming households, groups, and associations. The aim was to enhance productivity and profitability for both men and women along the coffee value chain.

The project brought out the implications of gender practices and empowered farmers with gender analysis skills. Gender disaggregated data was gathered and analysed as a baseline and guide for NUCAFE's gender policy and strategy development process.

This was sought to contribute to improving productivity, profitability and quality of the coffee bean. Before this initiative, women were seen to be more involved in several stages of production for example tilling, pruning, harvesting and drying of coffee, among others. But when it came to making decisions on how to spend the earnings, it was only the man's decision.

Coffee was taken to be a man's crop and income from the crop benefited the man more than the woman. Scenarios of marrying additional wives, high sales of alcohol during the coffee boom were a reality. Therefore the women resorted to selling some of the coffee without a man's consent to meet domestic needs and this was referred to as "stealing" by men who were aware of the practice.


This came with a lot of consequences like domestic violence, family breakups and directly affecting productivity and profitability.

After NUCAFE's intervention, there was a gradual positive change and participating communities appreciated that promotion of equitable practices and enhancing equity in decision-making in coffee farming households will boost the coffee subsector performance in the long run.

At the beginning women were not visible in active participation in the groups and associations' activities and this is also contributed to by the norms and cultures which had suppressed women to come out and contribute to community development.

For example the family of Mrs. Chebet Joy, wife of Chepkwurui, from Chema Coffee Development Association in Kapchorwa district, attributed the increase of coffee productivity from 5 bags of parchment coffee to 8 bags due to improved working relationship after sensitization. Furthermore, the wife noted that improved working relationship led to reduced harvesting losses and increased coffee volumes and sales. The family also revealed an improvement in coffee quality since everyone provided labour in ensuring that there was no extraneous matter to cause contamination.

	<p>Ms. Annah Muhairwe confesses that after the initiative, marketing skills of women were improved and their involvement in coffee marketing contributed a lot in terms of price negotiations. This is because buyers would easily become sympathetic. Currently some women are able to market coffee with or without their husbands. Women were provided land by the husbands to grow coffee. NUCAFE is proud to report success stories of farmers who have resorted to working in their households as a business unit involving men, women, boys and girls. This approach has greatly improved productivity, profitability and incomes contributing to improved livelihoods.</p> <p>After the pilot project of one year, there was an extension period where on average the participation of women reached to 43% up from 10% at the start of the project.</p> <p>Household members were prompt in identifying the challenge(s) they faced and were able to address them. This led to drastic improvement in the management of farms, harvest handling practices ensuring selective picking of red ripe coffee cherries and properly dried coffee on mats and tarpaulins. These combined changes resulted into improved quality of coffee which was evidenced on cupping. NUCAFE was awarded four trophies during the National Coffee Cupping Competition ceremony organized by Uganda Coffee Development Authority (UCDA), Eastern African Fine Coffees Association (EAFCA) and the Coffee Quality Institute (CQI) of the United States of America in 2009.</p>
Description of the initiative	<p>Has been in operation since... June 2008 to November 2009</p> <p>Target group is... Coffee farming households</p> <p>Gender mainstreaming in NUCAFE is done with household as an entry point. Staffs were trained as Training of Trainers (TOTs) in gender to accelerate mainstreaming in their day to day activities. The trainers then trained association board members as policy makers and animators as community facilitators to sensitise households in gender mainstreaming. A perspective of the coffee value chain is taken to ensure that the household as a productive unit is able to maximize returns on investments in value addition. The idea behind integrating the household in the value chain is aimed at enabling men, women and youth to be entrepreneurs. This is done by NUCAFE facilitating linkages between farmers through their associations directly to exporters, importers, roasters, retailers (super markets) and consumers. In other words, NUCAFE integrates gender equity and coffee agribusiness. In place we have Organization gender mainstreaming and monitoring guidelines for farmer organizations mainstreaming and animators guidelines for household sensitization.</p>

Impact	<p data-bbox="408 376 1406 450">Describe the impact/effectiveness of the initiative in terms of mitigating the effects of climate change or adapting to the effects of climate change</p> <div data-bbox="421 461 1209 943"></div> <p data-bbox="421 960 1198 1055">Mr. Kamakitiyo (left) talking to one of the animators also doubling and a Business manager during the data collection process. He and his wife now have plenty of wood to use at home (background)</p> <p data-bbox="408 1137 1406 1619">Through the gender project, women have been able to acquire land, provided to them by their husbands where they have planted shade trees, and woodlots. This has not been practiced on the land owned by the women but also on the family owned piece(s) of land. Through Good Agricultural Practices (GAPs), the stumped trees have been dried and used as source of wood for the family, this has reduced on the intervals at which the women travel to virgin forests to cut down and/or harvest firewood. Families have received shade tree seedlings from the association owned coffee nursery to intercrop, plant in their fields to reduce on the impact of heat damages caused to the coffee trees during the long dry spells. In order to be able to counteract this effect before the shade trees reach the economic importance age, families have planted bananas in the garden, since these have an early maturity period.</p>



Mr. Ssenyonyi P. (Kyanamukaaka CFA – MASAKA)

“Before the start of the Gender project my coffee was doing well, I went with my wife to do the digging in the coffee gardens, but I took the sole decision of what to do with the sales. After being trained in the gender program, the production has increased and also the quality and care given to the coffee is good, this has come in a timely period and now my family is much happier.”

Describe the impact / effectiveness of the initiative in terms of ensuring food security by smallholder farmers

Every coffee farming household has a banana plantation, a farm for cassava, beans and other food crops. NUCAFE has encouraged households to inter-crop coffee with food crops such as beans and cassava.

Cost-effectiveness

Make an assessment of the cost-effectiveness of the initiative

The project has taken place in four districts of the country, where each district was represented by 3 associations (An association is made up of at least 10 groups and each group is made up of 35 farm families). The funds provided for the project were meagre however this did not deter the motivation and dedication of both the staff of the organisation and farmers to see this project to its success.

Participation

What is the role of stakeholders (e.g. Farmers, FOs, others)?

