

# CAPITALIZATION OF GOOD PRACTICES AND SYSTEMS OF LOCAL GOVERNANCE FACE TO THE CHALLENGE OF CLIMATE CHANGE



In Sub-Saharan  
**Africa**



# **CAPITALIZATION OF GOOD PRACTICES AND SYSTEMS OF LOCAL GOVERNANCE FACE TO THE CHALLENGE OF **CLIMATE CHANGE****

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# Preface

Africa, and in particular sub-Saharan Africa (SSA), is one of the most vulnerable regions to climate change, with a high likelihood that global warming there will exceed the COP21 target of keeping the global average temperature increase below 2°C by the end of the century (IPCC, 2014). Temperature increases in SSA, relative to the 20th century average, ranged from 0.3°C to 1.5°C depending on the region in 2017, compared to 1°C globally. On average, over 2001-2017, annual rainfall has also decreased compared to the 20th century<sup>1</sup>.

In sub-Saharan Africa in particular, under the effect of climate change, some areas are experiencing droughts, floods, more storms that disrupt agricultural and livestock production. The countries particularly concerned are the countries of the Sahel (Burkina, Mali, Senegal, Niger, Chad, Mauritania) but also some areas of Tanzania, Kenya, Cameroon, Ethiopia, Côte d'Ivoire. Floods, in addition to the devastating effects on crops, cause losses in livestock (poultry, small ruminants and livestock washed away), destruction of habitats, destruction of social infrastructure (schools, health centers, portable water supply systems), displacement of populations and sometimes deaths. Drought has similar consequences with the reduction in the availability of arable land, the spread of bushfires with its corollaries of environmental destruction and impacts on entire communities.

Understanding the climate system and current and future changes, whatever their form, is fundamental. It allows us to grasp the extent of the challenges and to imagine the appropriate responses to be provided in the various fields. Some responses are already being given in terms of measures taken by the players to cope with the effects of climate change. It is in this perspective that this important contribution of Inades-Formation and its partner from the North, the Basque Agency for Cooperation and Development (ABCD), which results from the implementation of the project for the capitalization of good experiences of the resilience of African populations to the challenges of climate change.

By choosing to capitalize and disseminate the experiences of different actors in Africa in adaptation and resilience to the effects of climate change, as a field of investigation, the work stands out for its relevance and originality. It is precisely in this area that the necessary actions are sorely lacking.

With the rigor and caution that characterize any scientific approach, this publication provides a clear, simple and pedagogical understanding of the specific complexity of climate change and the construction of adequate responses.

This work also points out the lessons learned from this capitalization as well as the perspectives for structuring actions.

<sup>1</sup> Bulletin/Newsletter of the Bank of France, 230/4; July-August 2020

This remarkable work, the result of a vast and fruitful cooperation with the Spanish partner and an interdisciplinary approach, identifies the diversity of experiences and the need to conduct real advocacy actions to enable Civil Society Organizations to invest in the spaces of exchange and debate on the climate issue.

This book is an important contribution for decision-makers, particularly at the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change. This conference should lead to important decisions on ambitious plans to reduce greenhouse gases

(GHGs) by 2030 and to decarbonize the world economy to achieve carbon neutrality by 2050, new solutions for adaptation and strengthening resilience to the effects of climate change and the mobilization of financing through the Green Climate Fund to support climate action. It will certainly mark a historic turning point in the climate negotiations and in the fight against climate change.

This book is undoubtedly a major contribution to the improvement of this knowledge.

**Sena Kwaku ADESSOU, Secretary General of Inades-Formation.**

# Foreword

Capitalising on experience requires a professional commitment and a spirit of sharing. Information and training are the foundations of human development. It is in this respect that Inades-Formation appreciates the importance of the support provided by the Basque Agency for Cooperation and Development (ABCD). This is an opportunity for Inades-Formation to pay a warm tribute to this partner, which spontaneously agreed to provide financial support for this initiative, demonstrating its sensitivity and commitment to supporting alternatives for resilience to climate change.

Indeed, through this project piloted over the period 2019-2020, ABCD has made it possible to bring to light some living realities about community efforts to combat the problems posed by climate change in Africa.

Our thoughts go especially to Ms. Marlen Eizaguirre Marañón, ABCD's International Cooperation Project Officer, for her technical support throughout the implementation of the project. Her

pertinent advice during the periodic exchanges was of great interest to us.

We hope that by sharing these experiences, we can scale up efforts on the African continent. The challenge of climate change remains immense. This is also an opportunity to call on our partners to further support the scaling up of our achievements and the ongoing professionalisation in the face of persistent challenges.

Inades-Formation would also like to thank the 158 experience-bearers from 11 African countries, namely Burkina Faso, Senegal, Côte d'Ivoire, Togo, Cameroon, Chad, Burundi, Rwanda, Kenya, Tanzania and the DRC, who were willing to share their interesting experiences developed in their respective communities.

Inades-Formation counts on their commitment to the common good for the dissemination and exploitation of the knowledge they will discover in the document.

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# 0 - INTRODUCTION

## 0.1- Context and Challenges of the Experience Capitalization in the Face of the Climate Change and Associated Local Governance Challenges

The development of sub-Saharan Africa is confronted with international issues, among which climate change and associated governance are two major problems that this capitalization wanted to address from a local and regional perspective.

The effects of climate change are visible in many areas of Sub-Saharan Africa. The most affected countries are those close to the Sahel, notably Burkina Faso, Mali, Senegal, Niger, Chad and Mauritania. But the problem also affects certain areas of Tanzania, Kenya, Cameroon, Ethiopia, Côte d'Ivoire, etc.

Droughts, floods and high temperatures are severely damaging agricultural crops and livestock in these areas. Their effects are devastating on livestock and crops but also have parallel impacts on habitats and social infrastructures.

The reduction of cultivable land, the spread of fires, the destruction of the environment and community resources have also lead to population displacement and in some cases even loss of life.

Climate change increases the risk of violent conflicts due to the degradation of people's livelihoods, migration and human and livestock mobility. Specifically, climate change has produced nearly 10 million environmental refugees (eco-refugees) in these areas. And the forecasts, if no measures are taken to mitigate its impacts, are very discouraging.

Inades-Formation works in the countries most affected by climate change through initiatives geared towards the valorization of local knowledge and practices for adaptation to climate change. Inades-Formation also works on inclusive governance systems associated with its areas of intervention, notably through agro-ecology, natural plant treatments, the manufacture and use of organic fertilizers, the fight against erosion, community management of natural resources, the promotion of low energy consumption models and the use of renewable energies, the establishment of rainfall monitoring systems to identify the right time for sowing, etc.

