Capitalization Guide on Good Agroecological Practices

May 2025

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***The agroecology* reduces carbon emissions, protects soils and biodiversity, cares for women, men, ensures their food and provides them with the livelihoods to protect, educate and care for their children, the future generations.**

Summary

Part I. The panorama of agroecology

General introduction

Context and challenges

Agriculture in West Africa is facing major challenges that compromise its sustainability and its ability to feed fast-growing populations. Food and nutritional insecurity remains a cause for concern, exacerbated by galloping demographics and often difficult production conditions. The persistent poverty of agricultural producers reduces their capacity to invest and innovate. In addition, environmental degradation, over-exploitation of natural resources and the impact of climate change are affecting soil fertility, water availability and biodiversity. Faced with these challenges, agroecology offers a sustainable alternative that ensures diversity and food security while reducing the harmful effects of agriculture on the environment.

The agroecological approach contributes to modernizing family farms, creating decent jobs and improving producers' incomes. It encourages an increase and diversification of agricultural production, while integrating systems that respect the environment and consumer health. It also enables better adaptation to climate change by promoting biodiversity, carbon sequestration and maintaining or restoring soil fertility.

ECOWAS approach

As part of the implementation of its regional agricultural policy, ECOWAP, ECOWAS has developed a strategy to promote agroecological transition. The Agroecology Program in West Africa (PAE), set up between 2018 and 2025 with the support of the **Agence française de développement (AFD)** and the **European Union**, and implemented by its **Agriculture and Food Agency (RAAF/ARAA)**, aims to boost food and nutritional security in the region. One of the components of this major programme supports local players through **the development and implementation of innovative agroecological pilot projects**.

Content of the document

This document compiles good agroecological practices, whether technical, organizational or financial, from field projects in the 15 ECOWAS Member States, and highlights cross-cutting lessons that can inspire new initiatives. **It is aimed at agricultural development practitioners and stakeholders**, offering a reference framework for promoting sustainable agricultural intensification and agroecological transition.

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The concepts of agroecology and agroecological transition

Agroecology: different visions but common principles

Agroecology brings together a **various approaches** that differ depending on actors and contexts. Rather than a single model, it represents an adaptive dynamic based on **common principles**. According to the FAO (2018), ten fundamental elements characterise it, including optimising natural processes, diversifying systems, recycling nutrients, reducing dependence on chemical inputs and promoting interactions between crops and livestock.

It differs from conventional agriculture in that it takes a **systemic approach** integrating a wider ecological, social, economic and landscape dimension into the management of production systems. By encouraging natural processes rather than the intensive use of chemical inputs, it improves soil fertility, crop resilience and agricultural productivity in a sustainable way. Contrary to popular belief, **it is not an archaic form of agriculture, but a modern and productive approach capable of meeting the current challenges of food security and sustainable development.**

Agroecological transition: a gradual adaptation of farming systems

Agroecological transition is a **process of agricultural system evolution** that consists in adapting production practices to local ecological and socio-economic specificities. It is based on the gradual introduction of alternative techniques that reduce or even eliminate dependence on chemical inputs.

It requires action at **different scales** (farms, territories, and upstream and downstream production chains) and involves the commitment of **various stakeholders**: farmers, researchers, public and private institutions, civil society organisations and consumers. This transition involves creating **access to essential services for producers**, such as credit, seeds, organic inputs, small-scale mechanisation, infrastructure and veterinary services. It also facilitates **the processing and marketing of agricultural products** through appropriate certification systems and better market information, giving producers access to transparent and remunerative supply chains.

Agroecology and ECOWAS

The Agroecology Programme in West Africa (PAE)

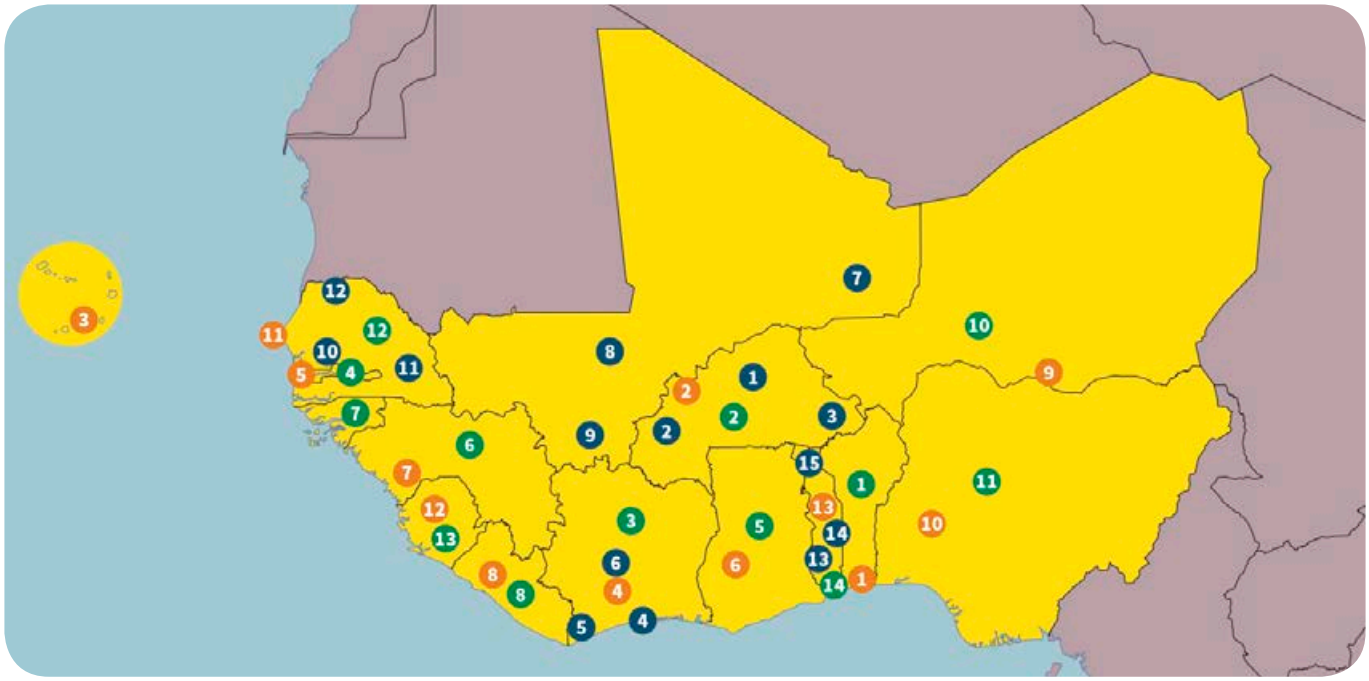
The Agroecology Programme in West Africa (PAE) was implemented between 2018 and 2025 in the 15 ECOWAS member states. It aims to improve the performance of family farms in order to achieve food security, higher incomes and greater resilience to climate change, while promoting processes to preserve and restore the state of cultivated and natural ecosystems. The programme is based on two main projects:

- The Agroecological Transition Support Project (PATAE), funded by **Agence française de développement (AFD)**, with a budget of €8 million.
- The Support Project for the Dissemination and Implementation of Good Practice in Sustainable Agricultural Intensification (PAIAD), funded by the **European Union**, with a budget of €8 million.

The programme is structured around several key components:

1. Support to agroecological transition for local players: implementation of **15 pilot field projects** promoting agroecological practices.
2. Training and capacity building: strengthening the agroecology training offer in the region by supporting **13 training centres** and developing a MOOC on agroecology in West Africa.
3. Advisory services and innovation dissemination: support for **13 partnerships between producer organisations, research and training centres**, and strengthening of national advisory systems.
4. Capitalization and contribution to the development of public policies: support for advocacy via regional consultations with **Alliance 3AO** and national consultations on agroecology with the support of a network of **15 national correspondents** based in the Ministries of Agriculture of the Member States.

Map of projects, centres and partnerships



15 field projects
13 training centres
13 partnerships PO-RC-TC

List of 15 field projects

N°	Country	Project sponsor	Consortium
1	Burkina Faso	TV-BF	GRET · AZN · IRD · LA TRAME
2	Burkina Faso	UPPA-HOUET	INERA · CIRAD · Green Cross Burkina Faso
3	Burkina Faso	ACF	CREAF/INERA · Association BEO-NEERE · UPPA/FEPAB
4	Côte d'Ivoire	ANOPACI	CIRES · PE2D/UNA · PPA/UNA
5	Côte d'Ivoire	AFDI	UIREC · SCZSB · INP-HB
6	Côte d'Ivoire	IECD	CIRAD · PCOPMAYA
7	Mali	UAVES	T&H · URCMP · CFPPAS · Rural Commune of Gounzoureye
8	Mali	FPGL	ACEF · SCOOPSO · CARFS
9	Mali	AMEDD	Rural Commune of Kiffosso1 · CPAK
10	Senegal	ASPRODEB	ISRA · CRES
11	Senegal	ECLOSIO	APESS · COORDIM · COORDID · COOPAM
12	Senegal	THP-SN	ASPSP · UFR-S2ATA/UGB
13	Togo	CED	MAPTO · CADI-Togo
14	Togo	ETD	CPC-Togo · OADEL
15	Togo	RAFIA	UROPC-S · SAM
NGO · PO · Private · Research-Training · Local authority			

List of 13 training centres

N°	Country	Name of centre	N°	Country	Name of centre
1	Benin	ORAD	8	Liberia	TAVTC
2	Burkina Faso	CPR de Kodougou	9	Niger	IPF KAOURA Matamèye
3	Cape Verde	CEFPSCz	10	Nigeria	ARMTI
4	Côte d'Ivoire	ANADER Gagnoa-Lakota	11	Senegal	Ferme des 4 Chemins
5	Gambia	Pirang Mixed Farming Centre	12	Sierra Leone	University of Makeni Agroecological Training Centre
6	Ghana	KITA	13	Togo	CARTO
7	Guinea	CVF de Bamban			

List of 13 partnerships PO-RC-TC

N°	Country	Leader	Consortium
1	Benin	FUPRO ●	INRAB ● SolCA ●
2	Burkina Faso	ARFA ●	The Neerbûli and Maasom Federation ● IRSAT ●
3	Côte d'Ivoire	AGRINNOV ●	Cooperative of yam producers in Kouassi Kouassikro, Laoudi Bâ, Dabakala and Tieningboué ● CSRS ●
4	Gambia	Departement of Agriculture/MoA ●	NACOFAG ● NARI ●
5	Ghana	CNTA ●	Award Winners' Association ● CIR-CSIR ●
6	Guinea	IRAG ●	CNOPG ● SEPROCA ●
7	Guinea-Bissau	Associação Asas de Socorro ●	APALCOF ● INPA ●
8	Liberia	AfricaRice ●	Sua-Yelle Multipurpose Cooperative ● Catalyst ●
9	Niger	INRAN ●	FUMA GASKIYA ● UDDM ●
10	Nigeria	IAR/Ahmadu Bello University ●	SOFAN ● NAERLS/Ahmadu Bello University ●
11	Senegal	CNCR ●	ISRA ● PPD Training Centre ●
12	Sierra Leone	PEMSD/MoA ●	Bid Network SL National Cooperative ● Extension Service Division/MoA ●
13	Togo	ITRA ●	CTOP ● ICAT ●
PO ● Research ● Training ●			

Focus on the PATAE

PATAE provided financial and methodological support for pilot projects in five West African countries: **Burkina Faso, Côte d'Ivoire, Mali, Senegal and Togo**. The aim of these projects was to demonstrate the viability of agroecological agriculture and to promote the dissemination of good practice.

