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Impact of the Agricultural and Forestry Development Project (PRODAF) on the Sustainable Development of the Luozi Territory

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Abstract

The objective of this study is to contribute to the identification and analysis of the impacts of PRODAF activities on the environment of the Luozi Territory in a context of sustainable development. The project established extension centers in the ten sectors of the said Territory, produced and planted approximately 5,000,000 trees of various species over an area of 882 hectares. The dominant species is Acacia auriculiformis. Youth through schools, customary rights holders, local and political-administrative authorities have been made aware. The project has greatly contributed to food security, stopping the desertification of the Territory and reducing poverty. Which proves the sustainability of the project.

KEYWORDS: Project impact, PRODAF, sustainable development and Luozi Territory.

INTRODUCTION

Sustainable development can be interpreted as "development that takes place over time" [1], that is to say an evolution during which the maximization of the well-being of current generations does not reduce the well-being of future generations.

From the perspective of sustainable development, non-governmental development organizations (NGDOs) in the Democratic Republic of Congo (DRC) adopt a collaborative approach that integrates various government and private sectors. They emphasize the importance of empowering local communities, improving social capital and reducing poverty as fundamental elements of sustainable development [2]. This approach is shaped by the need for NGOs to align their activities with broader Sustainable Development Goals (SDGs) while addressing local challenges.

Along with the government and the private sector, non-governmental organizations (NGOs) constitute the third pillar of sustainable development. It can only be strengthened if the government, the private sector and NGOs work in synergy. Nowadays, in many countries, NGOs are effective and credible partners. Many social support functions, such as helping victims of natural disasters and wars, supporting human rights, protecting the environment and trying to implement the Sustainable Development Goals, cannot be achieved without the cooperation of sustainable development actors. Thus, any society that aims to achieve sustainable development cannot ignore the activities of non-governmental organizations [3].



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The role of NGOs in promoting sustainable development through tree planting is a remarkable testimony to human commitment and collective action. As these organizations continue to sow the seeds of change, we can anticipate a future where thriving forests, resilient ecosystems, and self-sustaining communities become cornerstones of sustainable development [4].

The Agricultural and Forestry Development Project, PRODAF in acronym, had operated in the Luozi Territory from 1981 to 2006, led by the Evangelical Community of Congo, CEC member of the Church of Christ in Congo, ECC and financed by the Swedish International Development Agency, ASDI. The main activity of this project was reforestation by planting trees of various uses in the ten administrative sectors of the Luozi Territory.

Socio-economic development in the Democratic Republic of Congo in general and in the Luozi Territory in particular aims at the overall improvement of the living conditions of the populations, which contribute to their development. Soil restoration by planting trees occupies a fundamental place in the lives of individuals because it ensures the satisfaction of psychological and security needs [5].

The drought which raged in central Kongo between 1977 and 1978 was the basis for the creation of PRODAF with a view to combating famine, malnutrition, disease, mortality and dependence; signs of poverty. However, it appeared imminent to establish links with policies to combat poverty and good governance by coaching target populations in self-care and awareness of good management of their environment through the planting of trees.

In carrying out this study, we ask ourselves two questions for which we will seek to answer in the body of this study, these are:

- 1. What is the impact of the concept of sustainable development on the management of the NGDO PRODAF?
- 2. What are PRODAF's social actions in favor of the population in its area of action?

In response to our questioning, we propose two provisional assertions:

- 1. The concept of sustainable development has a significant impact on the management of PRODAF by promoting collaboration, the empowerment of communities in the face of their social problems, by mobilizing resources and promoting the production of knowledge;
- 2. The project enhanced social capital building-by-building trust through empowering individuals, promoting participation, facilitating collaboration, addressing social issues and creating knowledge. The creation of green spaces in all sectors thus influencing soil restoration, which involves increasing agricultural production, food security and reducing poverty. This can promote the resilience and cohesion of communities, capable of effectively pursuing sustainable development goals.

The general objective of this study is to contribute to the identification and study of the impacts that PRODAF activities have likely generated on the environment of the Luozi Territory in the context of sustainable development.