The realities in Africa show various initiatives developed by the populations to face the problem of climate change, both in terms of good field practices and associated local governance mechanisms. Since sharing experiences is a powerful way to contribute to the development of these initiatives, the General Secretariat of Inades-Formation, with the technical and financial support of the Basque Agency for Cooperation and Development (ABCD), has conducted the project of study-capitalization of good practices in the face of the challenges of climate change and local governance in Sub-Saharan Africa. To this end, it has identified, in the countries, actors carrying good practices in (i) resilience to climate change and (ii) inclusive local governance and territorial development, with particular emphasis on the experiences of rural women.

This pilot project was directed towards Burkina Faso, Senegal, Togo, Côte d'Ivoire, Benin, Chad, Cameroon, the Democratic Republic (DR) of Congo, Rwanda, Burundi, Tanzania, Kenya and Ethiopia.

The objective was to stimulate and support the capitalization of experiences in mitigating the impacts of climate change, adaptation and resilience of populations to the challenges of this phenomenon and inclusive rural governance, in order

the impacts of climate change. The implementation focused on the following three main components:

- Identification of experiences related to impact mitigation, adaptation and resilience of populations to climate change and inclusive rural governance,
- Training in the capitalization of the experiences of the identified actors-performers in order to enable them to turn these experiences into knowledge



## REGIONAL WORKSHOP ON METHODOLOGY AND TOOLS OF CAPITALIZATION EXPERIENCES IN MATTER OF RESPONSES TO CLIMATE CHANGE CHALLENGES

**KIGALI, FROM 1ST TO 4TH OCTOBER 2019**

to allow the emulation and scaling of these experiences in sub-Saharan African countries.

At least 50 experiences on different themes were required. The challenge was also to mobilize as many potential actors as possible in the search for alternative solutions to the problems of climate change and associated local governance.

In concrete terms, the project has made it possible to identify and disseminate positive experiences implemented in the African rural area, in relation to inclusive governance and the fight against

that can be shared and to create exchange dynamics,

- The dissemination among African and Basque organizations of good practices of inclusive governance and the fight against the impacts of climate change in African rural contexts.

The products of the capitalization constituting means to stimulate learning on a large scale among populations living the same realities, another challenge of the project was to create in the same framework, mechanisms of exchange of experiences between the various actors identified in the framework of the project.

## 0.2- Working Methodology and Grouping of the Experiences Obtained

The capitalization process began with a dynamic of discovery of potential actors with shareable experiences in the 13 intervention countries.

After setting up a steering committee comprising representatives of Inades-Formation and the Basque Agency for Cooperation and Development (ABCD), a gender-inclusive scientific committee was set up with the involvement of people from outside Inades-Formation in addition to the internal team, to ensure greater relevance and hindsight in the management of the project.

A call for proposals was launched and distributed through different channels to the different target countries. This resulted in 158 experiences from 58 actors, including cooperatives, umbrella farmers' organizations, NGOs and public institutions. On the basis of selection criteria included in the terms of reference of the call for proposals, 50 experiences were finally selected. They are carried out by 39 actors in 11 African countries, namely Senegal, Burkina Faso, Côte d'Ivoire, Togo, Chad, Cameroon, the Democratic Republic of Congo (DR Congo), Rwanda, Burundi, Kenya and Tanzania.

Subsequently, the selected actors received training on the methodology for capitalizing on experiences. This made it possible to create more coherence in the collection of information and documentation despite the diversity of themes.

These themes are as follows:

- Moisture conservation, water collection and management;
- Alternatives to the massive use of firewood;
  - Manufacturing and use of substitutes for firewood and charcoal;
  - Manufacture and use of energy saving stoves/kitchens;
- Adoption of climate change resistant seeds/crops and breeds;
- Renewable energy for irrigation;
- Protection system against high ocean winds;
- Farmer-based climate information system;
- Agro-forestry and sustainable land management systems;
- Concerted mechanisms for the management of village and inter-village forests and nature reserves;
- Community-based early warning mechanisms against climate-related disasters;
- Citizen education and awareness on climate change response measures;
- Local governance mechanisms for the agro-ecological transition;
- Local governance mechanisms for dry season livestock transhumance.

Ten experiences have been selected to be documented in audiovisual format. The project foresees a wide communication that should continue beyond its implementation period.

### 0.3- Presentation of Experiences by Categories and Themes

The experiences are presented in two main chapters :

**Chapter 1 :** Experiences related to good practices in the face of the climate change challenges

In this first chapter we publish 31 experiences :

- Fourteen experiences that show practices related to soil moisture conservation through water harvesting and management or planting agro-forestry species for greater plant resistance to drought or rehabilitation of degraded lands;
- Seven present alternatives to the massive use of firewood, such as the manufacture and use of substitutes for firewood and charcoal and the use of energy-saving stoves/kitchens;
- Four experiences focus on practices to preserve and promote local genetic heritage through the adoption of local seeds/crops resistant to climate change;
- Four promote renewable energy technologies for irrigation;
- Two experiences are on community-based climate information systems

in the farming community to better prevent disasters and manage the effects of climate change.

**Chapter 2 :** Local governance systems for concerted management of natural resources and agro-ecological transition

Nineteen experiences are published in the second chapter of the document. They present governance systems and mechanisms put in place by local populations at the community level. These experiences include :

- Eight experiences on the concerted management of natural resources and the agro-ecological transition;
- Two experiences on the governance of local seed systems for climate resilience;
- Two experiences on the governance of local early warning mechanisms for floods;
- Five experiences on education and awareness-raising on eco-citizenship;
- Two experiences on the local governance of transhumance to guarantee the survival of livestock in the dry season.

## EXPERIENCES RELATED TO GOOD PRACTICES IN THE FACE OF CLIMATE CHANGE CHALLENGES

### 1.1 - Good practices relating to soil moisture conservation and plant resistance to drought

#### 1.1.1. Promoting zaipits and moist gardens techniques to enhance farmers' resilience to climate change in Kenya

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Climate effects on agricultural production and productivity is posing a great challenge to small holder farming communities in arid and semi-arid zones in Kenya. Faced with these challenges, farmers are continually exploring different options to improve food production through research, learning and development. Zaipits and moist gardens technologies have been established by farmer group's demonstration plots in Kitui, Machakos and Makueni Counties where Inades Formation Kenya (IFK) is working with the community.