The projects financed over a period of approximately **3 years** were selected following a call for proposals, which identified **15 pilot projects** led by consortia bringing together at least **three types of player**: a development operator, a group of producers wishing to commit to the agroecological transition, a research and development or training organisation, and a local/territorial authority. The projects are located in different agroecological or agro-climatic zones and when they overlap in the same zone, the innovations promoted differ.

Capitalizing on experience

A capitalization process has been set up to analyse the results of the pilot projects and encourage their dissemination. The aim is to provide technical, economic, social and environmental references on agroecological practices and to identify the obstacles and levers for scaling up. This approach enables innovations to be disseminated to agricultural stakeholders so that they can adapt them to their own contexts. Finally, it helps to draw cross-cutting lessons to support the agroecological transition and identify incentive measures that can be scaled up by public authorities.

Field projects detail

N°	Country	Project sponsor	Consortium	Project name	Subvention
1	Burkina Faso	NGO Terre Verte (TV-BF)	GRET – AZN – IRD – LA TRAME	Sharing the Sahelian Bocage (BSP)	304,999 €
2	Burkina Faso	Provincial Union of Agricultural Professionals of the Hauts-Bassins (UPPA-HOUET)	INERA – CIRAD – Green Cross Burkina Faso	Improving the production and use efficiency of organic manure in production systems in western Burkina-Faso (APEUFO)	304,955 €
3	Burkina Faso	Action contre la faim, Burkina-Faso mission (ACF)	CREAF/INERA – Association BEO-NEERE – UPPA/FEPAB	Innovative multi-stakeholder projects for the potential scaling-up of agroecological practices (PATEB)	305,000 €
4	Côte d'Ivoire	National Association of Professional Agricultural Organisations of Côte d'Ivoire (ANOPACI)	CIRES – PE2D/UNA – PPA/UNA	Setting up integrated fish farming production systems in Grand-Lahou	274,418 €
5	Côte d'Ivoire	French Farmers for International Development (AFDI)	UIREC – SCZSB – INP-HB	Farmers' organisations, research and businesses promote the sustainable effects of agroecology, with a view to scaling up (VITAL)	298,910 €
6	Côte d'Ivoire	European Institute for Cooperation and Development (IECD)	CIRAD – PCOPMAYA	Support for agroecological transition in the market gardening sector in Côte d'Ivoire (TAMCI)	304,960 €
7	Mali	Union for an Ecological and United Future (UAVES)	T&H – URCMP – CFPPAS – Rural Commune of Gounzoureye	Supporting Farmers' Organisations to innovate, adapt family farming systems and manage natural resources sustainably through agroecology (AOPAE)	304,844 €
8	Mali	Fondation Paul Gérin-Lajoie (FPGL)	ACEF – SCOOPSO – CARFS	Support for agroecological transition in Mali through synecoculture (ATAMS)	304,392 €
9	Mali	Malian Association for Awareness of Sustainable Development (AMEDD)	Rural Commune of Kiffosso1 – CPAK	Agroecological intensification and sustainable management of natural areas and resources in southern Mali (IAE)	304,905 €
10	Senegal	Senegalese Association for the Promotion of Grassroots Development (ASPRODEB)	ISRA – CRES	Project to support the resilience of agropastoral family farms (PAREFA) to the effects of climate change	302,854 €
11	Senegal	ECLOSIO	APESS – COORDIM – COORDID – COOPAM	Yéssal sunu mbay (ASN): Cleaning up our agriculture	305,000 €
12	Senegal	The Hunger Projet Sénégal (THP-SN)	ASPSP – UFR-S2ATA/ UGB	Agro-ecological intensification and adding value to the products of family farms (PIAV-PEF)	240,474 €
13	Togo	Centre for Ecology and Development (CED)	MAPTO – CADI-Togo	Promotion of agro-ecological family farms producing maize and soya for sustainable incomes in the Plateaux region of Togo (PEFARD-TOGO)	304,736 €
14	Togo	Enterprise, Territory and Development (ETD)	CPC-Togo – OADEL	Project to support the consolidation and scaling-up of agroecological practices in the Plateaux and Central regions (ProCEPA)	303,870 €
15	Togo	Research, Support and Training for Self-Development Initiatives (RAFIA)	UROPC-S – SAM	Sustainable intensification of agroecological practices in the Savanes region (IDPA-S)	304,892 €

Further reading on good agroecological practices

Innovative technical systems for agroecological intensification. Collection of innovations tested in Bukina Faso, Mali and Senegal as part of the FAIR Sahel programme. 2025.
https://www.fair-sahel.org/ressources/publications

The FAIR Sahel programme has recently characterised various innovative technical systems for agroecological intensification, which will be tested with groups of male and female farmers in Burkina Faso, Mali and Senegal between 2021 and 2024. This book contains 14 innovation sheets divided into three main themes: 1) Integration of agriculture and livestock; 2) Cultivated biodiversity; 3) Soil fertility management. Each fact sheet describes the technical innovation, the technical and economic results obtained and the conditions for accessing and appropriating the innovation.

As part of the GCCA+ AO project, financed by the European Union and implemented by Expertise France, under the political and institutional leadership of ECOWAS, and with the technical partnership of the CILSS, several capitalization tools have been produced:

Synthesis for the general public on the contribution of pilot projects to adaptation and mitigation (EN, FR, PT). ECOWAS, 2023. 19 p.
FR : https://ecowap.ecowas.int/see-document/403
EN : https://ecowap.ecowas.int/see-document/384
PT : https://ecowap.ecowas.int/see-document/404

The summary looks at the results and lessons learned from each of the 15 AIC and agroecology pilot projects implemented between 2020 and 2022 by civil society organisations with the support of the GCCA+AO project.

Data sheets on "Good agroecological, resilient and low-carbon practices". ECOWAS, CILSS, 2023.
Biochar.
FR : https://ecowap.ecowas.int/see-document/397
EN : https://ecowap.ecowas.int/see-document/382
Photovoltaic irrigation.
FR : https://ecowap.ecowas.int/see-document/398
EN : https://ecowap.ecowas.int/see-document/379
Intelligent irrigation.
FR : https://ecowap.ecowas.int/see-document/396
EN : https://ecowap.ecowas.int/see-document/381
The Smart Valley approach.
FR : https://ecowap.ecowas.int/see-document/399
EN : https://ecowap.ecowas.int/see-document/380

These factsheets, based on experience in the field, highlight the technical characteristics, environmental benefits and implementation conditions of each practice.

Compendium of low-carbon agroecological best practices in the Sahel and West Africa. CILSS, ECOWAS. ECOWAS, CILSS. 2021. 193 p.
https://ecowap.ecowas.int/see-document/497

The compendium contains 25 technical fact sheets describing good agroecological practices that are low in carbon and resilient in the face of climate change, grouped into four categories: 1) Conserving water, soil and nutrients; 2) Improving/increasing agricultural production; 3) Rehabilitating the production and service functions of the land; 4) Adapting to and mitigating the effects of climate change.

Guide: Agroecology in practice. More than 25 years of learning in 26 countries. AGRISUD International, 2020.
https://www.alimenterre.org/system/files/inline-files/Agrisud_Guide_Agroecologie_2020.pdf

After 28 years spent promoting small-scale family farming as a remedy for food crises and a lever for development in developing countries, Agrisud is offering a guide to good agroecological practice. It covers the fundamentals of agroecology, the main production systems and 36 associated agroecological practices classified into six themes: water management, fertility management and fertiliser production, market gardening, fruit growing, food crops and fodder crops.