The farmers and FO's own and manage the coffee nursery that provides the seedlings. They do a lot of management especially in the dry season when

	<p>the seedlings need to be watered. The leaders (group and association) monitor the farmers who have received the planting material and also provide advisory services. The farmer organizations have a business manager who provides the agricultural extension education, which includes knowledge on land preparation and planting requirements. In addition, the business manager oversees the whole process and monitors the activities.</p>
Empowerment	<p>Have beneficiaries / stakeholders been empowered by taking part in this initiative?</p> <p>The beneficiaries have been empowered. During farmers' sensitisations NUCAFE uses the farmer ownership model empowering farmers to own their crop and this inculcates in them that it is important to add value in order to earn better prices. The challenges of being manipulated by the middle men has been minimised, originally farmers were being exploited and selling coffee at tender stages and earning little money but through this initiative, pre-financing is sourced to cater for farmers immediate problems to wait and add value to their crop for example a farmer is shown that selling a kilogramme of flowers earn USHS 225 (US 10 cents) and graded coffee earning up to USH 10,000 (US\$ 4.50) They have realised the difference and are gradually changing to the better. This model is recommended to be replicated by other coffee farmers in the region and other enterprises to boost development.</p>
Replicability	<p>Can this initiative easily be replicated to another region or country? Yes</p> <p>Is the technology adaptable to context and circumstances? No</p> <p>What are the main conditions or success factors that would support replication of this initiative to another region/country?</p> <p>Worldwide the coffee crop is connected to men, and women involvement is minimal. According to the findings women are more seen in activities to do with farming, pruning, picking, drying and sorting etc. During marketing it is the men taking the role and deciding on how the proceeds will be sent, NUCAFES initiative of using households as an entry point has proved successful where women and youth have been brought on board through encouragement of households working together with joint plans and transparency. Coffee productivity, profitability and quality are greatly improving for example quality evidenced by the four trophies awarded to NUCAFE associations.</p>

Fiche de saisie des données sur les études de cas de pays, Burundi (CAPAD)

Pays: BURUNDI	
Région/Province: BUBANZA	
Nom de l'initiative: Utilisation des Briquettes d'Urée dans la fertilisation du riz « UDP »	
A été initiée par: CAPAD	
Est soutenue par: IFDC/ CATALIST	
Brève description du contexte des défis des changements climatiques (ou problèmes) auxquels étaient confrontés les petits exploitants avant le lancement de l'initiative :	
<p>Les communes de Mpanda et Gihanga sont des communes où la riziculture occupe une place très importante pour les producteurs de cette zone. Les producteurs utilisent les engrais chimiques à tel point qu'ils peuvent même dépasser la dose recommandée par les institutions de recherche.</p> <p>Les principaux problèmes auxquelles étaient confrontés ces producteurs sont :</p> <ol style="list-style-type: none"> Utilisation d'une grande quantité d'engrais chimiques avec toutes les conséquences que cela cause à l'environnement ; Application de l'engrais chimiques à la volée occasionnant qu'une bonne partie de l'engrais n'est pas utilisée par la plante mais reste dans l'eau d'irrigation pour être ensuite être perdue par ruissellement et par évaporation; L'utilisation d'une grande quantité de semences. 	
Description de l'initiative (elle est opérationnelle depuis..., quelle est la nature de l'initiative, etc.)	
 	<p>L'utilisation des briquettes consiste à placer en profondeur entre quatre plants une briquette d'engrais de 1,8gr ou de 2,7gr. Cette briquette est fabriquée par une machine à partir de l'engrais chimiques disponibles (DAP, Urée, KCl). Cette technique fait appel à une autre technique de semis en ligne où les plants de riz sont semés à une distance de 20 cm x 20 cm et on doit sauter une colonne dans l'application des briquettes comme le montre la figure et la photo à gauche. La technique est opérationnelle depuis la campagne rizicole 2009 - 2010.</p>
Décrire l'impact / l'efficacité de l'initiative en termes d'atténuation des effets des changements climatiques ou l'adaptation aux effets des changements climatiques:	
<p>Il est encore tôt de décrire et de conclure directement l'impact de l'initiative mais les premiers résultats obtenus avec la première saison ont montré qu'il ya eu une diminution dans l'utilisation des engrais à raison de 26,46% pour l'urée et 12,13% pour le DAP.</p>	
Décrire l'impact / l'efficacité de l'initiative en termes de la sécurité alimentaire parmi les	

petits exploitants:

Comme précédemment, il est encore tôt de décrire et de conclure directement l'impact de l'initiative mais les premiers résultats obtenus avec la première saison ont montré qu'**il ya eu une augmentation** de la production de **49,3%** avec l'utilisation des briquettes comparée à la pratique de l'agriculteur.

Faire une évaluation du rapport coût-efficacité de l'initiative:

L'efficacité de cette initiative est largement supérieur au coût car la diminution de la quantité d'engrais utilisé fait baisser le coût et l'augmentation de la production à la récolte permet aux producteurs d'améliorer leurs revenus. Le profit que les producteurs tirent dans cette initiative fait vivre leurs familles et cette initiative est productive.

A quel point l'initiative est-elle participative? Quel est le rôle des parties prenantes (par exemple, les exploitants, les Organisations paysannes et les autres)? Qui dirige le processus?

L'initiative est participative car le producteur est impliqué au premier degré car l'initiative se déroule dans son champ. La CAPAD qui est une organisation paysanne initiatrice de l'initiative est impliquée en donnant tout le paquet technologique et en disponibilisant les intrants. Les autres acteurs comme les détaillants d'intrants sont impliqués par l'approvisionnement de la matière première à la machine qui fabrique les briquettes logée à la CAPAD.

Les bénéficiaires / les parties prenantes ont-ils été habilités en prenant part à cette initiative?

Cette initiative peut-elle être facilement reproduite dans une autre région ou un autre pays? La technologie est-elle transférable ou adaptable aux différents contextes et circonstances? Quelles sont les principales conditions ou facteurs de réussite qui permettent la répliation?