**Zaipits** also known as planting pits are water efficient farming technology used in arid and semi-arid areas to maximize water utilization by crops. Zaipit is probably the most renowned technology which has been developed based on

indigenous knowledge. Zaipits are an innovation that addresses issues of land degradation, soil infertility and moisture retention.

Moist gardens are small establishment within a farm mainly used to provide microclimate enabling farmers to grow crops under controlled environment. It integrates soil, land and water management practices. Through establishing a moist garden, farmers from arid and semi-arid areas can grow crops otherwise suited for areas receiving heavy rainfall.

With the implementation of the experience, from 2015 to 2018, 1924 hectares have been covered in Machakos and Makueni Counties in the lower eastern region of Kenya.



## A brief description of the Zaipit technique



The first step is digging a pit of measurement 60 cm length by 60 cm width by 30 cm or 90 cm by 90 cm by 30 in the farm. However, the size can still have different dimensions depending on crop to be planted and amount of rainfall the area receives.

After digging the pit, fill it halfway with organic matter of dry leaves, maize which assists in conserving moisture content and increasing manure content as the organic matter decomposes with time. After the organic matter, the

zaipits are filled with a mixture of manure and topsoil. The ratio of the manure to the topsoil depends on the level of fertility of the topsoil. On average the ratio of manure to the topsoil is 1:3. The filled organic matter and the manure take between 20-25 cm leaving space on top for water accumulation and mulching. In case the farming is being done during the dry season are the following conditions should be complied with.

The soil is then mixed evenly. The soil is then mixed evenly. The zaipits are then irrigated in case the farming is being done during the dry season and according to the crops planted.

If the farmer is planting maize crop, a zaipit measuring 60 cm by 60 cm by 30 cm takes up five crops while those measuring 90 cm by 90 cm by 30 cm takes 9 crops.

In matter of results, promoting zaipits and moist gardens techniques in Machakos, Kitui and Makueni counties have produced following significant improvement in agricultural results.

In matter of harvest rainwater, the small pits acts as micro catchments that collect water and sediment. The soil placed in each pit enhances their water harvesting function since it is loose.

The added organic material improves the infiltration and retention of water in the soil. The micro catchments help to mitigate against periods of drought that occurs frequently in arid and semi -arid regions.

In matter of concentrate fertility, Zaipits concentrate fertility near the crop root zone, wind or runoff driven debris, including leaf litter from nearby vegetation is caught in the pit. Fertility



gained from these sediments is mixed with organic or mineral fertilizer making them highly fertile.

In terms of accelerated decomposition, in the semi-arid tropics, termites are abundant; their activities contribute significantly to decomposition of organic matter and nutrient cycling in the soil.

The favorable Zaipits environment accelerates the decomposition making the Zaipits to remain productive for longer period compared to areas without Zaipits.

## 1 1 2 - Concrete bamboo water tanks to control soil erosion and provide water for households and farming in Kamonyi District

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The floods are ruining the crops thus, the production in the lower parts of the District of Kamonyi

The construction and use of the concrete bamboo water tanks in Kamonyi District have been implemented by Rwanda Rural Rehabilitation Initiative (RWARRI) in partnership with Kamonyi District with the funding from Rwanda Green Fond.

Kamonyi District is one of the eight Districts that makes up the Southern Province of Rwanda. Its average population density is 523 inhabitants per square kilometer.

The population density perhaps one of the highest in the country exacerbates the problem of erosion as the land is cultivated all the year round and leaves the soil fragile and prone to erosion. The District faces a serious water runoff causing soil erosion, floods and losses of property and physical infrastructure.

The root cause of erosion in the District is primarily caused by steep bare

slopes which accelerate the removal of the topsoil coupled with lack of water catchment facilities to stop the surface runoff.

The construction and use of the concrete bamboo water tanks in Kamonyi District is a solution to unreliable and unpredictable rainfall pattern resulting into prolonged drought and the soil erosion.

Rainwater harvesting is a measure to climate change in controlling soil erosion while providing water for households and farming. The construction and use of 10 metric cube concrete bamboo roof top water tanks is a response to the kitchen garden and livestock watering as well as the other domestic uses. The project supported the creation and strengthening of water users' associations as the community key stakeholders.

The experience is the use of environmentally friendly construction materials (bamboos and trees) during the construction of concrete bamboo roof top water tanks. The project supported the construction of the 59 bamboos roof top water tanks which were provided by the District to the vulnerable from Ubudehe<sup>2</sup> category 1 and/or 2. All the trained technicians have been grouped into a loose association of technicians with the expertise of constructing such water tanks. The scalability of the water

<sup>2</sup>Social and economic category

tanks is now facilitated by the trained construction technicians who are able to construct on service paid to the well standing community members who can construct a 2, 3, 4, 5, 6 and/or 10 metric cube water tanks depending on everyone's capacity.

Through those interventions, 1425 local technicians of whom 960 representing 67% are women and 465 representing 37% are men were trained as local facilitators in the construction of bamboo roof top water tanks. After the training, all trained technicians were provided the job to construct 59 bamboo roof top water tanks across the District of Kamonyi. All the trained technicians are found in each of the cellules comprising Kamonyi District.

The significant changes brought by the actions in the community include the

limitation the effects to be caused by 590 metric cubes runoff water that would deport the fertile soil for agricultural production. So, the production has increased on the land protected against soil erosion but also the vegetable production and provides water for livestock around the households. Some beneficiaries have changed their life and housing styles due to the time saved and allocated to the households' development.

Beneficiaries are organized and integrated into water user associations, which are formed at the cell level up to the district level. Each Water Users Association (WUA) is formed and organized around a water tank facility set up. Each association has a committee that represents all groups, including women and youth, in association management.



A bamboo plantation to minimize the effects of climate change by creating barriers to soil erosion.

### 1.1.3. Enhancing climate change resilience through rainwater harvesting in Kenya

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Dam with liner and water collected

The experience of harvesting rainwater to enhance climate change resilience of the beneficiaries was undertaken in Machakos County in the Eastern part of Kenya. Specifically, it was done with Old Men and Women Self-help Group, based in Kiima Kimwe Location, in Machakos County with an average rainfall of about 770 mm per year. It consists in capturing and storage of rainwater during abundance for later use for domestic, farming and industrial use. It is drawn from the Biovision Farmer Communication Programme (FCP).

It aims to improve the livelihoods of farmers while at the same time ensuring environmental conservation.

Climate change has been a big challenge to farmers, especially with the shift in rainfall patterns, with rains being unreliable, both in amounts and distribution. Through the Programme, farmers are trained on ecologically sustainable agriculture technologies and practices that enable them build resilience to climate change.