Capitalization sheets on good resilience practices in West Africa and the Sahel. CILSS, 2017. 72 p.
http://inter-reseaux.org/IMG/pdf/fiches_bonnes_pratiques_agir-2.pdf

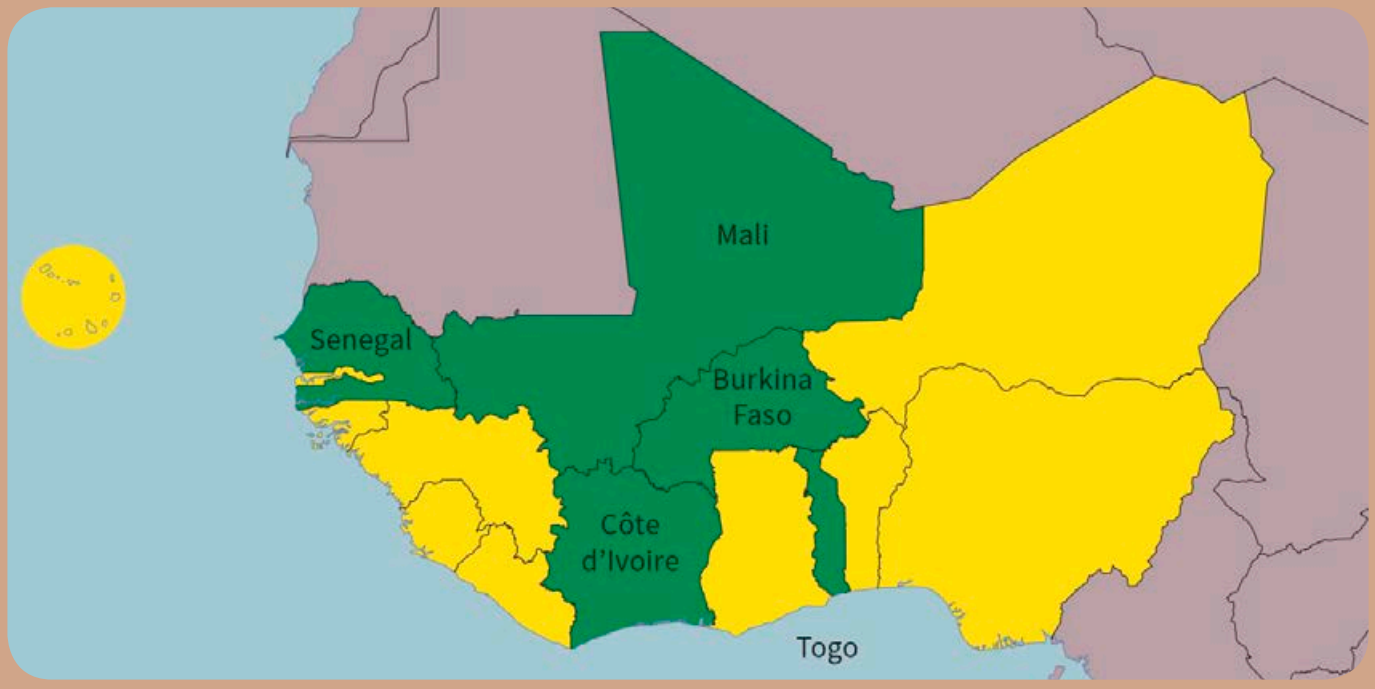
This collection, produced as part of the AGIR initiative, brings together fact sheets describing local resilience practices implemented in Mali, Niger, Burkina Faso and Togo. Each sheet documents an endogenous practice in terms of resource management, community organisation or pastoral adaptation, with a focus on highlighting farmers' knowledge.

Overview of field projects

15 pilot projects in the field supported with a budget of:

4.3 M€

5 ECOWAS countries:



producers trained in agroecological practices

> 62,500

surface of farmland covered by agroecological practices

12,350 ha

compost produced

40,000 t

Partie II. The agroecology handbook

Section A. Good agroecological practices

Presentation of best practices

Agroecological practice class	N°	Page	Name of the good practice	Type	Scale	Crops	Country – Project leader
Crop diversification and rotation	1	p. 17	*Cajanus cajan* and *Mucuna pruriens* fertilizing and cover crops	technical	plot	maize, soya	Côte d'Ivoire – AFDI Togo – CFD
crop – livestock integration	2	p. 23	Use of animal traction	technical	farm	all crops	Togo – RAFIA
Soil and water management and conservation	3	p. 29	Land management using contour ridges	technical	plot	cereals, cotton	Mali – AMEDD
	4	p. 35	Optimization of compost use	technical	plot	all crops	Togo – CED Burkina Faso – UPPA/H
	5	p. 43	Heap composting	technical	farm	cereals, tuber crops	Burkina Faso – UPPA/H
	6	p. 49	Bokashi	technical	farm	cereals, vegetables, citrus	Burkina Faso – ACF
	7	p. 55	Compost pits	technical	farm	all crops	Sénégal – ASPRODEB
Biological control and use of alternatives to pesticides	8	p. 61	Localized weeding in cereal farming in the Sahel	technical	plot	cereals	Burkina Faso – Terre Verte
	9	p. 67	Biopesticides	technical	plot	all crops	Mali – AMEDD Mali – UAVES
Farmers' seeds	10	p. 75	Farmer' seeds	technical	plot	vegetables	Mali – UAVES
Cross-cutting/other	11	p. 81	Access to agricultural land for women and young people	social	plot	vegetables	Sénégal – ECLOSIO
	12	p. 87	Aflasafe SN01, a method to combat aflatoxins	technical	plot	groundnut, maize	Sénégal – ASPRODEB
	13	p. 93	Family vegetable garden	technical	plot	vegetables	Sénégal – ECLOSIO
	14	p. 101	Community listening clubs	social	landscape	all crops	Togo – ETD
	15	p. 109	Participatory guarantee systems	financial	plot	all crops	Togo – RAFIA

legend	Type		Scale		Crops					
	technical		plot		all crops		tuber crops		citrus	
	social		farm		cereals		maize		soya	
	financial		landscape		vegetables		cotton		groundnut	

BP1: *Cajanus cajan* and *Mucuna pruriens*, fertilizing and cover crops to boost maize production sustainably

Presentation of best practice

Cajanus cajan and *Mucuna pruriens*

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Prefectures of Haho, Moyen Mono and Ogou (25 villages) in Togo and the Department of Bouaflé (Côte d'Ivoire)	Sudanian climate (central region, Togo) and humid climate (mesophilic savannah zone, Côte d'Ivoire)	07/19 – 12/22 (PEFARD) 07/19 – 06/22 (VITAL)

Combining maize with one of these two legumes (Cajanus cajan and Mucuna pruriens) helps to maintain soil moisture over the long termimprove soil fertility and considerably increase the productivity of maize grown in association.

Type: Technical
Scale: Plot
Type of crops grown: Maize, soya
Promoted by:

- The SEPT consortium (Solidarity Consortium for the Development of Togolese Farmers): CED (NGO Centre for Ecology and Development) – CADI Togo (NGO Cooperation to support the integral development of Togo) – MAPTO (Organisation professionnelle agricole Mouvement alliance paysanne du Togo), as part of the "Promotion des exploitations familiales agroécologiques productrices du maïs et du soja pour des revenus durables dans la région des plateaux au Togo (PEFARD)" project (financed by RAAF/ECOWAS, with support from AFD)
- The AFDI consortium (French Farmers and International Development) – UIREC (Inter-Regional Union of Cooperative Societies) – SCZSB (Société coopérative Zone savane de Bouaflé) – INPHB (Institut national polytechnique Houphouët Boigny) within the framework of the project "FOs, research and businesses enhance the sustainable effects of agroecology for a move to a higher scale in Côte d'Ivoire (VITAL)" (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

As a result of unstable rainfall due to climate change, which creates a shortage of rain during key plant development periods, and uncontrolled use of synthetic fertilisers, maize yields have been falling steadily for several years in central Togo and northern Côte d'Ivoire. More generally, there has been accelerated degradation of the land and soil fertility in these regions. Against this backdrop, the PEFARD project in Togo and the VITAL project in Côte d'Ivoire have responded by combining the main crop with leguminous cover crops (*Cajanus cajan* and *Mucuna pruriens*), which fix nitrogen and produce a huge amount of biomass. This combination allows maize, soya and other crops to benefit from the increased moisture and fertilising organic matter produced by these legumes.

Problems the practice is intended to address

- Soil degradation with reduced fertility
- Periods of water stress during the crop cycle
- Lower yields

Objective:
- Protecting the soil from bad weather (rain erosion, wind turbines, exposure to the sun)
- Maintaining soil moisture
- Restoring soil fertility
- Increase crop yields, especially maize

Beneficiaries: Rural producers
The PEFARD project in Togo involved 1,009 producers, including 547 women, organised into cooperatives in 25 villages in the prefectures of Haho (5 villages), Moyen Mono (14 villages) and Ogou (6 villages).
For the VITAL Côte d'Ivoire project, volunteer maize growers within the Société Coopérative Zone Savane de Bouaflé (SCZSB).

Implementers and roles

For the PEFARD project:
- **Farmer trainers and managers:** local technical support for cooperatives by accompanying cooperative members in activities carried out as part of a Farmer Field School (FFS)
- **Cooperatives:** supply of improved maize and soya seeds
- **Local traders:** supply of *Cajanus cajan* and *Mucuna pruriens* seeds

For the VITAL project:
- **Research structure (INPHB):** introduction of experience through several experiments on 18 plots in the farming environment
- **AFDI facilitators (18 in total):** monitoring of experiments, training of relay farmers (48 in total) who are members of the SCZSB on the technical itinerary for implementing this maize-*Cajanus* combination and compost production
- **Network of relay farmer-animators:** management of work on plots and dissemination of practices to other producers

Cajanus cajan in a maize field

Maize seedlings on *Mucuna* mulch

Stages of implementation

Introduction to the practice

Various activities were carried out to introduce the experiment:

- Meeting diagnose, inform and raise awareness of constraints and possible responses
- Selection of volunteer/experimental producers
- Conducting experiments in school fields

Technical itinerary

The case of *Cajanus cajan* associated with maize

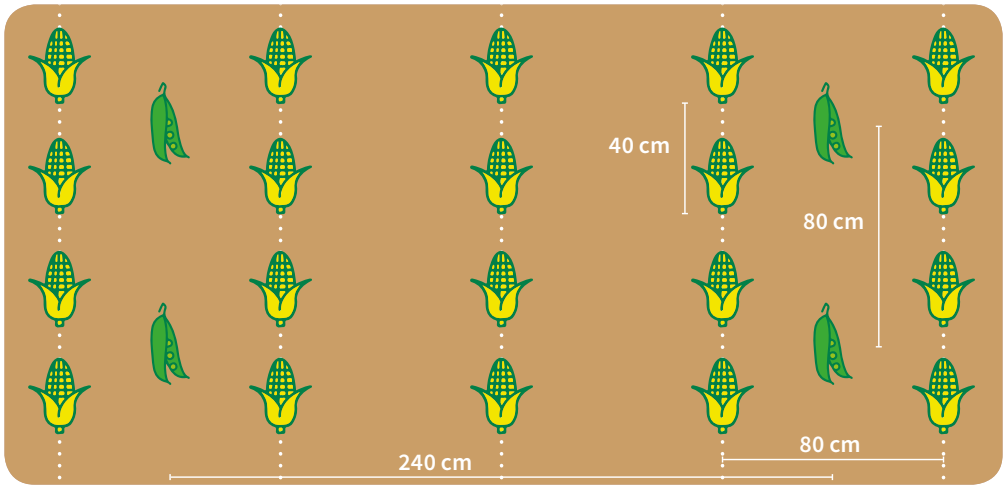
Cajanus cajan is used in combination with maize The main stages are summarised below:

- *Cajanus* seed dose: 15 kg per hectare
- Intersowing *Cajanus cajan* (0.80 m between bunches and 2.40 m between rows), about 15 days after sowing maize (0.40 m between bunches and 0.80 m between rows), after weeding; this amounts to planting 1 row of *Cajanus* after 3 rows of maize
- The rest of the work (ridging and spreading if necessary) follows until the maize is harvested
- *Cajanus cajan* remains in the field for at least three years, harvested and pruned at the start of each season. The pruned leaves are ploughed into the soil.