Specifically, said study aims to:

- Determine objectively verifiable indicators that show the success of this project in resolving the problem of desertification in the Luozi Territory;
- Analyze the potential environmental and socio-economic impacts based on the actions initiated by the project that could promote sustainable development.



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PRESENTATION OF THE STUDY ENVIRONMENT 1. LOCATION

Luozi is one of 145 Administrative Territories of the Democratic Republic of Congo spread over 26 provinces. Located in the province of Kongo-Central, the Territory of Luozi shares a long border of 318 km with the Republic of Congo-Brazzaville in the North-West, it is limited to the South-West by the Territory of Seke-Banza, in the Bas-Fleuve and, is bounded to the South-East by the Congo River which separates it from the Territory of Songololo, 110 km from the City of Kimpese, naturally limited with the Congo River, 100 km of which are navigable between Isangila in the South and Mpioka in the North [6]. The Luozi Territory has an area of 7,772 km², made up of ten sectors including Balari, De la Kenge, Kimbanza, Kimumba, Kinkenge, Kivunda, Mbanza Mona, Mbanza-Mwembe, Mbanza-Ngoyo and Mongo-Luala with a population of 526,418 inhabitants [7]

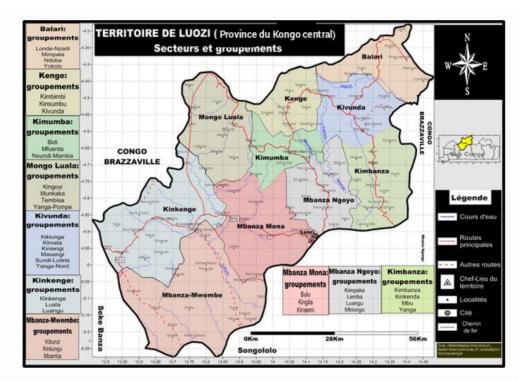


Figure I: Luozi Territory

Flora: The vegetation is mainly made up of a grassy savannah dotted with shrubs and gallery forests with low-density trees in the North and large forests in the South (Kinkenge, Mongo Luala and Mbanza Mwembe sectors) mainly due to the continued action of not only deforestation but also uncontrolled bush fires.

At the weed and pioneer stages, there is the predominance of species with a very wide geographical distribution and belonging to the families of Asteraceae, Amarantaceae, Cyperaceae, convolvulaceae and Malvaceae, namely as shrubs and as grassy vegetation: it is essentially dominated by poaceae such as Hyparrhenia diplandray, Cynodon dactylon, Panicum... The other species are dicotyledons such as Chrolaena ordoratum, Euphorbia, etc. [7]

Fauna: The fauna of the Luozi Territory is rich and varied, from springtails and soil nematodes to arboreal primates, edible and inedible insects, rodents and birds.



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The climate: The territory of Luozi has a humid tropical climate, with the alternation of two seasons: The rainy season (the longest) usually begins on September 15 and ends on May 15 of the following year, with the intercalation of a small dry season between the months of January and February;

The dry season (the shortest) occurs on May 15 and ends around September 15 of the same year.

The two main types of seasons are divided into five seasons. This is the great dry season, it is the mildest period of the year which goes from May 15 to August 25, the period of great heat (Mbangala) which goes from the end of August to the beginning of October; the first rains, which last from September to December, the short dry season which begins in January and ends in February; the short rainy season lasts from March to May.

The rainy season is characterized by humid heat from a tropical sun, while the dry season presents a coolness of up to 16°C in the Kinkenge mountains.

Generally, precipitation is short-lived; they are concentrated on around ten days per month and total for the rainy season, an average monthly height of around 130mm, with a maximum that can exceed 200mm in March and April [7].

The relief: The Territory of Luozi extends over a vast plateau made up of grassy savannahs and small hills. At geographic coordinates between 4°57' to the South and 14°7' to the East, its altitude varies between 270 to 850 m in the Central basin.

Latitude: The Luozi Territory is located between 4 and 6° South latitude. That is to say: the northernmost point is at 4° South latitude and the southernmost point is at 6° South latitude.

Longitude: The Luozi Territory is located between 13° and 14° East longitude. That is to say: the westernmost point is located at 14° east longitude.