In that sub-region classified as semi-arid, water plays a major role on agricultural production and with climate change; rainfall received in this region has become very unreliable both in terms of amount and distribution. In most cases the rain falls very heavily within a short period of time and gets wasted through flooding and underground drainage. This means that for most of the year, the community does not have adequate water for farming and domestic use. In addition, the heavy rains cause destruction by carrying away the top fertile soil, further affecting productivity.

As with most smallholder farmers in Kenya the economy of farming communities in Machakos relies on rainfall given the centrality of and dependence on farming. As a result of this, most members of the community only had food for a short time, during the rainy season. During the dry spell, food was scarce and expensive, and many families attest the fact that they have to contend with one meal a day. Women had the additional burden of travelling long distances to fetch water for livestock and domestic use. Apart from being tiring and back breaking (literary), a lot of time is spent in the process, valuable time that could be put into other productive activities.

As with most smallholder farmers in Kenya the economy of farming communities in Machakos relies on rainfall given the

centrality of and dependence on farming. As a result of this, most members of the community only had food for a short time, during the rainy season. During the dry spell, food was scarce and expensive, and many families attest to the fact that they have to contend with one meal a day. Women had the additional burden of travelling long distances to fetch water for livestock and domestic use. Apart from being tiring and back breaking (literary), a lot of time is spent in the process, valuable.

The experience produced significant changes, it increased food availability and improved family nutrition from the off-season vegetables produced and consumed. The action also contributed to increased income at household level since the surplus food produced using the harvested water was sold.

The benefits for women are numerous. With water available nearby almost all year round the women are able to produce food most of the year. With



**“ With ideas on water harvesting, we can produce more since our soils are fertile enough to support vegetable and maize farming and this will eradicate poverty and improve on food security ”.**

Says Zipporah

Ms. Zipporah Wambua with an off-season maize crop from using harvested rainwater

The program and the experience sought to solve the problem of inadequate water to sustain crop and livestock production that was evident in the region due to the unpredictable weather patterns brought about by climate change.

Rain Water Harvesting (RWH) is steadily gaining attention as a sustainable alternative for managing water shortages, especially for rural farming communities. It is economically viable, socially compatible and environmentally friendly.

increased food production, they can feed their families better (improved nutrition) and sell the surplus and get money to meet their other needs such as paying school fees.

Before harvesting rainwater, women had to travel far to fetch water for domestic and farm use. After this they were too tired to perform other household chores and farming activities well. With water now available nearby, they have more time and energy to perform other duties well. This ensures happy households.

### 1.1.4. Kitchen gardens to adapt to climate change and mitigate its effects in a context of land scarcity

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A kitchen garden



In Burundi, climate change results in heavy flooding caused by periods of heavy rainfall followed sometimes by prolonged periods of drought. This country of 27,834 km<sup>2</sup> is particularly confronted with a high population density, with an average of about 523 inhabitants per km<sup>2</sup>.

Finally, the numerous socio-political wars, including the one in 1993, have led to a massive displacement of the Burundian population into camps for displaced persons. This has increased the number of cases of food and nutritional insecurity, especially among children and pregnant women.

The experience to promote kitchen gardens is taking place on Nyamugari and Gihehe hills in Giheta commune, Gitega province and on Nyabisaka hill in Ndava commune in Mwaro province.

Kitchen gardens are an alternative to help produce food all year round without being affected by floods or prolonged drought. Therefore, in addition to the areas mentioned above, Inades-Formation Burundi, with the financial support of GIZ, ALBOAN and Oxfam Novib, has extended the promotion of these gardens to the provinces of Bujumbura, Rumonge, Ngozi, Makamba and Cibitoke.

A kitchen garden is constructed by attaching stakes with a cross section between the stakes. These sections are made from jute sacks, sisal rope, or even banana spathe. Kitchen gardens can be one, two, three, four or even five levels. For multi-level gardens, often circular in shape, one or two aisles are provided to allow the farmer access to all levels when fertilizing and maintaining the crops. Each level is filled with a soil mixture and is a planting space. The size of the garden differs from one garden to another and according to the resources of the producer.

The kitchen gardens are installed close to the houses, which makes it easier to water them in case of water stress. One

or more market garden crops can be planted, including one per level. These crops generally allow households to have vegetables all year round to supplement the production deficit of ordinary fields.

These vegetables are often amaranth, cabbage, carrots, beets and red onions; they are rich in vitamins and help fight malnutrition, especially among children.

### **Mrs. Ntakarutimana Jacqueline, a beneficiary of a kitchen garden testifies**



Before the introduction of the kitchen gardens, we used to eat vegetables in our household only once a week. Now that I have learned to grow vegetables in the kitchen garden, my family consumes them every day and I am proud that the health of our children is very good. This

practice of producing vegetables in the kitchen garden has many advantages:

- Less requirement of cultivation space;
- Ease of supply. Even during the night, I can harvest when I come back late from my field;
- No theft because the field is close to the house;
- Good use of manure (no waste of manure);
- Ease in transporting organic manure at the time of fertilization;
- Continuous production throughout the year.

### 1.1.5. Ecological restoration of degraded agricultural land with compost produced with mushroom substrates in Togo

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Mushroom substrates

The experience was conducted in the south-east of Togo in the villages of Sékopé, Kousségbé, Légbanou and Kpotossou-Hédjé in the prefecture of Vogan in the maritime region of the country. The project area is located approximately 105 km from the city of Lomé, the capital of Togo. The prefecture of Vo is a vulnerable area in which land degradation, aggravated by drought, has drastically increased over time. More than 83% of cultivated land is degraded.

This degradation is accentuated by the effects of climate change such as pockets of drought, irregular rainfall and erosion. This seriously affects crop yields and therefore the economic life of the population, especially women farmers.

The experience consists of fertilizing agricultural land with composts made from mushroom substrates. These mushrooms are produced in 21 days with natural elements such as straw cut into small pieces and wet with water, it

is then mixed with quicklime and rice bran. This mixture is finally heated, which provides a substrate for the production of edible mushrooms. After 21 days, the mushrooms can be harvested for about three weeks. After three weeks, the substrates are collected and put in a hole closed with plastic. The compost matures after two weeks in the hole. This compost is used to amend agricultural land. These mushroom substrate composts allow the plant to better withstand pockets of drought. They are mainly used for market gardening and/or seasonal crops such as corn, chili, tomatoes, gboma, ademé (leafy plants), okra, beans, ...