Cette technique peut être facilement reproduite dans une autre région ou un autre pays car la CAPAD a tiré aussi cette technique de la Thaïlande. Elle est transférable. Les principales conditions de réussite permettant la répliation sont :

- i. Les bénéficiaires utilisent les engrais chimiques ;
- ii. L'adhésion des bénéficiaires à l'initiative ;
- iii. Les capacités techniques et financières de l'initiateur.

LUTTE ANTIEROSIVE EN TERRITOIRE DE RUTSHURU, DRC (FOPAC)

PROVINCE DU NORD-KIVU

1. GENERALITE SUR L'ECONOMIE DE LA RDC ET CELLE DU NORD-KIVU

La République Démocratique du Congo fait partie des pays les moins avancés. Sa structure économique est comparable à celle des autres pays de l'Afrique centrale mais son économie est handicapée par une guerre civile larvée et un des niveaux de corruption les plus élevés de la planète.⁴

En effet, la situation socio-économique est toujours tributaire du contexte politique. En RDC, celle-ci a été et reste affectée par les différentes crises politiques en répétition.

L'économie de la RDC est parmi les plus faibles de l'Afrique malgré ses multiples ressources ; la RDC est considérée comme un scandale géologique dont le sol et le sous-sol ne permettent à ces jours d'effacer le paradoxe d'un pays potentiellement riche mais réellement pauvre.

En fait, la République Démocratique du Congo, un des pays les plus vastes et les plus peuplés du continent africain, n'a pas le niveau de vie qui devrait correspondre à ses immenses ressources naturelles (minerais précieux, produits agricoles,...).

En 2006, elle est l'un des dix pays les plus pauvres du monde et les inégalités y sont très marquées. Environ 80% de la population vivait en-dessous du seuil de la pauvreté fixée à 2 dollars américains par jour. Près de 44% de femmes et environ 22% des hommes n'ont aucun revenu. Les disparités régionales sont très fortes avec un

⁴ Forum économique mondial sur l'Afrique, tenu du 13 au 15 juin 2007 : Rankings 2007.

taux de chômage très élevé avoisinant les 40% des salaires et des prestations sociales dérisoires dans tout le pays et son économie est une des économies les moins compétitives d'Afrique.⁵

L'agriculture reste le principal secteur de l'économie représentant 57,9% du PIB en 1997 et occupait 66% de la population active.

Tableau d'indicateurs macroéconomiques de la RDC

Années \ Indicateurs	2000	2001	2002	2003	2004	2005	2006	2007
PIB à prix courant (en milliard de U\$)	4,3	7,5	5,5	5,7	6,3	7,1	8,3	9,1
PIB aux coûts facteurs (en milliard de FC)	227,1	290,8	300,9	318,3	340,3	362,4	387,8	414,9
Taux de croissance (en %)	6,9	2,1	3,5	5,8	6,9	6,5	7,0	7,0
Inflation monétaire (en fin de chaque période)	554	357	25	13	9	21	8	6

Source : Banque centrale du Congo, situation macroéconomique de la RDC, décembre 2007.

Les problèmes économiques sont notamment :

- Manque d'infrastructure de base (routes, structures sanitaires)
- Non exploitation rationnelle des ressources naturelles
- Un taux de corruption très élevé
- Fluctuation de la monnaie face au dollar américain

La RDC, vaste pays dont 70% de la population vit en milieu rural et dépend de l'agriculture. Sa population est en augmentation exponentielle et celle-ci entraîne des besoins croissants en produits agricoles, en

⁵ Forum économique mondial sur l'Afrique, tenu du 19 au 15 juin 2007 ; rangings 2007.

développement des centres urbains, ce qui réduit les espaces cultivables entraînant des problèmes fonciers et la surexploitation du sol. A cela s'ajoute non seulement les problèmes de mauvaises pratiques culturales mais aussi ceux relatifs à la destruction des aires protégées tels que les forêts, les rivières et les parcs nationaux. Les effets du changement climatique sont très visibles en RDC, cela se manifeste notamment par

- La modification du climat à travers le pays
- La montée de la sécheresse dans certains endroits jadis fraîches
- La diminution du débit de certains cours d'eau
- Etc.

Bref le changement climatique affecte considérablement la RDC comme il en est le cas dans d'autres pays du monde. La question du changement climatique retient donc l'attention de certains dirigeants et des initiatives sont entrain d'être faites dans le cadre soit de l'adaptation au changement climatique, soit à l'atténuation des ses effets.

Ainsi la FOPAC/NK a, dans le cadre de faire face aux effets du changement climatique, entrepris une action en faveur des paysans du territoire de Rutshuru en province du Nord-Kivu

Contexte économique de la province du Nord-Kivu

L'économie du Nord-Kivu repose sur le secteur primaire : agriculture, élevage, pêche, forêt et mines qui intervient pour 49,7% du PIB provincial, résorbant à peu près 80% de la population.

Dans cette province, l'agriculture occupe environ 80% de la population estimée à 6.000.000 d'habitants. Le budget national accorde à ce secteur à peine 3% de son enveloppe durant les dernières années.

Les principaux problèmes qui pèsent sur ce secteur sont d'une part exogènes. Les politiques économiques appliquées par les différents gouvernements n'ont pas permis le développement de l'agriculture en valorisant les potentialités existantes. Elles ont plus accordé l'intérêt au secteur minier.

L'environnement macro-économique a aussi constitué une contrainte non négligeable au développement agricole.

L'agriculture industrielle est en souffrance avec le d'écimage du caféier Robusta par la trachéomycose, les viroses de la papaye. Beaucoup de plantations sont alors abandonnées depuis des années.

L'élevage du gros bétail a été pillé pendant la guerre. L'exploitation artisanale du Lac Edouard ne permet pas de valoriser son potentiel halieutique pendant que le Lac Kivu est peu poissonneux

Le Nord-Kivu comme tout le reste de la République Démocratique du Congo est en sortie d'une longue guerre qui a affecté de différentes façons l'agriculture, il y a lieu de noter la dégradation des infrastructures notamment le système de transport et les voies de communication ainsi que les déplacements intérieurs des populations.