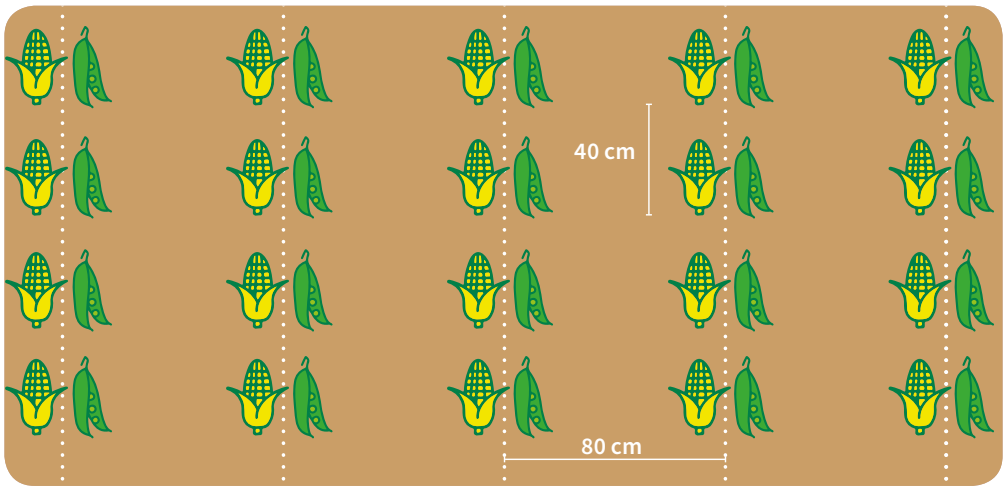
NB: In the case of the VITAL project, the *Cajanus cajan* plant is cut in the second year and the maize is sown after the plot has been mulched.

The case of *Mucuna pruriens* associated with maize

- *Mucuna* seed dose: 30 kg per l'hectare
- Intercropping sowing of *Mucuna pruriens* (0.40 m between bunches and 0.80 m between rows), 30 days after that of maize (0.40 m between bunches and 0.80 m between rows). *Mucuna pruriens* is sown in the same row as the maize, on the side of the mound or ridge to allow the young plants to benefit from the sunshine. *Mucuna pruriens* plants require no special maintenance
- After the maize harvest, *Mucuna pruriens* continues to grow and its foliage completely covers the soil. The large biomass gradually decomposes, helping to conserve soil moisture. Depending on the quantity of weeds, the next crop can be sown directly into the *Mucuna* mulch without ploughing the field



Cajanus seedlings 15 kg/ha
3 rows of maize and
1 row of *Cajanus*



Mucuna seedlings 30 kg/ha

Resources mobilised

Natural resources: maize seed, *Mucuna pruriens* and *Cajanus cajan*

Physical resources: work equipment/materials (dabas, cutters)

Human resources: sufficient knowledge and know-how to carry out the technique; producers and trainers; the practice requires between 30 and 40 men/day to implement it

Social resources: producer groups

Results obtained

Physical results

Significant increase in maize yields:

- In central Togo (PEFARD), increase from 700 kg/ha to 1,900 kg/ha with *Cajanus cajan* from 700 kg/ha to 2,100 kg/ha with *Mucuna pruriens*
- In the north of Côte d'Ivoire (VITAL), farmers now harvest 12 to 15 sacks of 110 to 120 kg of maize per hectare, compared with 8 sacks before the association with *Cajanus cajan*

Economic impact

At the centre of Togo:

- The reduction in production costs due to the absence/low use of synthetic fertilisers:
  - The use of *Mucuna pruriens* (19,210 FCFA/ha) instead of chemical fertilisers (72,000 FCFA/ha) results in a 73% saving in production costs
  - The use of *Cajanus cajan* (15,550 FCFA/ha) instead of chemical fertilisers (72,000 FCFA/ha) results in a 78% saving in costs
- Additional income for producers from the sale of edible *Cajanus cajan* grains
- Maize production on one hectare with a *Mucuna pruriens* preceding yields a turnover of 609,000 FCFA compared with 528,000 FCFA for production with chemical fertiliser, a gain of 15.34%
- Maize production on one hectare, with a *Cajanus cajan* preceding, results in a turnover of 551,000 FCFA, i.e. a gain of 4.36%
- Margins improved from an average of 307,000 CFA francs to 435,390 CFA francs with *Mucuna pruriens* and 381,050 CFA francs with *Cajanus cajan*

In the north of Côte d'Ivoire, initial economic analyses indicate that farmers' incomes have risen by between 25% and 60%.

Social impact

- More than 80% of beneficiaries (808 cooperators) in central Togo have adopted the use of *Mucuna pruriens* and *Cajanus cajan* in their maize plots.
- Increased household food and nutritional security through the observed improvement in maize yields and the availability of edible *Cajanus cajan* grains. In the Moyen-Mono prefecture, for example, *Cajanus cajan* grains are replacing other foods, to the point where they have become an integral part of household eating habits.
- Combating animal straying (better animal guarding) and vegetation fires to protect fields planted with *Mucuna pruriens* and *Cajanus cajan*. In fact, unlike in previous years, the association plots have kept their plants.
- Greater availability of seeds, which are redistributed to neighbours from year to year
- Renewed interest in agriculture among young people, given the new prospects for the possible development of livestock farming
- Improved access to land for women and young people. A group of around fifty women has been given access to 2.5 ha for joint production.
- Strengthening social ties through collective activities in the school fields, particularly women. Some young people have also succeeded in organising daily exchanges to share experiences, and have even created rotating work groups to increase the available workforce.

Mucuna pruriens cover

Mucuna in a maize field

Environmental impact

- Land restoration resulting in a sustainable improvement in fertility
- Carbon sequestration in the soil with the large biomass produced
- Maintenance and survival of soil micro-organisms (microbiota), resulting in improved biodiversity and health
- Reduced human pressure on forests, as *Cajanus cajan* stems can be used as energy wood

Innovative aspects

- Intensification of the association of *Cajanus cajan* with maize (increase in the density of *Cajanus cajan*), resulting in more biomass.
- Promoting *Mucuna pruriens* as a fertiliser plant (Central Togo)
- Innovation based on producers' past experience while adding a new element, *Cajanus cajan* (North Côte d'Ivoire)

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Destruction of fields by animals (transhumance, roaming)	Continuous monitoring of animals and proper management of vegetation fires within the framework of regulations and capacity building for CVCMs will help reduce the respective impacts of animals and fires Raising farmers' awareness of the need for more rigorous care of their animals
Destruction of fields by vegetation fires	
Difficult access to seeds (unavailability)	Introducing farmers to the systematic harvesting of grain to sell and store for future campaigns
Manual weeding and pruning of Cajanus after 2 labour-intensive years	Working together to reduce the workload per person. What's more, if mulching is done properly, we can see a significant reduction in weed growth

Potential for adoption

There has been a great deal of interest in the practice, particularly in central Togo, due to its obvious advantages (see physical and economic results), its technical accessibility, relatively bearable costs and efforts to disseminate information (awareness-raising meetings and guided field visits).

Challenges and prospects for scaling up

Demand is mainly hampered by a lack of seeds and crop attacks. We will therefore need to:

- Develop communication on *Mucuna pruriens* and *Cajanus cajan* as cover crops that can be combined with maize
- Continuing to organise information and awareness-raising events on maize-legume combinations and in general
- Support producers' efforts by helping to make *Mucuna pruriens* and *Cajanus cajan* seeds more widely available. This could take the form of support for plots
- Set up functional cooperatives committed to promoting the practice (collection of seeds and distribution/sale)
- Promote livestock rearing in enclosures to reduce crop damage caused by animals wandering off

Testimony

"With the results I got, some growers approached me to find out my secret"

"My name is Leda Bawélima, I am 45 years old and I am a farmer member of the Gnaguibi biliga cooperative in the village of Rodokpé in the Canton of Kpédomé (Haho Prefecture; Plateaux Region of Togo).

I have a 0.5 hectare plot on which I produce mainly maize and a little soya every year to feed my family. However, for some time now my soil has been impoverished and no longer produces as much as it used to, forcing me to use chemical fertiliser when I can afford it. It was at this point that I became aware, along with other people, of agroecological production. At first, the concept was new to me, but with the training we received, I understood the importance of agroecology.

In our area, Cajanus cajan *is well known and used, either to demarcate plots of land or scattered (in low densities) in the fields. Its seeds are used for human consumption, and its leaves for animal feed and medicinal purposes.* Mucuna pruriens*, on the other hand, was hardly known or used here. I got hold of some through our agricultural technician, following the training I received at our Champ École Agriculteur (CEA).*

Since then, I've been using it in my maize field. To start with, I only sowed 0.25 ha. The following year, I ploughed and sowed the maize on the aforementioned plot without applying any mineral fertiliser as in previous years. And what a surprise! Not only did the maize plants develop normally until the cobs reached maturity, but I was also able to harvest around 5 x 100 kg bags of maize, compared with just 02 x 100 kg bags before I added Mucuna pruriens.