Altitude: It is divided into 3 Zones and varies between 300 to 800 m altitude, namely:

- 1. The high altitude is located in the North-West in the MONGO-LUALA sectors;
- 2. The MANIANGA plateau of 500 to 600 m, which covers the sectors of KIMUMBA, MBANZA-NGOYO, DE LA KENGE, BALARI and KIMBANZA;
- 3. The central decline varies between 300 to 500 m from the City of Luozi to CONGO BRAZZAVILLE, crossing the MBANZA-MONA sector before reaching the MIMBOMBO and LUALA valleys [7].

2. PORTRAIT OF THE AGRICULTURAL AND FORESTRY DEVELOPMENT PROJECT (PRODAF)

2.1 BRIEF HISTORY OF CREATION

The drought, which raged in the central Kongo province in general, and the Luozi Territory in particular between 1977 and 1978 was the basis for the creation of PRODAF with a view to combating famine, malnutrition, disease, mortality and dependence. Led by the Office of Project Coordination and Support for Development Actions (BCPAD) within the 23rd Evangelical Community of Congo (CEC), the geographical radius of PRODAF took into account the ten (10) sectors of the Territory of Luozi and one of six (6) sectors of the Territory of Songololo.

While the farmers had prepared the fields which should be sown, there was no rain despite the usual period of the rainy season. Not a drop of water had fallen as the season passed slowly and surely. In the meantime, the first growing season (season A) was no longer possible. The seed intended for eventual sowing should be consumed while the previous crops withered since there was no life without water. Rivers have dried up and other ecosystems have dried up completely.

Relief came from several countries through the Churches to be distributed to the populations (medicine



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and food). The group of Swedish experts, ecologists and agronomists went to the field, in the Luozi Territory, for investigations and studies in order to find a lasting solution to the drought which raged in this part of the country and its consequences instead of continuing to distribute food and medicine to the populations.

At the end of this study, the inventory of the region demonstrated that the environment of the Luozi Territory had lost its natural forests and its rare forest galleries.

The mountains and hills were becoming more and more bare. The soil had gradually eroded. There has been a reduction not only in cultivable areas but also in nutrients and soil fertility.

To do this, the two sister Churches: the Svenska MissionForbundet (SMF) of Sweden and the Evangelical Community of Congo (CEC) in the Democratic Republic of Congo took the initiative of setting up the Agricultural and Forestry Development Project in 1981.

Let us remember that the trigger for the project was the drought which raged between 1977 and 1978. However, the problems addressed include famine, malnutrition, mortality and morbidity due to food insecurity and dependence.

2.2 PROJECT OBJECTIVES

The main objective of PRODAF's action was to obtain the commitment of its target in safeguarding the environment of the Luozi Territory, to help this population improve soil fertility by planting trees, mainly leguminous species (creation of artificial forests) with a view to stopping threats to ecosystems, to increase self-subsistence production and guarantee their well-being.

The specific objectives consisted of:

- Establish nurseries in all sectors with a view to producing seedlings of various uses;
- Initiate local communities in environmental management;
- Protect areas of land for afforestation;
- Stimulate the rural population to active participation in rural development;
- Promote optimal agricultural production with a view to improving the well-being to which grassroots indigenous communities aspire, who, moreover, live mainly from agriculture.

To achieve this, PRODAF had set up a series of activities to enable target groups to objectively understand the action to be carried out together:

- 1. Raising the awareness of local communities about the consequences of ecosystem degradation;
- 2. Raising community awareness of the dangers of bushfires, which constitute a high-level threat and the destruction of ecosystems;
- 3. The creation of a partnership between local communities and PRODAF;
- 4. Promoting the achievement of the objectives assigned to PRODAF, which contribute to the well-being to which local communities aspire.

With the evolution of the objectives throughout the course of the activity, apart from the planting of fast-growing trees (legumes) to restore soil fertility, PRODAF also carried out the planting of other species of fruit and food trees, supported by other inherent activities.