As a result of this experience, 302 women have acquired the necessary knowledge to produce composts from mushroom substrates, 267 know how to produce edible mushrooms. Eight hectares of farmland have been restored and boreholes installed in the project area; the production of market garden crops has increased. Women's groups have developed a dynamic for marketing organic market garden products in the Vo prefecture and surrounding villages.





## 1.1.6. Control of erosion and agro-ecology: a means of increasing climatic resilience in the commune of Keur Moussa in Senegal

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A "half-moon" ground

The experience of promoting practices of restoration of wasteland, biodiversity and agro-ecological production proposes an adoption at the scale of the territories, of the systems of optimal management of rainwater in particular by the diversity of the anti-erosive arrangements.

In 2005, Enda-Pronat and the Woobin Farmers' Federation conducted a diagnostic study in 17 of the 36 villages of the commune of Keur Moussa in Senegal. This commune is located about 50 km from Dakar, in the region of Thiès, a region made up of a massive plateau with a rugged relief and very strongly exposed to the effects of climate change. The commune covers an area of 222 km<sup>2</sup> with a population of 11,000 inhabitants.

Faced with the challenges of loss of biodiversity, reduction of cultivable land and threats to the survival of the

populations of the commune of Keur Moussa, especially women, it was fundamental and urgent to support these populations so that they could adapt to climate change and mitigate the effects on their activities and their lives.

Thus, since 2007, Enda-Pronat has been supporting these populations in the carrying out of various anti-erosion activities such as the construction of stone barriers, filtering bridges, infiltration pits and half-moons. It also places particular emphasis on reforestation actions to fight against deforestation caused by abusive cutting operated by herders to feed their livestock.

Since 2014, 114 ha of land have been reclaimed and 28,650 Acacia Senegal and Melifera trees have been planted in the 7 villages of the commune of Keur Moussa concerned by the experiment. All the achievements have contributed to slow down the runoff, recharge the water table and recover the agricultural land of the commune.

To safeguard and perpetuate these works, a local convention was set up in 2013 in three of the seven project villages. The local mechanisms of this convention aim to maintain the achievements of the efforts made for the sustainable management of natural resources such as the fight against the removal of sand

by some offenders, which slowed down the filling of gullies. This convention also protects the reforested areas around the anti-erosion assets.

The main innovation, however, is the approach used to encourage the voluntary mobilization of local populations, particularly women, in soil defense and restoration (SRD) activities. Enda-Pronat has encouraged and supported the establishment of self-managed village funds to help finance income-generating activities. This has helped to obtain and strengthen the support of the population for activities promoting the restoration of wasteland, biodiversity and agro-ecological

production practices. Thus, 733 people, including 620 women, were able to access 19,484,000 FCFA in credits between 2018 and 2019. The women concerned can more easily ensure daily family expenses, take care of the purchase of supplies for their children's schooling and support each other during various social events in their villages.

The capacity building of producers in these practices has allowed for the intensification of market garden and fruit production in the commune. Organized around self-managed village funds, these women have been able to develop activities in small trade, poultry farming and agro-ecology.



Development of a half-moon ground to promote water infiltration and the conservation of humidity in the soil around the trees

## 1.1.7. Planting the dune to plant hope in the hearts of the people of Lompoul in Senegal

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A dune planted and fixed

The experience of building a green wall takes place in Lompoul in the region of Louga located 30 km from Kebemer, the capital of the department of Kebemer. With its 36 km of coastline, the area of Lompoul concentrates the shifting sand dunes most affected by the strong pressure of sea winds. This situation is partly due to the low rainfall, 200 to 500 mm, and global warming that have affected the region of Louga for over two decades.

The advance of the dunes is causing the silting up of market gardening basins and a decrease in horticultural production, which is leading to a significant migration of people to the cities. Women and children are the most affected by this scourge. It was important to find appropriate, sustainable and multidimensional responses to this destruction of the local ecosystems' balance.

The experience of the «Fédération des Associations de développement communautaires (FADEC Nord)» focuses on the construction of a «green wall» in Lompoul to help the populations of this locality to better protect themselves from the sandy winds that cause the erosion of the dunes and the silting up of the market gardening basins.

Several actors participated in the implementation of this experience, mainly the Water and Forestry Service of the Ministry of Environment and Sustainable Development, FADEC-Nord, the Spanish NGO Solidaridad Internacional, the Savings and Credit Mutual - FadecNjambur and the local populations, mainly the market garden producers of the Lompoul area.

The experience focused on building the capacity of producers on the techniques of natural crop protection (NCP), assisted natural regeneration (ANR), biological control, soil defense and restoration (DRS). The market gardeners also learned how to use the drip irrigation system, composting techniques to improve soil fertility, and marketing techniques for better marketing of horticultural products. FADEC-Nord also provided them with advice on horticulture and the making of fascines. Fascines are protective panels made from *Guiera senegalensis* (Nguer in Ouolof), a shrub that can regenerate after three months.



They were also able to produce tree seedlings in a nursery and plant them.

Several important achievements are visible in the Lompoul area covered by the experience: the market garden basins are protected, the populations are fixed on their land, biodiversity is gradually being rebuilt with the return of certain plant and animal species that had disappeared from the area, such as hares, jackals, monkeys, squirrels, snakes and monitors. Fascine producers can

more easily obtain quality agricultural inputs from the revenue generated by the production of these protective panels. The project has led to an overall improvement in the living environment and health of the people of Lompoul.

This experience, launched in 2009, has stabilized more than a thousand hectares of living dunes through a massive plantation of woody species, mainly *Eucalyptus* sp.



Production of seedlings in nurseries



Nursery work by women



Activity of agro-forestry tree planting to plant and fix the dune

## 1.1.8. Rainwater Harvesting for sustainable agriculture through the Deep Tillage

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Deep Tillage

In semi-arid areas of Dodoma and parts of Singida, soils are usually very compact if not too sandy (In valley bottoms and sandy rivers). This prevents easy infiltration of water as well as a good penetration of roots into the soil. It usually leads into poor crop performance that affects lives of people in the area who often become food insecure. The deep tillage practice helps to break these compact soils for easy infiltration of rainwater as well as easy penetration of roots that has improved crop performance.

In doing deep tillage, the following steps are done.

1. Identify where you want to cultivate and do land clearing;
2. Start deep tilling the plot from down slope to upslope to a depth of one foot or more. You can use any tool from hand hoe, animal drawn implement, tractor drawn implement;
3. Then harrows your plot to break bigger

pieces of soil into small pieces soil matrix;  
4. Construct a surrounding earth bund at the bottom and two sides of the plot leaving the top without any bund to allow runoff into the plot. The plot will be ready to sow seeds and continue with other necessary management operations up to harvest of matured and dry crop.