With the results I got, some growers approached me to find out my secret. So I shared a quantity of Mucuna *seeds with them so that they could try it too. I'm getting ready to follow them so that they can use it properly. I'm also currently acting as a resource person for a few producers in my locality who are showing an interest in the practice. I would like to thank the initiators of this project, who have really opened my eyes, and I beg them to continue to help us develop these beneficial farming practices."*

To find out more

Intercropping maize and pigeon pea. Access Agriculture. 9'54".
https://www.accessagriculture.org/fr/culture-intercalaire-du-mais-et-du-pois-cajan

Regenerating soils with Mucuna. Access Agriculture. 13'49".
https://www.accessagriculture.org/fr/regener-er-les-sols-avec-mucuna

Practical sheet. Maize–*Cajanus cajan* Association. AFDI. 2 p.
https://mesecops.araa.org/document/projects/45/Fiches%20pratiques%20projet%20VITAL-Association%20mais-cajanus.pdf

Note de synthèse. Agroecological experiments on the cocoa and maize sectors in Côte d'Ivoire: summary and initial results. AFDI. 29 p.
https://mesecops.araa.org/document/projects/45/2023_Synth%C3%A8se%20Exp%C3%A9rimentations%20agro%C3%A9cologiques_Vital_C%C3%B4te%20d'Ivoire.pdf

Agroecological practices in the maize sector in Côte d'Ivoire. AFDI. 13'10".
https://youtu.be/aXi4FvF9fME

Maize and pigeon pea association in Côte d'Ivoire. Testimony of Kouadio Konan, producer. AFDI. 4'01".
https://youtu.be/nIDk1QpExmM

Maize and pigeon pea association in Côte d'Ivoire. Testimony of Nanga Sorho, producer. AFDI. 4'01".
https://youtu.be/6mXz169qWU0

Maize and pigeon pea association in Côte d'Ivoire. Testimony of Ousmane Soro, producer. AFDI. 5'32".
https://youtu.be/h2XMigSC_Ps

Maize and pigeon pea association in Côte d'Ivoire. Testimony of Tchege Yeo, producer. AFDI. 3'54".
https://youtu.be/jzsPoyHmT-w

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BP2: Use of animal traction to improve the efficiency of farm work on women's farms

Presentation of best practice

animal traction

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Tône and Cinkassé prefectures (Savanes region, Togo)	Sudanian climate	07/19 – 06/22

The use of animal power through the mechanisation of certain tasks (ploughing, transport) on women's farms makes it possible to implement agroecological practices more efficiently, saving time and reducing the drudgery of work.

Type: Technical
Scale: Farm
Type of crops grown: All crops

Promoted by: Consortium RAFIA (Research-Support and Training for Self-Development Initiatives), UROPC-S (Regional Union of Cereal Producers' Organisations of the Savanes region), SAM (Millennium Synergy of Action) as part of the "Intensification durable des pratiques agroécologiques dans la région des Savanes (IDPA-S)" project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

While women in the Nadjoundi, Kourientré, Sanfatoute and Poissongui cantons of Togo's Savanes region are heavily involved in farming operations, the productive agricultural capital, in particular the carts, draught oxen and ploughs used to collect and transport crops and inputs (compost, seedlings, straw, cow dung, water, stone blocks for stone barriers, etc.) and to work the soil, is held by men. Women, who for the most part do not have the means to acquire this productive capital, carry out these tasks manually. In addition to the arduous nature of the work involved in carrying them on their heads and tilling the soil with low-performance tools, the time required for these various operations means that they can only farm small areas, and acts as a brake on the adoption of agroecological practices such as making compost, creating stone barriers or reforestation, which represent an additional workload . The introduction of mechanisation of certain operations for the benefit of women, thanks to the support of the NGO RAFIA (IDPA-S project), therefore appears to be a way of increasing the efficiency of operations on women's farms and encouraging the adoption of agroecological practices.

Ploughing with two oxen

Problems the practice is intended to address

- The arduous nature of certain agricultural tasks performed by women
- The considerable amount of time required to carry out farming operations on non-mechanised women's farms

Objective:
Make it easier for women to take part in the agroecological transition by reducing the arduousness of the work and saving them time.

Beneficiaries: women producers
Promotion of the practice targeted 267 people, mainly women (208) and young people (225) from the Unions of Cereal Producers' Organisations (UOPC), who were socio-economically vulnerable, able to use the equipment provided (cart and plough), make a financial contribution (40% of the cost of the kit) ensure collective management of the equipment (beneficiaries grouped into 3 or 5 groups).

Implementers and roles

- **Associations and NGOs (RAFIA, UROPC-S, the Cantonal Unions of the 4 cantons of the producers' project in the case of the IDPA-S project):** developing the strategy for implementing the activity with the producers, acquiring donkey carts, ploughs, donkeys and oxen, etc.
- **Women producers:** using donkey carts to transport straw, water, compost, rubble and seedlings, and ploughs and oxen to plough their fields and provide services.

Stages of implementation

1 Definition of the strategy for acquiring and distributing the equipment

Done at a preliminary meeting between RAFIA, UROPC-S and the leaders of the Unions Cantonales des Organisations de Producteurs de Céréales:

- Composition of the kits: 1 cart and 1 donkey for the "transport kit", 1 plough and 2 oxen for the "ploughing kit".
- Criteria for selecting beneficiaries and financial contribution: 40% of the cost of purchasing the kits (FCFA 110,000 out of FCFA 275,000 for the transport kit and FCFA 200,000 out of FCFA 500,000 for the ploughing kit).
- Criteria for selecting service providers to supply the kits: preference has been given to local companies for carts and ploughs; donkeys and oxen are purchased on local markets by a committee set up for this purpose.
- Drawing up templates for requests for support, interview guides and assessments of kit use
- Process to be followed, from informing beneficiaries to distributing kits and raising awareness of their use for collective and sustainable management.

2 Informing grassroots farmers' organisations

It's done on the opportunity and methods of support for the purchase of kits.

3 Receipt of applications and shortlisting of beneficiaries

A priority is given to groups with a high number of vulnerable members. The selected groups are then invited to pay their financial contribution into the project's bank account.

4 Confirmation of payment of financial contributions

The payment is done on the basis of payment slips submitted to the project's Administrative and Financial Manager.

5 Launch of calls for tender for the manufacture of carts and ploughs

Verification of compliance with quality standards (technical characteristics specified in the calls for tender)

6 Purchasing donkeys and oxen and veterinary follow-up

Setting up a purchasing committee made up of a representative from each cantonal cereal producers' union, the president of the UROPC (chairman of the purchasing committee), the project's administrative and financial manager (treasurer), the project's technical manager and a veterinary surgeon, responsible for ensuring the beneficiaries' contributions and purchasing the animals. Once the donkeys and oxen have been purchased, the committee's vet provides first aid (vaccination, deworming).

7 Distribution of kits to beneficiaries

Once acquired, the carts, donkeys, ploughs and oxen are transported directly to the cantonal unions, which distribute them to the beneficiaries.

8 Raising awareness among beneficiaries

It's about the use of kits and drawing up collective management rules.

Each group elects a chairperson, a secretary and a treasurer: the chairperson looks after the kit and the secretary is responsible for recording all transactions carried out with the kit.

When a non-member of the group requests ploughing or transport services, he or she should contact the group chair-

man, who will estimate the surface area of the field or the load to be transported in order to fix the amount of the services requested with the secretary or treasurer. The person is then invited to pay the amount due into the group fund.

If the President requests ploughing or transport services, the Secretary and Treasurer or another member of the group will visit the site to estimate the size of the field or the load to be transported.

Each group receiving the kits is made aware of their proper use. Beneficiaries are also reminded of the importance of good cohesion between members and the obligation to contact a local veterinarian to monitor the oxen and donkeys.

9 Conditions for using the kits

The transport and ploughing kits are used by members of the beneficiary groups primarily to plough their fields and carry out transport tasks in the implementation of agroecological practices. The kits are also used to provide services to third parties at a cost of FCFA 20,000/ha for non-members and FCFA 10,000 to 15,000/ha for members, depending on the locality. Transport costs vary according to distance and the goods being transported. Half the price is charged to group members.

10 Evaluation of kit use

At the end of the campaign, an evaluation of the use of the kits is carried out using an interview guide. This evaluation is used to determine the loads transported and the revenue generated, to identify any difficulties encountered and to define a strategy for improving the use and renewal of the kit.

Resources mobilised

Physical resources: a kit consisting of two oxen and a plough (ploughing) or a cart and a donkey (transport)

Human resources: 2 people for the ploughing kit and 1 person for the transport kit

Social resources: producers' organisation; purchasing and management committee

Estimated costs per hectare

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Ploughing kit			
Cost of equipment and technical materials		Cost of labour	
1 Plough (5-year depreciation)	20,000	Ox transport	10,000
2 Oxen (depreciated over 5 years)	80,000	**Total estimated cost**	**110,000**
Transport kit			
Cost of equipment and technical materials		Input costs	
1 Cart (depreciated over 5 years)	28,000	Transport	5,000
1 Donkey (5-year depreciation)	27,000	**Total estimated cost**	**60,000**

Results obtained

Physical results

- Average increase in sown area of 0.20 ha
- 20% time saving when filling compost pits
- 20 tonnes of compost produced and transported, compared with half that produced without a transport kit

Economic impact

- Production costs reduced by 30,000 FCFA/ha, corresponding to a reduction in the use of chemical fertiliser of 100 kg/ha on average
- Increased income for women

Social impact

- Economic empowerment and strengthening of the social status of women and young people who have benefited from support for access to productive capital
- New source of income for young people and women benefiting from transport and ploughing services
- Other women begin to receive support from their husbands to gain access to production capital
- Strengthening the local dynamic for integrating women and young people into decision-making bodies by setting up mixed groups (young people, men, women) to acquire and use the kits
- Increased demand for transport and ploughing services
- Improving well-being at work: reducing drudgery and saving time

Environmental impact

- Reducing the use of chemical fertilisers
- Soil and water conservation works (CES)

Innovative aspects

- With this initiative, women now have access to productive capital, which has never been the case before
- The social dynamic maintained by solidarity groups to access kits

Donkey cart

Ploughing with a pair of oxen harnessed to a plough

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Theft of oxen in certain localities (2 oxen stolen) Inadequate means of water extraction	– Alert the national gendarmerie – Better monitoring of purchased beef
Bias in targeting beneficiaries: Provision of incorrect information when applications are registered by members of the same household	Discreet surveys (with witnesses) are carried out
Risk of misappropriation of beneficiaries' contributions by leaders: some beneficiaries, not used to the banking system, entrust their money to the leader of the PO or UOPC for payment	Beneficiaries prohibited from making third-party payments
Risk of unequal distribution of kit use: In some groups, members contribute unequally, and those who have contributed most tend to monopolise the kit	Raising group awareness of the importance of mobilising equal shares
Risk of misappropriation of kits: some some POs pay the financial contributions on behalf of the groups and manage the kits directly	Conduct in-depth investigations to detect and put a stop to this type of fraud
Lack or absence of monitoring of kit use and savings for kit renewal after depreciation	– Introduction of a simplified cash journal tool that beneficiaries can fill in with the help of their literate children or a literate member of the PO – An amount to be saved annually (depreciation) has been determined for each group with a view to renewing the kit

Potential for adoption

The enthusiasm for the practice is real, given the results obtained. All the women who received the kits have fully adopted the practice, and one group of women who received the ploughing kit even acquired an extra pair of oxen. A second group acquired an additional donkey cart, while a third group replaced a sick ox. The fact that the kits were partly subsidised and that they made the work less arduous, less costly and quicker encouraged women to adopt them and the practice to emerge. Another factor encouraging adoption is the simplicity of the equipment in the kits, which makes them easy to maintain, particularly for women.