L'aide alimentaire en période de conflits a aussi accru les importations des produits agricoles exerçant une influence négative sur la production locale.

Au niveau interne, l'absence d'un cadre institutionnel adéquat pour définir, orienter, coordonner, évaluer et rectifier les initiatives a fragilisé l'agriculture.

L'agro-industrie est peu développée surtout avec la fermeture des usines de traitement du café, de la Minoterie de Kihemba qui d'ailleurs étaient privatisées. Actuellement des unités de transformation du maïs en semoule sont implantées dans les grandes agglomérations pour répondre aux demandes du PAM mais aussi de la population locale qui a intégré la consommation du fufu de maïs dans le régime alimentaire (Minoterie du peuple, Maizeking, Minoterie Akili, Maizerie de la COOCENKI, etc.). La production locale des jus des fruits, des sirops, des vins, des purées, des eaux minérales se développe de plus en plus mais exige un approvisionnement en emballages en plastique ou en verre et dépend encore de l'énergie thermique faute de barrages hydroélectrique (Maison Takengo, Kalmango, PAORA, Kivu Maji, SEDAK, etc.)

L'artisanat est aussi peu développé autour des petits garages, des moulins, des ateliers de réparation des appareils électroménagers, de la vannerie, la tannerie, la poterie, etc. Le Groupe des artisans de Butembo (GAB) fabriquent des outils et des machines de production et de transformation des produits agricoles, ainsi que de microcentrales hydroélectriques. Le GAB intervient dans la promotion de l'artisanat utilitaire par l'écoute des besoins en équipements des producteurs agricoles et industriels ; la conception et la fabrication des prototypes d'outils et machines visant la satisfaction de ces besoins.

Les ressources minières identifiées sont l'or, le Coltan, le Diamant et le Wolfram dont l'exploitation reste artisanale.

Au niveau du secteur tertiaire, on note une prépondérance du commerce informel basé sur la distribution des produits vivriers locaux à travers un réseau complexe d'opérateurs.

Les échanges avec l'extérieur se font autour du café, du bois et des minerais qui procurent des recettes en devises.

L'importation porte sur les biens de consommation (produits alimentaires et manufacturés).

3. DESCRIPTION DE L'ACTIVITE

Il s'agit d'une activité faisant partie du projet d'appui stabilisation des ménages déplacés et retournés victimes des conflits armés dans le territoire de Rutshuru qui avait comme objectif de distribuer des herbes fixatrices (tripsacum) à 130 ménages victimes des éboulements et des érosions dans les villages de Kashalira et Katolo se trouvant dans la chefferie de Bwito en territoire de Rutshuru à raison de 200ml de boutures par ménage. Ainsi après 3 mois de plantation de ces boutures, les champs ont été protégés. Comme le projet avait comme philosophie le remboursement, les premiers bénéficiaires ont commencé à rembourser les boutures au profit d'autres ménages victimes de cette catastrophe dans le même village.



4. DEBUT DE L'ACTIVITE

L'activité à commencé en octobre 2009 avec la distribution des ces tripsacum et pour le moment les autres paysans ont commencé à appliquer cette technique de lutte antiérosive.





Le projet est exécuté par la FOPAC/NK en partenariat avec Oxfam Solidarité Belgique qui a son bureau de liaison à Bukavu

5. BAILLEUR DE FONDS

Le projet est financé par le gouvernement belge



6. BENEFICIAIRES

Les ménages victimes des conflits armés dans le territoire de Rutshuru

7. IMPACT ET TEMOIGNAGE/ADAPTATION

- Plus assez d'érosion dans les champs des paysans
- Disponibilité des herbes fixatrices dans les villages
- Compréhension de l'importance de la lutte antiérosive par les paysans

Une paysanne du nom de Kahamu Matofali rencontrée dans la cité de Kiwanja explique : « Avant cette initiative que la FOPAC a entreprise en notre faveur, nos champs étaient chaque fois érodés et la production devenait conséquemment problématique. Cependant, cette action nous a beaucoup aidé car maintenant les agriculteurs savent protéger leurs champs et par conséquent nous avons commencé à maîtriser la production ».

8. IMPACT ET TEMOIGNAGE/SECURITE ALIMENTAIRE

- Les petits producteurs ont commencé produire davantage plus qu'ils ne le faisaient avant
- La production actuelle commence petit à petit à couvrir les besoins en nourriture pour les paysans et leurs familles
- Une quantité de la production est commercialisée pour la couverture d'autres besoins de la famille et plus précisément il s'agit des excédents de production qui sont commercialisés tel que nous a expliqué monsieur Jean Baptiste, paysan bénéficiaire de cette initiative , que nous avons rencontré dans la village de kibirizi : « Pour le moment nos famille n'ont pas assez de problème de nutrition , les enfants mangent à leur faim dans les ménages et selon les statistiques des services de santé en territoire de Rutshuru, la mal nutrition a diminué d'au moins 3% ».

9. COUT-EFFECTIVITE

L'activité est vraiment bien effective d'autant plus que les paysans continuent à appliquer la technique de lutte antiérosive tel que la FOPAC a enseigné ; cependant, il faut assez de moyens pour que cette activité. L'initiative dont il est question dans cette étude de cas n'était qu'une partie d'un projet. Seule cette activité a couté plus

de 5000\$USD .

10 PARTICIPATION PAYSANNE

La population s'est vraiment approprié l'activité d'autant plus qu'après la distribution des herbes fixatrices ils se sont personnellement occupés de l'activité. Les paysans continuent eux-mêmes de reprendre cette technique dans d'autres villages

11 DU RENFORCEMENT DES PARTIE PRENANTES

Les parties prenantes et les bénéficiaires de cette activités ont subi une formation en technique de conservation de l'environnement qui a réuni 615 participants dont 315 hommes et 300 femme. La formation a été organisée en novembre 2009.