Inades-Formation Tanzania led the process of that action-research-training of deep tillage rainwater harvesting for increased productivity.

The experience has allowed rainfall to infiltrate into the soils root zone and thus become available for crop water requirements of a given crop and all other



Deep tillage practice helps to break these compact soils for easy infiltration of rainwater

vegetations. Before this experience, as the soils were compact all the rainfall hitting the compact soil surface could not infiltrate into the soils and thus converted into a runoff that flowed

down slopes into valley bottoms, rivers lakes and ultimately to oceans leaving a very dry yet compact soils unsuitable to support crop growth.

The practice has also brought changing of a sandier soil in farmer plots into more loamy soils as organic matter increases from increased vegetative cover that dies and replenishes the sandy soils. Also, as the soil matrix has more moisture there is the reoccurring of water springs that disappeared from drought.

The experience developed community resource persons who are recognized by all stakeholders. For example, in Mpwapwa district the project worked in 4 villages and in each village, there are 2 community resource persons (a male and a female) who are helping farmers on putting into practice what they have learned. The experience directly reached a total of 221 women who are 84.8% of all direct beneficiaries.

Based on feedbacks from farmers, the practice has contributed into the following achievements that include: increased yield of crops per acre. For example, sorghum yield increased from 4 to 15 bags of 100 kg per acre on average,

some have reached 20 bags per acre. The yield of maize increased from 2 to 12 bags per acre on average; some have reached 18 bags per acre. The yield of sunflower increased from 4 to 18 bags per acre; onion from 8 to 25 bags per acre.

Farmers increase their incomes from the sales of excess crop produced. For example, in the 2016/2017 season Rahel Udoba produced 1600 kgs of sorghum seeds which she sold at 2000 Tanzanian shillings where she collected 3,200,000 Tanzania shillings. The same family cultivated one acre of onion and harvested 30 bags of onion and sold each at 80000 hence collected 2,400,000 Tanzanian shillings in 2017/18 season.

These environmental changes have resulted into increased crop performance and hence crop productivity whose outcome is food security which was the goal of the project. The improved food security has also helped farmers to sell excess farm produce and earn income that helped them to diversify into other non-farm income generating activities. All these has led into improved livelihood of people in the community.

### 1.1.9 Ponds to retain rainwater, promote market gardening and livestock breeding in the dry season in the villages of Moulkou and Torrock in Chad

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In 2013, Inades-Formation Chad began an experience to build ponds to retain rainwater for the benefit of farmers and herders in Mayo Lemié and Mayo Dallah, in the provinces of Mayo-Kabbi-Est and Mayo-Kebbi-West. These areas are located approximately 200 and 500 km respectively from N'Djamena, the capital of Chad. The experience was particularly developed in the villages of Moulkou and Torrock. In Moulkou, for example, there is only 500 to 600 mm of water fall per year. Although located in the Sudanian zone, Torrock, too, regularly faces significant rainfall deficits, especially at the end of the rainy season.

As a result, market gardeners and livestock farmers in these two localities had great difficulty carrying out their activities during the months of low rainfall. Small ruminants had to travel between 8 and 10 km to drink from the ponds, and 20 km to reach the Logone River. The first victims of this situation were the women, the majority of whom were responsible for this type of breeding. The scarcity of water caused a sharp decrease in market garden yields during the dry season. During these periods, the use of water from quarries also caused community conflicts.

Faced with these different observations and inspired by the practice of using water from quarries by the communities it supports, Inades-Formation Chad


wanted to offer them more efficient systems for retaining rainwater.

Retention basins two or three meters wide and four or five meters long, with a depth of one and a half to two meters, were built on the slopes of cultivable areas to store runoff water in order to cope with drought and thus ensure the irrigation of market garden crops and the water needs of livestock, especially during the dry season.

The construction of these ponds involved about 302 producers, including 187 women, who carry out market gardening and small ruminant breeding activities; it allowed the transfer of the know-how on the agricultural and multifarm properties of fine clay to more than 600 people involved in the process.

The assets built have also allowed the exploitation of about 17 ha of market gardening over the months of October 2013 to February 2014. To date, the innovation has made 20 ha of land available for small-scale market gardening activities and for raising small ruminants in the Moulkou and Torrock villages.

According to data from the local Rural Development Office, since the construction of the ponds, each year the villages of Moulkou and Torrock produce nearly seven tons of market garden



crops. Nearly 4,300 heads of large and small ruminants come to drink each year in the various assets of the ponds.

The changes are visible at several other levels: the communities supported have understood the challenges of adopting new practices and techniques to retain and store rainwater. They can then use it efficiently for agricultural activities and thus fight against the negative effects of climate change. Today, they also know how they can improve the quality of the soil with the fine clay of the termite mounds to limit water infiltration and have more water for agricultural activities.

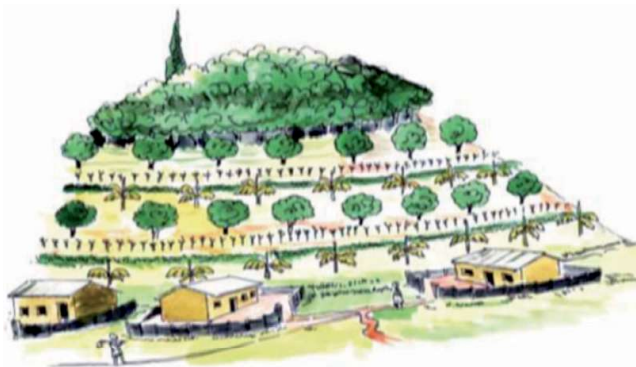
Specifically, this experience has allowed women, and young people, especially girls, to spend less time on household activities thanks to the creation of all these water points near the villages. The girls have more time and are more often on time for school.

The experience is becoming an alternative to limit the transhumance over very long distances of semi-sedentary and sedentary herders in search of water to water their herds. There is less risk of devastating the fields during this transhumance, and conflicts related to this destruction and the sharing of surface water between farmers and herders in the villages have practically ceased.



## 1.1.10. Continuous and competitive integrated family farming systems (CCIFF) for farmer resilience to climate change

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An integrated family farming system

In Burundi, more than 90% of the population lives from family farming and the average farm size is about 0.5 hectare. Despite the small size of the land, it is this family farming that feeds the whole country and provides the rural workforce. It also constitutes, through the family plantations of coffee, tea and other crops, the main source of income and foreign currency for the country.