Challenges and prospects for scaling up

- Reduce the contribution made by beneficiaries in order to reach the most vulnerable people
- Promoting access to credit to purchase kits
- During the beneficiary selection process, in addition to interviews with the groups, carry out additional investigations to limit cases of fraud
- Maintain small local groups, involving local structures throughout the process
- The proposed equipment must meet a real need and the management model must be flexible so that it can be adapted to each group
- Support is needed to ensure the long-term management of equipment (maintenance and renewal)
- Supporting beneficiaries in monitoring their activity (setting up a simplified tool) and determining annual amortisation
- Ensure that beneficiaries are in contact with a vet to monitor the health of their animals

Testimony

"You can't imagine how important this kit [ploughing] is to me"

"My name is Koumminte Sonin, and I'm a 45-year-old member of the Tchegelima group. I come from the village of Nadjoundi (Prefecture of Cinkassé, Savanes Region, Togo). I come from a farming family, and from a very young age I learned from my parents about farming, which I love.

Since I got married and left my parents, I haven't been so lucky. My husband and I have a plot of about 2 ha and I farm ¼ ha myself.

In the region, agricultural equipment and materials in rural areas are generally owned by the men; the woman is a helper for her husband in agricultural activities. As such, if a woman has her own plot of land and wants to farm it, she has to make sure that she has finished assisting her husband first. Even I sometimes have to wait for the men to finish their turn before I hire out the oxen. In the end, I fall behind the best time for ploughing at the start of the rainy season.

However, in the 3–4 years that I have been taking part in the activities of the RAFIA NGO project, with the encouragement of my husband, I have had easier access to ploughs and oxen, having joined a solidarity group of five (05) people. In addition to easier access to ploughing equipment, the project has helped us to organise ourselves into a cooperative and to strengthen our technical skills.

Today, I plough my plot on time and the drudgery of my work has been reduced. My children, who were dreading the long, hard ploughing, now have peace of mind. The oxen are there now and do the ploughing in no time.

We also hire out the oxen, which brings in a bit of money for our group. In 8 months, we've saved around 100,000 CFA francs.

I'm hoping that I'll be able to save some money so that I can buy my own animal traction kit…"

"When we received the kit [transport], we organised ourselves so that each member would be satisfied"

"My name is Koula Madja, I come from the village of Nadjoundi (Nadjoundi canton, Cinkassé prefecture, Savanes region, Togo). I am 39 years old, married and the mother of 04 children. I'm a member of the Gbadou-Man cooperative, which has benefited from the agroecological project run by the NGO RAFIA.

In our region, the use of donkeys for various tasks is common practice. However, I didn't have access to one, which made my work in the fields, in particular transporting crops and crop residues, carrying cow dung to make compost, carrying water, transporting compost, etc., quite arduous. In fact, sometimes with the help of my children, I often have to travel long distances with basins carried on my head to transport these materials.

This situation, which lasted until 2019, meant that I was behind schedule when it came to respecting the agricultural calendar. But this year, the people in charge of the NGO RAFIA came to talk to us about the IDPA-S project. Having shown great interest in the project, RAFIA organised us into small solidarity groups of five (05) people within a cooperative in order to benefit from the subsidised donkey cart operation. I personally contributed 22,000 FCFA to my group.

When we received the kit, we organised ourselves so that each member would be satisfied by a system of rotation, and it works quite well. Personally, I'm really pleased with it. Transporting my compost is easier and takes less time than before. Apart from compost, I also use the cart to transport crops, sand and stones, and to take produce from the house to the market and vice versa. Our group also hires out our kit to third parties for 1000–1500 FCFA/km depending on the load transported (half price for group members). With this income, we plan to buy a second cart in the coming months and set up a mutual aid fund to cover any needs we may have.

My hope is to be able to buy my own cart in the coming months so that I can make the most of it. One of the difficulties we had at the beginning, which is a concern for me, is taking care of the donkey in the event of illness. Fortunately, the project put us in touch with a vet at one point…"

To find out more

Guide méthodologique pour l'équipement de petits groupes de producteurs en charrettes asines. AVSF, UROPC-S, ICAT, Inades formation, Rafia. 21 p.
https://www.avsf.org/app/uploads/2023/12/avsf_guide_charettes_asines_togo.pdf

Tapsoba S.E., 2013. Introduction et évaluation technique de la traction monobovine avec le jouguet IRAD-BF à l'Ouest du Burkina Faso, Mémoire d'ingénieur d'agriculture, Centre agricole polyvalent de Matourkou. 67 p + annexes
https://auf.hal.science/hal-00911548/document

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BP3: Land management using contour ridges (ACN), a technology for conserving moisture and fertility

Presentation of best practice

land management

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 13 villages in the rural commune of Kiffosso 1 (Sikasso Region, Mali)	Sudanian and Sudano-Sahelian climate	06/19 – 06/22

Contour land management is an agricultural technique for reclaiming land that consists of building earthen bunds following the contour lines and cultivating the spaces between the lines, which are left grassed. Crops are grown on ridges that follow the contour lines.

Type: Technical
Scale: Plot
Type of crops grown: Cereal crops (sorghum, mil, maize, rice) and cotton
Promoted by: NGO AMEDD, Sènèyiriwaton Cooperative and the rural commune of Kiffosso1 as part of the "Agroecological intensification and sustainable management of natural areas and resources (IAE)" project ((PATAE/RAAF funding, with support from AFD)

Context of the experience

In the rural commune of Kiffosso1, like most areas with a large agricultural footprint, the planting density is very often exceeded and the land is severely degraded as a result of almost permanent exploitation. For a long time, the only solutions were to build stone barriers and fascines, to overuse chemical fertilisers and, in some cases, to increase the area under cultivation to make up for the shortfalls resulting from falling yields. Contour land management (CLM), promoted by the IAE project, appears to be an appropriate response to soil degradation and loss of fertility. It reinforces the measures already in place to revitalise the soil and reduce the sometimes excessive use of fertilisers and chemical products.

Construction of earth embankments

Problems the practice is intended to address

- Soil erosion or excess water in the fields
- Land degradation (loss of nutrients and water
- Declining soil fertility
- Falling agricultural yields

Objective: To evacuate excess water and improve water infiltration for the benefit of crops, in order to achieve immediate yield increases

Beneficiaries: Rural producers
The IAE project reached 1,200 farmers in the thirteen (13) villages of the rural Commune of Kiffosso 1 with poor and/or eroded land

Finishing the embankment with a rake to give it a regular shape
(in Agriculture et développement, n°14, June 1997)

Implementers and roles

- **Development NGO (AMEDD for the IAE project):** mobilization of financial resources from RAAF, training and advisory support for producers
- **Sènèyiriwaton Cooperative:** mobilization of producers in each of the 13 villages of the rural commune of Kiffosso1 with a view to carrying out ACNs through a committee of 5
- **Local authorities (the town hall of the rural commune of Kiffosso1):** social mobilization to carry out activities

Stages of implementation

Introduction to the practice

- Raising awareness among
- Identification of beneficiaries
- Survey of needs in each of the 13 villages in the rural commune of Kiffosso1 (diagnosis of the situation of the field, water flows and erosion problems, infiltration defects and excess water)
- Training planners and producers in contour development techniques

Technical itinerary

The contouring technique is applied to individual fields.
The development involves:

- In the dry season, stake out the plots to be developed from the high point of the field, using a topographical device known as an "optical level" (distance between lines of around 50 metres, varying according to the slope of the field).
- When the first rains come, build earthen bunds and dams 20 to 30 cm high along the contour lines, with a wide ditch upstream (about 1 m), using an ox-drawn plough or daba. In general, for low and medium slopes, it is usual to build 3 dykes/ados per hectare. The teenagers stay permanently
- All cultivation operations must follow the contour lines to encourage water retention and infiltration between the ridges, which remain open at the ends to direct excess water towards the natural drainage areas.
- Maintenance is necessary, as is grassing or planting with herbaceous perennials (e.g. *Andropogon gayanus*).

The role of the ados de niveau is not to retain all the water — which would require major earthworks — but to mark the direction of the sowing lines and ridges, which are thus all "level". The main effect of the layout is due to the retention of rainwater between the ridges.

Crops are grown on ridges that follow these contours: rainwater is retained between the ridges, where it infiltrates, and excess water runs off slowly at the ends of the field. This practice reduces the speed of run-off and encourages water infiltration.