2.3 TARGET GROUPS

The action concerned the entire population of Luozi Territory and the Wombo sector, in Songololo Territory where drought was observed. During production, the targeted groups were subdivided into three categories:

• At the center, the project leaders and the ecclesiastical authorities of the 23rd Evangelical Community of Congo with the role of giving the message of awareness/awareness to the indigenous communities,



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potential beneficiaries of the project's action;

- Downstream, land rights holders, landowners, members of associations, peasant households, concessionaires-leaders of initiatives, educational establishments, ecclesiastical parishes including young and old, men and women, rich and poor. Their role was to listen and react (consent or not) to the message conveyed by the project leaders;
- Upstream, officials, authorities and political-administrative representatives at all levels (agronomists, veterinarians, environmental and rural development agents, etc.), local NGDOs and financial partners whose role was to facilitate contact and serve as a bridge between the project leaders and the beneficiaries.

2.5 APPROACHES/STRATEGIES

PRODAF has experienced three major respective phases marked by evolving approaches and strategies, which have enabled it to face its challenges. Below are the characteristics that accompanied these phases.

- The first phase, called PRODAF I, 1981-1989, the strategies of which focused on:
- o Production of seedlings only in central nurseries;
- o The creation of central Nkunku demonstration and experimentation centers;
- Planting and experimenting with exotic and local forestry crops (Acacia spp, Punis spp, Chlorofora exelsa, Terminalia superba, Pantadesma butyracea, etc.);
- Training of local facilitators;
- Awareness/conscientization from which the mobilization of populations for collective work in each village identified and selected for action.
- While the approaches were based on:
- The concentration of action in a pilot zone, in Kibunzi, a region in the Mbanza-Mwembe sector among the ten sectors of the Luozi Territory;
- The creation of green spaces (reforested);
- Project management provided by Swedish expatriates.
- PRODAF II, from 1990-2002. The strategies that have evolved have focused on dialogue between partners, resulting in:
- The active participation of indigenous people in the action with a constructive critical spirit;
- The extension of the action by increasing the number of stations, in addition to Kibunzi, Sundi-Lutete, Luozi, Kinkenge and Kingoyi were added;
- The creation of partnership between individual volunteers and PRODAF:
- Direct participation of beneficiary-volunteers in the action;
- The use of local expertise at the head of the project;
- The gradual reduction of demonstration actions at central level;
- Reduction of staff numbers at the project management headquarters;
- The diversification of speculations to plant.
- While the approaches were focused on:
- The creation of nurseries and Nkunku by clan and/or by individual;
- Support, monitoring and learning of beneficiaries by clan, household or individual, etc.
- Rational exploitation trials of protected and reforested areas (Nkunku);
- Project management by the community development department and project coordination.



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- PRODAF III (2003 2006) is the last period of project activities. This stage has undergone systematic modifications from the point of view of strategies and modes of intervention. The strategies consisted of:
- The closure of all the old stations of the project action;
- The opening of new stations (following the extension of the action);
- Support, learning and empowerment of beneficiaries.
- While the approaches were punctuated by:
- The diversification of modes of intervention, namely the school, parish, family, clan, individual approach, etc. and, freedom of choice by beneficiaries;
- The signing of partnership contracts between PRODAF and beneficiaries of the action;
- Diversification of grassroots collaboration partners;
- The rational exploitation of protected and reforested "Nkunku" areas.

2.6 PARTNERSHIP AND FUNDING

The 23rd Evangelical Community of Congo (CEC) is the institutional partner of PRODAF. While the main financial partner is the Swedish International Development Agency (SIDA), through the Svenska Missionsforbundet (SMF), which subsequently became the Svenska Missionskyrkan (SMK) and today the United Church of Sweden (EUS).

The overall amount of funding for the implementation of the project (PRODAF) during its three phases from 1981 to 2006 was of the order of 10,345,720 Sek (Swedish crowns), or approximately the equivalent of 1,034,572 US dollars.

However, the local contribution was in kind and very important unfortunately not assessed; it consisted of making areas of land available for reforestation, for the production of seedlings and labor in the process of planting trees of various uses and the protection of reforested areas.

It should be noted that PRODAF has also experienced the partnership of other international and national institutions such as the United States Agency for International Development/South-East Consortium for International Development (USAID/SECID), the Central Coordination Office (BCECO), the World Food Program (WFP), the Food and Agriculture Organization of the United Nations (FAO), the Agricultural Extension Center (CVA).