**“How then to valorize and make more efficient this peasant agriculture in Burundi, a country where production remains in deficit, a country where 58% of children are malnourished?”** This is the main question that ADISCO wanted to answer by promoting integrated family farms (IFFs).

ADISCO supports the development of integrated family farms (IFFs) that preserve natural resources and ensure food security. On fragmented plots of land such as those in Burundi, people can only survive through complex combinations of plants, animals and

trees; for ADISCO, the notion of IFF is therefore not an exogenous invention.

An IFF is a small-scale agricultural enterprise that is different from a traditional farmer's field.

The system uses family labor and is therefore different from the ruinous commercial or industrial operations in the countryside. The integrated family farm (IFF) requires fewer external inputs because it combines an animal, agricultural and tree component. These components, when properly integrated, provide the family with continuity of food, income, and soil fertility and moisture.

The establishment of a quality IFF is a long process that can take up to five years. It requires investments and quality inputs that an isolated household cannot have. This is why the households supported by ADISCO evolve in interconnected dynamics such as grassroots groups, cooperatives and mutual health organizations.

The development of Integrated Family Farms goes through several phases:

1. The primary stage, which is the one in which the conscious household has already implemented all four components (animals, erosion control, agro-forestry, composting pit) on its farm;
2. Stage 2, which means that the IFF

guarantees the household continuity of food, income and fertility of its land, and that it allows it to meet its wood needs;

3. TOP IFF is the stage where everything is in order and proportion. It is the stage where all the components are technically, economically and ecologically integrated in a complementary system that allows for the production and marketing of quality products in a continuous manner and at competitive costs.

The promotion of IFFs involves two phases: the training of endogenous

where the project was developed, there is a visible change in the landscape. From afar, one can see reforested hills, landscaped with contour lines where tall fixative grasses grow, model banana plantations, etc.

- The increase in Burundian livestock. The integrated family farming model also allows for the development of small livestock to ensure soil fertility through the use of manure. Households have been able to acquire goats, rabbits, guinea pigs and cows through the mobilization of resources within the

IFF Stage	2013	2014	2015	2016	2017	218	2019
Households with an IFF in primary stage	6,826	6,959	9,380	10,593	11,668	13,577	13,284
Households in the process of developing an IFF	1,813	2,457	2,893	3,781	4,627	5,296	5,796
Households with a TOP IFF	315	272	239 <sup>3</sup>	324	333	349	375

facilitators and the support of households in the implementation of IFFs.

The table below shows the main changes observed from 2013 to 2019 in households at different stages of development of their integrated family farms.

Other changes include:

- The transformation of the Burundian hillside landscape. In the localities

grassroots groups. This has enabled the endogenous repopulation of Burundian livestock, which had been decimated after decades of socio-political crises.

- The emergence of farmers with a long-term vision. The approach allows farmers to have a better vision of their farms and to envisage a more serene future. The farmers respect/value their productive capital better: land valuation and investment in longer term activities.

<sup>3</sup>The decrease in the number of IFFs at the TOP from 2013 to 2015 is related to the rigor of household self-assessment.

### 1.1.11. Agro-ecological practices to develop agricultural land in the province of North Kivu in DR Congo

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UWAKI Nord-Kivu, in DR Congo, is a federation that brings together 35 unions of women farmers; it has been supporting more than 7,000 women farmers in agro-ecology since 2016. The experience consists of adopting appropriate educational tools, crop itineraries and specifications to help these women install agro-ecological units or rent land for their agricultural activities.

The experience of agricultural land development in North Kivu province has enabled the federation's women and their families to be trained to use agro-ecological techniques. This allows them to effectively combat the combined negative effects of climate change and the socio-political situation in the province. It is also an opportunity for them to learn how to organize themselves to conduct advocacy on agricultural land and environmental issues.

Thus, since the beginning of the action in 2016, UWAKI has supported these 7,000 women farmers in the installation of eight agro-ecological units of 2 ha each. These units created in Beni, Lubero and Masisi all have liquid compost bins, a goat house with a slurry pit that allows for the production of this liquid fertilizer with the goats' urine. Each unit also has a pit to produce solid compost and a tree nursery for fertilizer. The units are


subdivided into sub-units for agricultural production, livestock, fodder production and agro-ecological infrastructure.

Farmers actively involved in the work of these eight units are beginning to use the same practices in their home fields. During the July-December 2019 cropping season, more than 1,600 families installed compost bins in their fields to produce solid fertilizer. They also planted fertilizer trees in these fields. About ten women's groups raised rabbits and the urine from these animals was used to make urea to fertilize their fields. With the expansion of the project, the groups supported by UWAKI have become suppliers of rabbits and vegetables to consumers. This is the case, for example, of the UWAKI unions of Sake and Matanda.

More than 6,400 farmers have been involved in this project, including 3,200 women farmers and 800 youth. The agro-ecological units have set up sales points where local people can get vegetables, rabbits and potatoes.

At the same time, in order to establish a stable governance base, 80 land chiefs were trained on land governance techniques and agro-ecological development of agro-pastoral lands.

This has given a boost to the actors involved in the experience. Thus, 39



concessionaires and pasture owners have learned to combine agriculture and livestock. They now know how to make and use organic fertilizers such as solid and liquid compost and produce fertilizer trees. At the beginning of the agricultural season, they plant these trees and anti-erosion plants at contour levels in the fields. They use solid compost in pots to enrich the soil before planting;

when the seedlings emerge, they start watering them with liquid compost until the second weeding. The leaves that fall

from the trees are used for mulching.

It became clear that the creation of agro-ecological landscapes is a medium- to long-term process. The experience has also shown that the anchoring of agro-ecology promotion mechanisms is closely linked to the establishment of local land governance mechanisms. The involvement of customary chiefs and landowners in dialogue frameworks has made it possible to secure land for farmers who manage the land but do not own it.

## 1.1.12. In Northern Togo, in the Savannah region, women adopt practices to produce firewood on marginal lands

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The experience of valorization of marginal lands for the production of fuelwood or wood-energy is drawn from the «Agro-ecological intensification of agricultural production in the savannahs and sustainable management of natural resources» project. From January 2014 to December 2016, this project was implemented by Inades-Formation Togo in collaboration with «Agronomes et Vétérinaires Sans Frontières (AVSF)». It received financial support from the European Union (EU) in Togo, the «Agence Française de Développement (AFD)», CFSI - Fondation de France, the RAJA, New Field foundations and ASTM<sup>4</sup> of Luxembourg.