Ainsi, les bénéficiaires et les parties prenantes détiennent une expérience suffisante en terme de protection de l'environnement.

12 DU TRANSFERT DE TECHNOLOGIE

La pratique de lutte antiérosive par la plantation des herbes fixatrices est facilement applicable dans toute autre région ou pays car il n'y a pas de technologie compliquée pour cette activité; il suffit que la région soit favorable à la poussée du tripsocum. Au niveau du territoire de Rutshuru, la pratique est adaptée aux capacités et aux savoir-faire des paysans.

Cashew Introduction to the lowland areas in Ethiopia (OCFCU)

Was initiated by: **OCFCU (Oromia Coffee Farmers Cooperative Union)**

Is supported by: **CFCP (Common Fund for Commodities Project)**

Context: Brief presentation of the climate change challenges / issues faced by smallholder farmers before the initiative

Small holder farmers rely on rain fed agriculture. The average size of land holding is below 1 ha / household, which is not enough to produce adequate production even to feed the family. The lowland area is categorized as moisture deficit since the rain fall distribution is characterized by great year to year variability and continuous shortage of rain with rain fall below average that leads to sequences of droughts which cause a farming crisis with food shortage.

It is characterized by high rate of environmental degradation due to ever increasing pressure on marginal lands. Soil degradation is observed by loss of soil through run – off, wind erosion and poor farming system. Farmers apply very few natural resource conservation and management practices.

During the past decades wood cutters, charcoal makers and those who practice land clearing have destroyed forest trees and shrubs in a senseless manner. Most charcoal demand has been met by production particularly from Acacia species, which were densely found in the lowland area.

In general, due to the alarming rate of population growth, high resource depletion especially deforestation and soil degradation are the common threats against the natural resources.

Description of the initiative (Has been in operation since ..., nature of the initiative, etc)

Cashew introduction to lowland areas has been implemented in 8 target areas of the

Oromia Region namely: Fentale, Adama, Adamitulu, Bakogutu, Gida, Gutowayu, Kabena and Cheha Districts for a period of 5 consecutive years since 2005 and phased out by the year 2009.

The CFCP has been providing financial and technical assistances to the OCFCU through RCINESA



Figure 22: Cashew nut tree in Ethiopia

(Regional Cashew Improvement Network for Eastern and Southern Africa) for ensuring sustainable development through contributing towards poverty reduction of the national economy.

Its main objective is to improve local environmental quality in the form of improving agro-eco systems preventing soil erosion by water, wind, flooding climatologically balance carbon sequestration and its potential in

mitigating global warming caused by green houses in the atmosphere.

This broad objective calls for the achievement of specific project activities, notably: identify suitable trial sites & plant with selected improved material, establish village/farmer nurseries & cohesive farmer groups and conducting training programs for farmers, extensionists, traders, government officials, etc

Describe the impact / effectiveness of the initiative in terms of mitigating the effects of climate change or adapting to the effects of climate change:

Cashew nut (*Anacardium occidentale*) belongs to the family Anacardiaceae that includes among others the mango fruit and pistachio nuts. It is an ever green perennial crop with wide leaves and ensures climatologically balance through carbon sequestration and its potential in mitigating global warming caused by green house gases in the atmosphere.

As smallholder crop, cashew can grow as a mono-crop or intercropped with food crops such as maize, sorghum, sesame, beans and others. The integration of cashew in the farming systems will minimize the clearance of large segments of land, thus mitigate

potential negative impacts on the environment. Cashew is a valuable tropical cash and food tree crop that can grow in marginal lands. It stabilizes the soil and is a source of fuel wood. The crop is often used for reforestation and agro – forestry development. The additional tree cover provided by cashew plantations help to

alleviate pressure on the local vegetation and increase soil fertility by improving moisture retention, soil structure and nutrient content, which helps to mitigate the effects of drought and desertification.

Describe the impact / effectiveness of the initiative in terms of ensuring food security by smallholder farmers:

Cashew is an important nut crop that provides food, employment and hard currency to many in developing nations. The plant produces not only the well – known nut, but also a pseudo-fruit known as the cashew “apple” and cashew nut shell liquid (CNSL) which is used for industrial and medicinal purposes. The kernels or nuts have a high nutritional as well as commercial value and are used for human consumption either raw or roasted. The cashew nut apple is rich in Vitamin C (About 5 times higher than the orange) and is used for production of juice, wines, spirits, jam, pickles and chutneys. The liquid of the shell is used for brake linings, heat proof and water proof paints and protective vanishes.

Social impacts of cashew cultivation emanate from group formation for cashew production, processing and nursery operations. This will successively lead to increased opportunities for:

- Employment in the rural areas,
- Income generating among the vulnerable smallholder farmers and women,
- Participation in collective income earning operations, and,
- Accessing credit.

All of these opportunities will ultimately result in increased household income and improvement in rural living conditions, hence contribute to poverty reduction.

Make an assessment of the cost – effectiveness of the initiative:

The initiative is cost – effective as a result of:

- As a tripartite partnership approach (CFCP, OCFCU with beneficiary community & local government) is already set, no need to establish parallel structures to implement the initiative.

- Participation of the main stakeholders built actor's skills and capacities, increased the accuracy of information, ownership of the development process and better use of resources.
- Building effective partnerships enabled the project to pull resources together, harness synergies and benefit from complementary human and technical resources.
- Establishing networking with in the country and working with them has contributed a lot to facilitate the sharing of experience and improve the quality of the initiative. Sharing experience with like minded NGO's, cooperative unions, research centers, academic institutions and the private sector have been implemented to realize the cost – effectiveness of the initiative.

How participatory is the initiative? What is the role of the stakeholders (e.g. Farmers, FOs, others?) Who drives the process?

The project has put great emphasis on the involvement of stake holders as participation is a human right and an inherent and indivisible component of project implementation approaches and strategies.

In line with this, all concerned bodies and the beneficiary community were actively involved in need assessment, planning, implementation, monitoring and evaluation.