METHODOLOGY

The methodology of this study took place in two successive phases: collection of primary data and collection of secondary data.

Collection of primary data (in the field):

- Direct observations
- Investigation
- Spatial remote sensing of data

Collection of secondary data

Documentary research

The documentation relating to the NGO was provided to us by the Office of Project Coordination and Support for Development Actions (BCPAD) within the 23rd Evangelical Community of Congo (CEC). A certain number of project documents were consulted, the list of which can be found in the bibliography [8].



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RESULTS AND DISCUSSION

1. Application or implementation of sustainable development by PRODAF

Creation of stations

The stations are branches or extension centers where three agents were assigned, including the Representative who was an agronomist, a nurseryman and an extension worker. In the Territory, the NGO/PRODAF had ten stations, including one in each administrative sector. The main towns of the stations were located within the parishes of the Evangelical Community of Congo, manager of the NGO. They are Kibunzi (1981), Sundi Lutete (1989), Luozi (1991), Kingoyi (1993), Kinkenge (1995), Sundi Mamba (1995), Bukaba (1999), Kinzimbu (1999), Kimbamba (1999) and Nkundi (1999).

Raising awareness

The education of the masses in all its forms practiced by PRODAF technicians was only intended to obtain the popular commitment of indigenous people to the processes of reforestation and environmental protection. Notwithstanding the majority of the population, complementary issues have made it possible to involve more populations in almost all of the villages to participate in improving the state of the environment across the Luozi Territory. Students across schools were also made aware, songs were composed to better understand the notions of nature conservation.

Vertically, a sample of 15 reforesters was targeted per station. This sample benefited from technical and material support to the project quotient. And horizontally, any farmer whose land needs reforestation took the seedlings produced at the project's central nursery free of charge.

The organization of five major awareness campaigns on environmental protection in the capital of the Territory, inviting key players, notably administrative officials, religious figures, notables, heads of sectors and groups, dukes of villages, heads of schools and academic establishments, etc. for making decisions in favor of the environment.

Holding of twenty seminars in the different stations and organizations of protest marches against abusive practices such as uncontrolled bush fires, deforestation without forest cover, the use of pesticides, etc.

Organization of 1200 workshops where all the members of a station meet at the home of one of their colleagues for a special technique and practice on the visited site (for example the development of a nursery, bagging, transplanting, watering, digging, transplanting, staking, etc.

Grouping is a means of strategic support for beneficiaries. It is also an excellent means of group self-learning for economical and effective support. The members of a station were subdivided into groups for rotating work each week. The influence of always being in a group gave rise to the creation of three Non-Profit Associations which exist to this day and have legal documents from the State.



Photo I: organization of an exchange meeting between project leaders and indigenous people (reforesters, rights holders) under an Acacia auriculiformis plantation, in the Mukimbungu station.



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Photo II: Bukaba Institute

Moments of awareness-raising were organized with a view to also obtaining the commitment of young people to the action of the project; a way of introducing environmental concepts into their training. All schools (primary and secondary) were made aware.



Figure III: Setting up a compost bin

During a workshop, the project technician demonstrates the activity in a station. Each member supported by the project had a compost bin next to their nursery.

2. Strengthening social capital

Reforestation, an activity limited by the planting of fruit trees, has remained traditional in many corners of the country, such as in the Luozi Territory despite the potential (available land, savannahs, abundant labor, etc.). This is why, among existing plants in forests, their regeneration is natural. And, to this day, it constitutes a limiting factor in the development of forestry capital not only in the area under project but throughout the national territory of DR Congo.

Thus, PRODAF produced and planted approximately 5,000,000 trees of various species over an area of 882 hectares. The dominant species is Acacia auriculiformis. The southern part of the Territory (the sectors of Mbanza Mwembe, Kinkenge, Mongo Luala and Kimumba) was more dominated by the planting of fruit trees in agroforestry (orange trees, avocado trees, safe trees in association with food crops such as peanuts, cassava, cowpeas, beans, corn, yams, etc. In the North, on the other hand, 90% are pure forests of forest species.

Also, PRODAF had introduced market gardening on a large scale into the Territory by making various species of market garden seeds available to farmers.