Distances between contour lines, depending on the slope

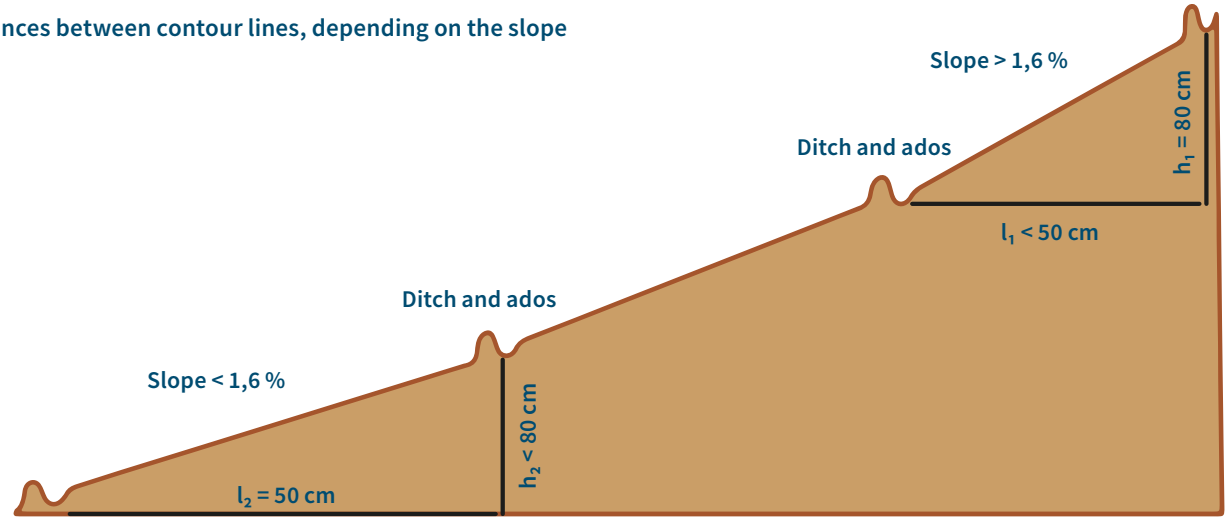
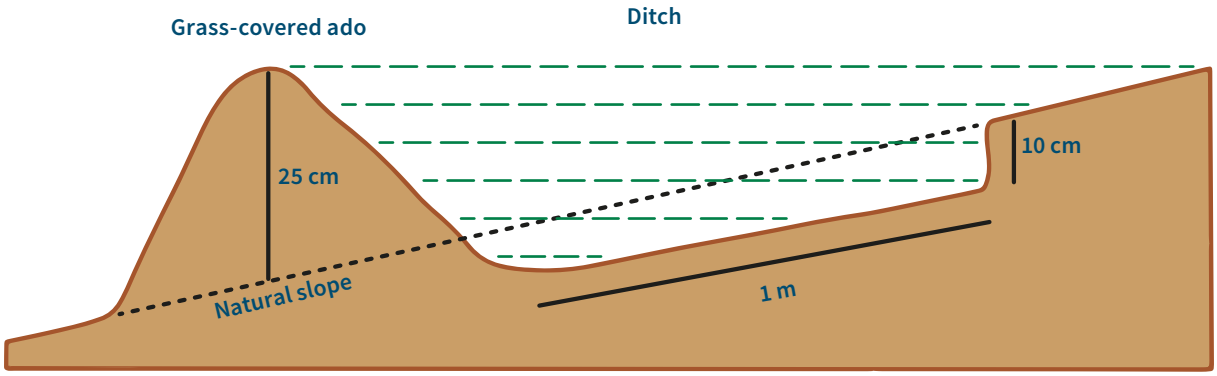


Diagram of a hand-made ditch and backfill for a contour line or diversion ditch



Resources mobilised

Natural resources: farmers' land and animals (plough oxen) for the option

Physical resources (materials and equipment): optical level and accessories; speaking staff (graduated ruler); plough or hoe/daba for making contour bunds

Human resources: technical agents or advisers (for technical training and the use of the optical level and the levelling staff to identify the contours); producers and collaborators and labour to build earth bunds following the contours (around 6 men/day/ha with the daba).

Social resources: cooperative

Estimated costs per hectare

For 1 ha of land to be developed as ACN, you need:

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of equipment and technical materials		**Cost of labour**	
Optical level (rental)	5,000	Staking per ha	5,000
Talking staff/ruler (hire)	5,000	Design ados with a hoe	5,000
Hoe (daba)	200	**Total estimated cost/ha**	**21,200**
Reinforcement with herbaceous species	1,000		

NB: with the mechanical option (cattle plough), you have to consider the plough (5,000/ha) and the animal at 50,000 (depreciated over 5 years) – 2 hours/ha needed to build the bunds.

Results obtained

Physical results

- 10% increase in soil infiltration
- An increase in yields for all crops of at least 10%, with maize more than doubling. As a result:
  - Seed cotton production rose from 1,133 kg/ha to 1,250 kg/ha
  - Maize production has risen from 1,243 kg/ha to 2,500 kg/ha
  - Sorghum production increased from 801 kg/ha to 1500 kg/ha
  - Millet production increased from 806 kg/ha to 1,500 kg/ha

Economic impact

- Increased income. Per hectare, the additional income is:
  - FCFA 29,250 for cotton
  - FCFA 226,260 for maize
  - FCFA 87,375 for sorghum
  - FCFA 135,330 for millet

Social impact

- Job creation for young people with the creation of EIGs of private service providers to carry out ACN work
- Young people who are now productive are moving to a more sedentary lifestyle, whereas before they left to work on more fertile land elsewhere in Mali (Office du Niger) or in neighbouring countries
- Improving the social status of women and young people who have appropriated the technology
- Better education for children as a result of improved income

Environmental impact

- More efficient use of water
- Recharge of groundwater due to improved infiltration
- Restoring the vegetation cover
- Improving the productivity of agroforestry species (*Vitellaria paradoxa*, *Parkia biglobosa*, *Acacia albida*, etc.)

Innovative aspects

- - New CES/DRS (Water and Soil Conservation and Soil Defence and Restoration) development method using a system of bunds reinforced with perennial herbaceous species (e.g. *Andropogon gayanus*)

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Hard work for farmers without ploughs and draught oxen	The use of private service providers (organised young people) by producers
Complex staking techniques	Intervention of a service provider or mastery of the technique by extension agents and farmers
Insufficient funds to purchase the “optical levels” and accessories needed to carry out the experiment	Recourse to the financial resources of cooperatives and “Ton” associations of which the producers are members

Potential for adoption

- A technique that can be easily integrated into all cultivation techniques
- Quick to carry out with oxen (2 hours/ha) and not very long with the daba (6 men/days per ha)

Challenges and prospects for scaling up

- Set up demonstration plots at growers’ sites (comparing fields with ACN with fields without ACN)
- Organise consultations between several farms: development at field level cannot solve all the problems, some issues need to be addressed at village level (organisation of water circulation, etc.)
- Encourage the emergence of private service providers to carry out ACN work
- Produce audiovisual productions aimed at the general public and political decision-makers
- Support efforts to disseminate the practice on a large scale, particularly among young people and women Equip groups of young people and women organised into cooperatives with technical equipment, particularly optical levelling equipment and accessories

Testimony

“On my land that has been developed using this technique […] I’m delighted with the increase in my production”

“My name is Bourama Goïta, from the village of Kiffosso 1 and a member of the ’Sènèyiriwaton’ cooperative in the commune of the same name. I have benefited from the contour development programme (ACN) set up by the NGO AMEDD

Up until then, we had managed our land with stone barriers, fascines and earth bunds without following the contour lines and often without even following the steepest slopes. These slopes were difficult, if not impossible, to recognise with the naked eye in the fields. We could see that erosion was washing away the topsoil from most of our fields, creating numerous gullies. The run-off water was also taking with it the mineral fertilisers applied to the fields, as well as the young plants, and often even the most vigorous ones. The soils in my fields settled and retained no moisture.

In search of a solution to maintain the moisture and fertility of our fields, we approached the project, which helped us to develop our land (recruiting agents responsible for topographical surveys, staking and monitoring the construction of the ditches/ados (earthen bunds), while we provided the labour for the construction and repair of the ditches/ados.

This experience has benefited me on several levels. I now have a better grasp of how to define the slope of my land, the various stages involved in building the ados according to the contour lines, the ploughing of the ados and the maintenance of the ados. I’ve also noticed that on my land that has been developed using this technique, moisture stays longer, run-off water is diverted into gullies or streams, and soil structure is improved by the increased presence of organic manure. Finally, I’m delighted with the increase in my production, whether it’s maize, cotton or millet, which means I can better cover my family’s food needs.”

To find out more

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https://www.ajol.info/index.php/ijbcs/article/view/189619

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https://beep.ird.fr/collect/upb/index/assoc/IDR-2013-DEM-EFF/IDR-2013-DEM-EFF.pdf

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BP4: Optimization of compost use on farms

Presentation of best practice

optimization of compost use

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Communes of Béréba, Bobo-Dioulasso, Dandé and Djigouèra (Hauts-Bassins region) in Burkina Faso and Prefectures of Haho, Moyen Mono, Est-Mono and Ogou (52 villages) in Togo	Sudanian and Sudano-Sahelian climate (Hauts-Bassins, Burkina Faso) and Sudanian climate (Central Region, Togo)	07/19 – 06/22 (Burkina Faso) 07/19 – 12/22 (Togo)

Optimising the use of compost involves applying it either at the time of sowing (directly into the seedbeds) or after sowing in a continuous line alongside the seedbeds, thereby using a smaller quantity of compost than would be the case with broadcasting it over the entire plot.

Type: Technical
Scale: Plot
Type of crops grown: All crops (cereals, vegetables and market garden produce)
Promoted by:

- consortium UPPA/H (Provincial Union of Agricultural Professionals of Houet); INERA (Institute for the Environment and Agricultural Research); CIRAD (Centre for International Cooperation in Agricultural Research for Development) and GCBF (Green Cross Burkina Faso), as part of the "Amélioration de la production et de l'efficience d'utilisation de la fumure organique dans les systèmes de production à l'Ouest du Burkina Faso (APEUFO)" project (RAAF/ECOWAS funding, with support from AFD); and
- consortium SEPT (Solidarity Consortium for the Development of Togolese Farmers): NGO CED (Centre for Ecology and Development), NGO CADI-Togo (Cooperation to support the integral development of Togo) and MAPTO (Organisation professionnelle agricole Mouvement alliance paysanne du Togo) as part of the "Promotion des exploitations familiales agroécologiques productrices du maïs et du soja pour des revenus durables dans la région des plateaux au Togo" project (PEFARD) (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

To cope with the continuing degradation of their land and the decline in soil fertility as a result of climate change and poor farming practices (inappropriate use of mineral fertilisers, pesticides and herbicides, monoculture, slash-and-burn farming, etc.), which significantly reduce crop yields, farmers in the Hauts-Bassins (Burkina Faso) and Plateaux-Est (central Togo) regions are turning to the use of organic matter. Unfortunately, in addition to the quality of the product, the compost produced is not always sufficient to cover the enormous needs of the cultivated areas. This is why, with the support of research institutions (e.g. INERA in Burkina Faso), the rational use of organic manure or compost has been experimented with and adopted (localised spreading on a continuous row or in bunches). The results in terms of crop development (maize and sorghum, for example) and yields are sometimes exceptional. This technique reduces the amount of compost wasted and gives more people access to it.