Stake holder's role

Stakeholder	Role
Cooperative Societies at all level OCFCU	<ul style="list-style-type: none"> - Drives the process, the General Manager of the OCFCU is currently leading the initiative at country level. - Monitoring and evaluation
Funding organization CFCP	Provides financial and technical support
Research organizations RCINESA EARA (Ethiopian Agricultural Research Agency)	<ul style="list-style-type: none"> - Introduce / import cashew germplasm, pre basic and basic seeds - Promote and distribute cashew planting material - Awareness creation and training

	<ul style="list-style-type: none"> - Technical support - Monitoring and evaluation
Government Organization Zonal and District Agricultural and Rural Development Offices	<ul style="list-style-type: none"> - Organize and strength cohesive farmer groups - Build their capacity in training and provide technical support - Extension services for cashew growers - Monitoring and evaluation
Beneficiary farmers Private sector / Investors	<ul style="list-style-type: none"> - Participate in production, processing and marketing of Cashew - Monitoring and evaluation

Have beneficiaries / stakeholders been empowered by taking part in this initiative?

- **The capacity and skill gaps of the government and beneficiaries are identified. A key activity area of the project is building the capacity of government staff and community self-help and self-management skill. At the moment, all actors are in position, well trained and motivated to carry out their work and responsibilities.**

Can this initiative be easily replicated to another region or country? Is the technology transferable or adaptable to context and circumstances? What are the main conditions or success factors for replicability?

Yes, it can be scaled up and replicated across the country for the following reasons:

- **A significant number of trees are well performed, started flowering and producing kernels and apple with in short period as compared to other fruits such as mango and avocado. As a result of this and a number of other positive characteristics of the crop, both the farmers and the government of Ethiopia have developed interest and a**

strong commitment for further popularization and promotion of the crop in areas having similar agro climatic condition across the country.

- **As the initiative is formulated by recognizing the national policy of the country, it is consistence with the government development strategies of food security in particular and poverty reduction in general. Hence, the government support could be strong in extending effective extension services for producers, commercial incentives for processors and pledges to start and strengthen research and development services to materialize successful cashew production in the country.**
-

Vulgarisation de la loi Fonciere et a loi sur la Protection de l'Environnement au Rwanda (IMBARAGA)

PAYS : RWANDA

REGION : PROVINCE DU NORD

INITIE PAR : RWANDA FARMERS FEDERATION IMBARAGA

SOUTENU PAR : LE GOUVERNEMENT DU RWANDA ET LES ONGs (RCN et CARE International)

1. Contexte

Le Rwanda est un petit pays montagneux à pentes très raides principalement dans le Centre, le Nord et dans le Sud. Suite aux changements climatiques, certains espèces végétales qui existent dans la région ont commencé à disparaître au cours de 30 dernières années; d'autre part, certains insectes dont les pucerons les moustiques qui n'existaient pas dans la région menacent actuellement la population (malaria) et les cultures (dégâts causes par les pucerons). Depuis ces 5 dernières années, on enregistre presque chaque année la perturbation du calendrier cultural due aux effets du changement climatique.

Les politiques et les lois en relation avec la protection et la conservation de la biodiversité ont été adoptées par le gouvernement Rwandais mais elles sont mal connue par la population rurale.

Même si ces lois sont très favorables à la réduction des effets des changements climatiques, elles restent dans les tiroirs et n'étaient pas connues du grand public.



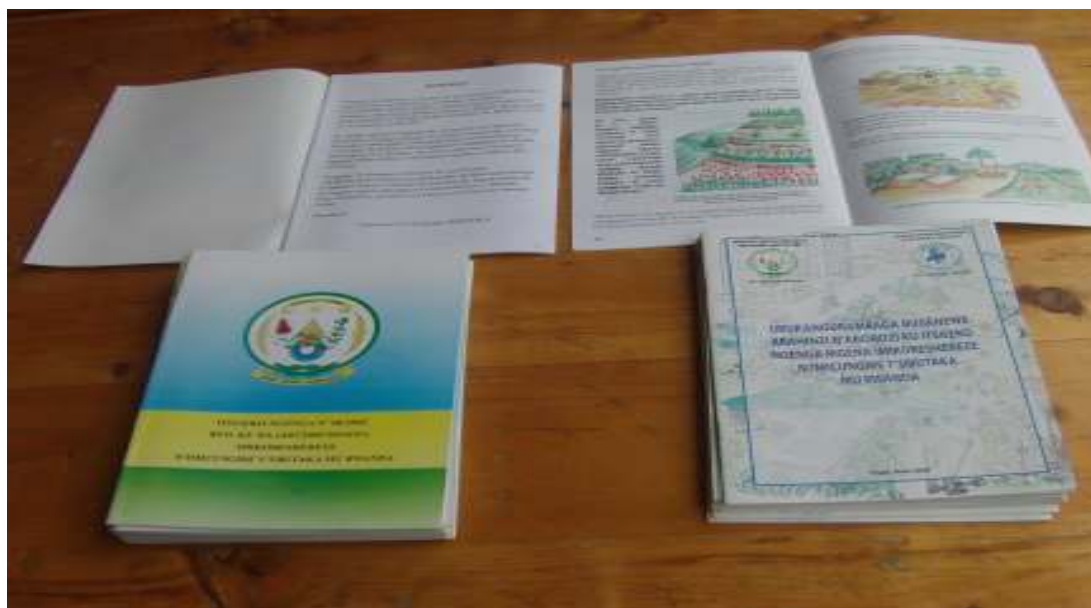
Réhabilitation du Lac RUHONDO qui était en voie d'assèchement

IMBARAGA a saisi l'occasion pour vulgariser ces lois pour que les droits et les devoirs des citoyens en rapport avec la protection de l'environnement soient connus et sauvegardés.

2. Description de l'initiative

La vulgarisation de la loi foncière a démarré au Rwanda en 2006 dans le district de Musanze. Toute la population est concernée mais le groupe cible est particulièrement les agriculteurs et les éleveurs et d'autres personnes plus impliquées dans les questions foncières dont les Conciliateurs et les vulgarisateurs agricoles.