In partnership with other partners (USAID/SECID, BCECO, FAO and PRONAM) PRODAF had multiplied and distributed improved food seeds such as peanuts, soybeans, corn, cowpeas, rice and



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cassava.

Today, a high production of fruits such as oranges, avocados and safes is noted in the southern part. The reforested areas are exploited (deforested) by applying the approach: forest – culture – forest. The wood is charred and/or sold as firewood.

To do this, PRODAF has largely contributed:

- Socially, to food security by restoring degraded lands, providing means of subsistence to local communities;
- Ecologically, to the support of biodiversity and the regulation of global ecological systems, such as the climate;
- Economically, to income in resources from agricultural production and forest products (wood, embers, honey, etc.).

Opposite, the photos which show the achievements of the project:



Photo IV: Acacia + Beekeeping in Luozi



Photo V: Palm grove in Nkundi



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Photo VI: Acacia magium stand in Kibunzi Photo



VII: Steers of wood in the Luyongo forest in Luozi



Photo VIII: Carbonization in Luozi (Luyongo forest)



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Photo IX: charcoal production



Photo X: Forest - cassava - forest Photo



XI: Honey production in Kimbanza

3. Ownership of project activities by the beneficiary population

The problem of the environment, an area in which PRODAF has invested, is linked to the mentality of the population, which is why the greatest work carried out consisted of revolutionizing the mentalities of the indigenous people, beneficiaries of the project. Mentality affects the mind, the intelligence, even the knowhow and the sensitivity of the being to be favorable or not to a situation. Convinced of this reality, the awareness and awareness campaigns of adults in ecclesiastical parishes and of young people in their schools; demonstration fields, theatrical plays, newspapers, radio broadcasts and television broadcasts were not enough to persuade or better involve the population of Luozi Territory. Notwithstanding the



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literature of several indigenous writers, namely Professors José Dianzungu dia Biniakunu and Jackson Kimpianga Mahania, Pastor Fidèle Muanda Mikiama and the late Zamenga Batukezanga among many others have also allowed a part of the population to internalize the need for the safeguarding of creation by the largely illiterate population.

Above all these channels of communication, PRODAF, through its institutional partner, the 23rd Evangelical Community of Congo (CEC), decided by decision of its Synod, to organize each year the "Tree and Development Week" to face the scourge of desertification which threatens the region.

During this week, teachings in all parishes and schools are focused on nature conservation. Towards the end each devotee and student is obliged to plant a seedling in a public place. To do this, almost all of the villages, parishes, schools and towns in the Luozi Territory are surrounded by trees, mainly Acacia Spp. This belt acts as a wind shelter which prevents the wind from blowing away the roofs of the houses. In the Territory, the Acacia is called "Nti wa PRODAF", the PRODAF tree.

The reforesters, being initiated by PRODAF, continue to produce seedlings of various uses, which they make available to applicants at a reasonable price. Palm grove owners are now major suppliers of dwarf palm seeds.



Photo XII: a young forest planted in 2019 Photo



XIII: Onion production in Mbanza Mwembe



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Photo XIV: dwarf palm seeds



Photo XV: Mini nursery in Mbanza Ngoyo

CONCLUSION

The trees planted by PRODAF through the supervised communities are considered the lungs of the Earth in general and of the region in particular, they play an essential role in mitigating climate change by absorbing carbon dioxide and releasing oxygen, thus acting as natural carbon sinks. Additionally, these arboreal wonders promote biodiversity by providing habitats for a myriad of flora and fauna, thereby strengthening the resilience of our fragile ecosystems. In the context of sustainable development, the benefits of tree planting extend beyond environmental conservation to encompass social and economic dimensions. Communities engaged in PRODAF have planted trees of various uses often benefit from improved livelihoods, food security and increased resilience to natural disasters.

Consequently, PRODAF was greatly involved in the sustainable development objectives, the results speak for themselves.

Ownership of PRODAF's actions is real on the ground 19 years after the end of the project. He participated in food security, stopping the desert and reducing poverty. Which proves the sustainability of the project. We would like to thank the Coordinator of the Office of Coordination and Support for Development Actions, BCPAD, Engineer TUTONDELE MAHEMA Sylvain who made available to us all the useful documentation supporting our study.

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