The experiment was developed in the prefectures of Tône and Tandjouaré in the savannah region of northern Togo. This region located in the extreme north of Togo is essentially agricultural. It is a dry savannah area that experiences a single rainy season. Climatic hazards and human activities have significantly reduced soil fertility, which affects agricultural yields and the incomes of farming families and leads to food insecurity.

In this region as in the rest of the country, wood accounts for 71% of total energy consumption. The growing need for wood energy due to demographic pressure is putting significant pressure

on natural woodland areas and increasing the difficulty of collection, especially for women who are the main users. These have a significant impact on woody resources, one of whose main roles is to sequester carbon, which helps build resilience to climate change.

The experience consisted of support and guidance for the establishment of woodlots for the production of firewood and to fight against soil degradation. In addition to awareness raising and capacity building activities, Inades-Formation Togo and its partners, notably AVSF and UROPC-S (Regional Union of Savannah Cereal Producers), were able to provide wheelbarrows, crowbars, rakes and 17,147 agro-forestry seedlings to 203 beneficiaries of the action, including 166 women. They were able to reforest 42 ha of marginal land with species such as Senna, Neem, Albizia, Teak, Anacardium, Leucaena, Moringa and Eucalyptus.

The strategy and the approach of implementation of the action have favored the empowerment of the main actors and beneficiaries, their full participation in all phases from design, implementation, monitoring to evaluation of results. The capacities of grassroots market gardening groups and cantonal unions were also strengthened in terms of agro-ecological techniques. The capacity building of the market gardening

<sup>4</sup> Action Solidarity Third world

groups and the UROPC-S (Regional Union of Savannah Cereal Producers) allowed for a good appropriation of these techniques for a sustainability of the results of the experiment.

As a result, ten sites located on mountain slopes, river banks, in totally degraded uncultivated areas have been rehabilitated, which corresponds to approximately 56 ha of previously unusable land. Contracts were signed between the beneficiaries and the landowners for the use of these sites for 99 years. The members of the ten management committees, each composed of seven people, including 5 to 6 women, were trained on the approach to setting up woodlots, the purpose of these areas, the management rules, including those for sharing benefits, and each site was given a simple management plan. A total of 455 people, including 365 women, participated in the meetings organized to develop these tools. The training sessions also focused on empowering women with specific actions such as functional literacy and training on their economic and social rights. It should be noted that men also benefited from these training sessions.

Nineteen people, including 13 women, have established individual woodlots in the cantons of Bopak and Nano, covering a total area of 23 ha, with forest, agro-forestry and fruit species such as Eucalyptus, neem, Senna siamea, Acacia albida, Khaya senegalensis, Moringa oleifera, Albizia lebbeck, shea tree, teak, cashew tree and Leucaena tree. In total, 65 ha of woodlots have been established for 222 beneficiaries, 80.60% of whom are women and 24.36% of whom are young people, thus resolving in the medium and long term the problem of access to firewood for cooking by the people of this region.

The vegetation cover of the savannah region has been reinforced. In addition to raising awareness, the action has considerably strengthened the resilience of women to climate change. After two to three years of exploitation of the plots received, they produce enough wood to satisfy their domestic needs. The women's groups were also provided with donkey carts, which made it easier to transport tree seedlings to the planting sites and wood to the places of use, as well as compost, straw and pebbles for the construction of stone barriers on degraded land.

### 1.1.13. Introduction of “Acacia Albida” plant species in the agricultural production system to face land degradation in the Far North of Cameroon

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Transport of seedlings to be transplanted in the lands to be rehabilitated

The populations of the Mayo Kani and Mayo Danay departments in the Far North region of Cameroon derive their income mainly from agro-pastoral activities. Food crops, particularly cereal crops (millet, sorghum and corn) and legumes (groundnuts and cowpeas) constitute the basis of their diet.

Unfortunately, the agricultural land has become almost infertile and less productive due to the strong pressure exerted on it, climatic instability and the progressive drying of the environment. Irregular, short-lived and often torrential rains cause the destruction of crops, silting of cultivated areas and erosion, which exposes the population to low agricultural production and enormous difficulties in meeting their food needs.

This Sahelian region is also threatened by the advance of the desert favored by, among other things, abusive wood

cutting, without any real regeneration actions.

Trees with a fertilizing effect have therefore been introduced into the agricultural system to stabilize, protect and enrich the agricultural land and also to fight against desertification. This experience aims to help the populations of the Mayo Kani and Mayo Danay departments, through the practice of agro-forestry and the implementation of biodiversity conservation strategies, to fight against food insecurity and increase their resilience to the effects of climate change.

To achieve these objectives, farmers in these departments were first informed and sensitized on the effects of climate change. They then organized themselves to plant agro-forestry trees. These farmers learned the techniques of planting, monitoring and maintenance of multipurpose plants (multi-use agro-forestry). These trees, such as *Acacia Albida*, can restore degraded farmland and improve its productivity in a sustainable way. The organizations received financial support for the implementation of training through the acquisition of *Acacia Albida* seedlings and other agricultural inputs.

Inades-Formation Cameroon worked with other actors such as the deconcentrated structures of the Ministry of Environment,

Nature Protection and Sustainable Development (MINEPDED) and the Ministry of Forests and Fauna (MINFOF), communal and traditional authorities, as well as the National Agency for Support to Forestry Development (ANAFOR).

70,000 acacia seedlings were planted, including approximately 50,000 *Acacia Nilotica*, *Acacia Poliacanta* and *Acacia Senegalis* seedlings to be used as living hedges or to delimit individual and collective plots. 20,000 *Acacia Albida* seedlings were planted on farmland to help fertilize, stabilize and protect it. Approximately 400 ha of farmland were regenerated in this.

Overall, nearly 3,500 people have seen their capacities strengthened in the



various fields covered by the actions. The local workforce has been valorized, especially young people and women, for the operations of maintenance and handling of seedlings within the reception sites in the communities and other villages.

The women, who are very interested in the various activities, observe and feel the positive effects as the trees grow: increased yields and organic matter content of the soil, maintenance of soil moisture. Acacia trees also produce firewood, shade and shelter, which are very useful in this Sahelian region.

From the information collected from community members, it appears that soils are less degraded because erosion no longer takes away the good soil, the effects of erosion are indeed greatly reduced thanks to the trees that allow to fight against the storms and reduce the effects of erosion.

In addition, some young people have developed micro-enterprises around the realization of nurseries and the production of agro-forestry plants. They earn income from these activities, which helps them take care of their families. In the surrounding villages of the localities concerned by the experiment, some farmers now plant agro-forestry trees in their agricultural plots.