L'activité consiste en la reproduction et diffusion des documents ; et en l'organisation des ateliers de formation et vulgarisation des lois et politiques agricoles et environnementales avec l'autorisation du Ministère ayant les terres dans ses attributions.



Livret sur la Loi organique foncière

Guide d'explication de la Loi organique

- L'identification des leaders paysans capables de dispenser la formation reçue auprès de leurs camarades illettrés qui habitent dans le même village ;
- Elaborer un guide qui illustre et explique les articles les plus difficiles à comprendre par les paysans. Ceci exige même les dessins pour faciliter la compréhension ;
- Différentes formations sur le contenu de ces lois : droits et obligations des utilisateurs de la terre dans le cadre de la gestion des terres, punitions réservées aux personnes qui ne respectent pas la loi ;
- Vulgarisation de la loi et politiques en relation avec le foncier et la protection de l'environnement.

3. Impact et efficacité de l'initiative sur le changement climatique

- La protection du sol par la lutte antiérosive est passée de 40 à 70% car les gens savent maintenant que c'est une obligation (érosion diminuée) ;
- Le nombre des femmes qui protègent les terres a sensiblement augmenté car elles savent qu'elles ont les mêmes droits que les hommes sur la terre en matière d'héritage et succession ;
- Les exploitants des terres entretiennent correctement les terres car ils savent que maintenant ils ont le droit de vendre, d'hypothéquer en banque,... contrairement à ce qui se passait avant.

- Les activités de déforestation et autres qui ont des effets négatifs sur l'assèchement des lacs et cours d'eau naturels (cultiver les bassins versants) ne sont plus pratiquées ;
- La forêt naturelle des Volcans (Virunga) n'est plus détruite comme avant puisque la population a été formée et sensibilisée (Burera) sur les avantages des forêts par rapport aux changements climatiques.

4. Impact de la vulgarisation de la loi foncière sur la sécurité alimentaire



- L'exploitation raisonnée des terres protégées a permis d'augmenter la production. A titre d'exemple, la production de maïs est passée de 1000 tonnes (avant l'initiative) à 6000 tonnes après la formation dans le district de Burera. Cela a contribué à assurer la sécurité alimentaire au niveau des ménages. Cette activité a été renforcée par le MINAGRI à travers programme d'intensification agricole (CIP- Crop Intensification Programme).



Champ de maïs au pied des volcans

5. Evaluation du rapport coût- efficacité de la vulgarisation de la loi foncière

La vulgarisation des lois et politiques foncières ainsi que la loi sur la protection de l'environnement auprès de la population se fait selon l'approche de formation « paysan à paysan » avec l'utilisation des livrets dans des réunions organisées au niveau de la communauté de base.

6. Rôle des principaux acteurs

Les principaux acteurs sont :

- IMBARAGA comme organisation paysanne :
 - qui a rassemblé toutes les informations relatives à la nouvelle loi foncière et celle sur la protection de l'environnement ;
 - qui a identifié les candidats formateurs remplissant les critères exigés ;
 - qui a organisé les formations des formateurs (leaders paysans membres d'IMBARAGA et Conciliateurs) ;
 - qui a organisé des formations/sensibilisation au niveau des communautés de base (Villages).
- Le Gouvernement Rwandais à travers le Ministère des terres dans ses attributions :
 - Rendre disponibles les informations dont on besoin ;
 - Accepter le partenariat dans la reproduction et multiplication des livrets ;

- Donner des appuis- conseils à la Fédération IMBARAGA.
- RCN « Justice et Démocratie » et CARE International :
 - Apport des fonds pour l'achat des livrets et la rémunération des consultants/formateurs (spécialistes).

Cette activité qui a débuté dans le District de MUSANZE en 2006 vient de toucher plusieurs ménages et elle vient actuellement de se répandre dans 24 districts du pays.

7. Rôle des bénéficiaires

Environ 15,600 personnes viennent d'être formées dont 85% sont des agriculteurs qui vivent de ce métier. Ceci grâce aux bénéficiaires de la première séquence des formations qui ont, à leur tour, formé leurs camarades au niveau de la base.

8. Possibilité d'extension de l'initiative

Cette initiative a déjà été répliquée dans d'autres régions du pays et a connu beaucoup de succès. Sa réussite est conditionnée par la disponibilité de moyens financiers et la collaboration avec les autorités administratives au niveau de la base.

Cas Adoptés par les Agriculteurs Pour Lutter Contre les Changements Climatiques au Rwanda (INGABO)

Au Rwanda, vu la faible capacité actuelle d'adaptation au changement climatique attribuable à un niveau de pauvreté élevé, à des sécheresses et des inondations récurrentes, à la forte dépendance vis-à-vis de l'agriculture non irriguée, à une crise énergétique grave qui entrave le développement humain, le renforcement de la capacité d'adaptation nécessite l'intégration des mesures d'adaptation au changement climatique dans les stratégies globales de développement durable.

Le Rwanda demeure l'un des pays les plus densément peuplés au monde, avec une estimation de neuf millions d'habitants sur 26 338 kilomètres carrés et un taux de croissance démographique de 3,1 pour cent par an, ce qui le rend vulnérable à l'insécurité alimentaire.

Le Rwanda a enregistré une amélioration importante de sa sécurité alimentaire à la suite des mesures gouvernementales prises pour monter la production agricole en 2009, selon des responsables.

Le gouvernement a mis en place une nouvelle stratégie agricole, qui **inclut une distribution aux moments opportuns de semences et d'engrais, l'adoption de méthodes de production orientées vers la commercialisation et l'encouragement aux fermiers à consolider la terre.**

« La distribution au moment opportun d'intrants agricoles comme des engrais ainsi que des semences améliorées et un programme de consolidation de la terre a stimulé le secteur en 2009 », selon un rapport du Rwanda Agriculture Development Authority, géré par le gouvernement, sur le Programme d'intensification agricole.

Selon des responsables de l'agriculture la stratégie, couplée avec des méthodes agricoles d'amélioration des récoltes, stimule la production de produits alimentaires majeurs comme le maïs, les pommes de terre, le manioc et le riz, soulageant ainsi les régions autrefois sujettes à la famine.

L'objectif du gouvernement est de mettre à terme à la dépendance vis-à-vis des biens alimentaires importés en augmentant la production locale. « Nous avons la terre, les ressources physiques et humaines pour atteindre cet objectif », a dit la Ministre de l'Agriculture et des Ressources Animales.

Selon les chiffres du Rwanda Agriculture Development Authority, la production de maïs en 2009 est passée à 286 948 de tonnes contre 166 853 Tonnes en 2008, pendant que

la production de blé atteignait 72 478 Tonnes contre 67 868 Tonnes en 2008. Durant la même période, la production de pommes de terre a augmenté, passant à 1,3 million Tonnes contre 1,1 million Tonnes, et la production de riz a atteint 95 105 Tonnes contre 82 024 Tonnes en 2008.

1. Irrigation

Dans le cadre du Programme d'intensification agricole, l'accent a été mis sur des méthodes agricoles comme le paillage et l'irrigation, afin de mettre fin à la dépendance vis-à-vis des schémas météorologiques changeants. Les fermiers ont aussi été découragés de cultiver des petites parcelles fragmentées et, selon des officiels, la pratique a été particulièrement bénéfique pour les cultivateurs de maïs dans la province Ouest, qui cultivent maintenant dans de grandes plantations, sur une base communale.

« Le rendement moyen de maïs dans la province tourne maintenant autour de sept tonnes métriques par hectare, contre une moyenne de quatre tonnes métriques il y a deux ans », a dit Paul Munyakazi, un chercheur associé à USAID (l'Agence des Etats-Unis pour le développement international) dans la province.

Concernant l'irrigation, les fermiers n'utilisaient pas correctement les ressources en eau, principalement à cause de technologie inappropriée et de manque de financement. Les récoltes bénéficiant de l'irrigation sont celles qui sont cultivées dans des zones à basse altitude, comme le riz.

2. Contrôle de l'érosion

Le succès du programme agricole du gouvernement est dû principalement aux efforts rigoureux de contrôle de l'érosion.

Les fermiers ne sont pas autorisés à élever du bétail sur les versants des collines (maintenant le gros bétail est enfermé dans des étables) ; ce qui a contribué à maintenir l'intégrité des terrasses. Plus important, les gens réalisent maintenant qu'il n'est pas suffisant de ne pratiquer que l'agriculture de subsistance.

De part l'élevage en stabulation permanente, on préconise **la promotion u biogaz à base de la bouse de vache, afin de lutter contre la déforestation massive par le bois de chauffage.**

L'objectif du Rwanda est d'augmenter [la surface] de terres en terrasse à 1 000 400 hectares d'ici la fin 2010, contre 193 735 hectares à la fin de 2009.

3. Prix des aliments

Selon l'Institut National de la Statistique, l'amélioration de la production de nourriture en 2009 a stabilisé les prix des aliments depuis le mois de septembre. Le maïs, le manioc, les pommes de terre, les haricots et les pois sont restés stables, certains prix baissant même légèrement.

Seules les bananes ont enregistré une hausse des prix en septembre, en raison de l'effet dévastateur de la maladie du flétrissement de la banane.

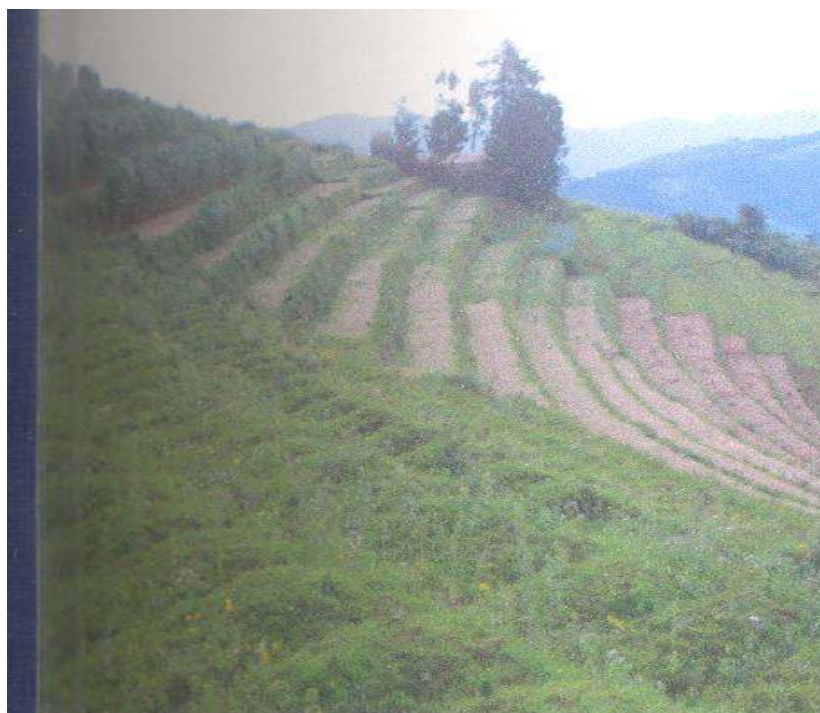
4. Interdiction des sachets plastiques

Le gouvernement rwandais interdit toute utilisation des sachets plastiques, car, non dégradables et ainsi jouent un rôle dans le changement climatique.

5. Production du carburant

Depuis 2008, l'Institut Rwandais de Recherche Scientifique et de Technologie (IRST) a produit du carburant bio fuel à base de la culture JATROPHA, qui ne dégage pas de gaz nuisibles pour l'environnement. Depuis 2008, quelques autobus ont commencé à le consommer en guise d'essai.

1. Terrasses radicales



2. Creusement des fossés antiérosives



3. LES VERSANTS DES COLLINES



Les fermiers ne sont pas autorisés à élever du bétail sur les versants des collines dans le cadre des efforts de contrôle de l'érosion (photo d'archives)