Problems the practice is intended to address

- Low levels of soil organic matter
- The inefficient use of the quantities of compost produced
- Limited access to organic matter

Objective:
- Improve crop yields (maize, sorghum, soya, cotton, etc.) through better timing and application of compost
- Reduce the excessive use of synthetic chemical inputs
- Giving small farmers access to high-quality organic matter

Beneficiaries: Rural producers
In Burkina Faso, 96 male and female farmers were involved in the project, spread over 4 communes in the Hauts-Bassins region (Béréba, 24; Bobo-Dioulasso, 32; Dandé, 16 and Djigouèra, 24).
In Togo, 1,977 producers, including 808 women organised into cooperatives, from 52 villages in the prefectures of Haho (11 villages), Moyen Mono (14 villages), Est Mono (13 villages) and Ogou (14 villages).

Implementers and roles

- **NGOs and associations (such as UPPA/H for APEUFO and CED for PEFARD):** coordination and mobilization of other players (partners and beneficiaries). The NGO AGIDE (Association for Integrated and Sustainable Management of the Environment) supplied biofertilisers and bi-controllers and trained producers in their use. It also trained producers in rapid production techniques
- **Research (INERA in Burkina Faso):** management of the technical aspects of the training and the implementation of tests on the efficient use of compost in a participatory manner with the beneficiaries. Similarly, the University of Kara, through LaCOSE (Organic Chemistry and Environmental Sciences Laboratory) provided training in compost analysis and composting
- **The Excellence cooperative and AGROFIS SARLU (Togo):** supply of certified seeds
- **Farmer trainers:** local technical support for cooperatives and carrying out all the activities listed in the Farmer Field School (FFS) booklet

Stages of implementation

Introduction to the practice

The implementation was preceded by participatory meetings which enabled a diagnosis of the problem to be made with the volunteer producers and the response to be identified with them.

Technical itinerary

APEUFO experiment (UPPA-Houet, Burkina Faso)
Application of compost in a continuous row after sowing

Compost making

Please refer to the best practice sheet entitled “Composting in tasks with a composting mixer”.

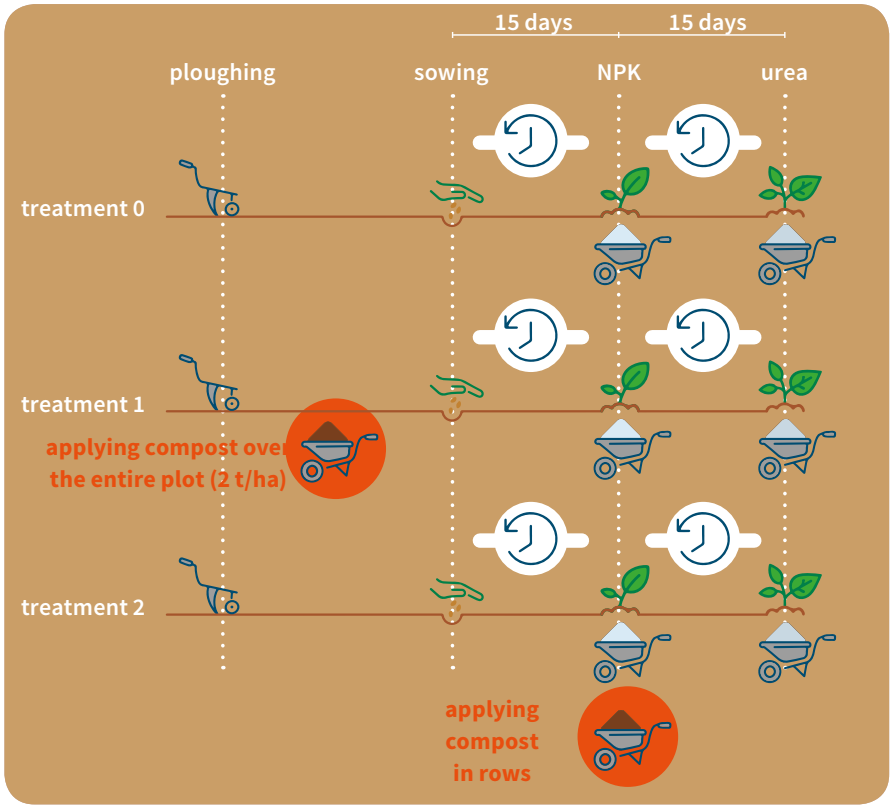
Using compost

A system was set up in a farming environment with two (02) crops per farmer. These two (02) crops, chosen in a participatory manner, were subjected to three (03) treatments.

The various treatments in the elementary plots are as follows:
- T0: NPK+ urea (recommended mineral doses)
- T1: Compost (2 t/ha applied to the entire area before sowing)+ NPK+ urea (recommended doses)
- T2: Compost (2 t/ha applied 15 days after sowing)+ NPK+ urea (recommended doses)

The manures used are as follows:
- NPKSB formulation
- Urea (46% N)
- Compost from a heap composting process based on crop residues enriched with phosphorus and potassium by Burkina phosphate and wood ash

Use of compost when sowing maize



Different methods of applying compost

How to proceed:
- Plough to a depth of 15 to 20 cm (for the 3 treatments)
- Evenly spread compost (2 t/ha) over the entire plot before sowing (for T1 only)
- Seed in accordance with the recommended crop spacing (for the 3 treatments)
- Apply NPKSB and cover at 15 DAS* (for the 3 treatments)
- Apply compost in a continuous line and cover (T2) at 15 DAS (for T2 only)
- Apply urea and cover at 30 days after application (for the 3 treatments)

* DAS: day after sowing

The following table gives the recommended doses of mineral fertiliser in the project area.

Seed and fertiliser application dates and rates for each crop

Crops	Seeds per hectare	NPK 15 DAS	Urea 30 DAS
Maize	20 kg	200 kg/ha	100 kg/ha
Sorghum	8–12 kg	100 kg/ha	75 kg/ha
Cowpeas	12 kg	100 kg/ha	sans apport
Soya	12–14 kg	100 kg/ha	sans apport
Cotton		150 kg/ha	50 kg/ha

Compost application session 15 JAS

PEFARD experiment (CED, Togo)
Application of compost in pots at sowing time

Making compost

1 *Mobilization of small equipment*

Plastic tarpaulins (4m² and 9m²), shovels with handles, cutters, rakes, forks, watering cans, wheelbarrows, pairs of gloves, plastic bags (50 or 100 kg), containers, buckets, etc.

2 *Waste collection and storage*

Two to three days before starting composting:
- Recover household waste (food scraps, crop residues, peelings, ash), green waste, poultry droppings, cow dung, bio accelerator (Mycotri)*

– Store in a dry place away from water and animals

* Mycotri: accelerates decomposition in composting, reducing composting time from 3 months to 2 months

3 *Preparing the waste and marking out the composting area*
– Using cutters, cut the waste into small pieces about 10 cm in size
– Mark out a flat area measuring 3 m by 2 m, if possible under a shed or tree, to be used for composting, and place a stake at each corner
– Pack the area lightly with a shovel
– Spread the 4 m^2 tarpaulin over the area and use wooden stakes to secure it to the ground.

4 *Putting the waste in piles or windrows*
– Use a wheelbarrow to transfer waste to the tarpaulin
– Build up successive layers approximately 20 to 30 cm thick, taking care to mix the waste according to the quantities available
– Sprinkle each layer with a small amount of compost collected from the undergrowth
– Water each layer evenly, but do not allow the water to run off heavily from the pile as it builds up
– Repeat this operation to form a round, cone-shaped pile (1.5 m in diameter and 1 to 1.5 m high)
– If the heap is not placed under a shed, use the 9 m^2 plastic sheeting to protect it from strong sunlight, rain and animals

5 *Turning and monitoring the windrows*
– The pile is turned over and reconstituted on the 2nd, 5th and 7th week
– Spread the 9 m^2 plastic sheeting next to the heap
– Using the fork, break up the heap and use the shovel to make small heaps on the 9 m^2 tarpaulin
– Reconstitute the windrow on the 4m^2 tarpaulin, taking care to place the waste from the upper layers at the bottom
– Water each layer lightly until the has been reconstituted
– Follow the decomposition process: this takes place 2 to 3 days after turning, by sticking a stick about 1.5 m long into the heap with its bark removed for 5 minutes. If it is warm and slightly damp, the process will proceed normally, but if it is cold and dry, you will need to turn it over again

6 *Maturation, recovery and storage of the compost*
– After the last inversion, allow the process to run its full course
– In general, mature compost is obtained after 2 months
– Compost is ripe when it takes on a greyish to blackish appearance
– Recover mature compost by removing undecomposed pieces
– Dry the compost in the shade for 3 to 4 days, then store it in bags in a dry, well-ventilated place

It should be noted that to obtain one (1) tonne of mature compost, three (3) tonnes of compostable waste must be mobilised.

Using compost

The project favoured localised input, which consists of closing the pits with compost (1 t/ha) at the time of sowing (the seeds are placed in the pits, which are closed only with compost).

Resources mobilised

Natural resources: organic inputs (animal manure, plant debris, household waste, Mycotri or Burkina phosphate); water; seeds

Physical resources: work equipment and materials (shredder or cutter, compost mould, plough, weeder, tarpaulins, wheelbarrows, shovels, rakes, forks, watering cans, machetes, buckets, watering cans, plastic bags)

Human resources: sufficient knowledge and know-how to carry out the technique (particularly fermentation); producers and trainers

Social resources: solidarity and mutual aid within the network of implementers; producer groups; equipment management committee

Estimated costs per hectare

The estimated costs of the practice per hectare are:

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
APEUFO experiment (compost application option: T2)		Treatment: 2 t/ha of compost in a continuous line at 15 DAS+ 200 kg NPK+ 100 kg urea	
Cost of equipment and technical materials		**Input costs**	
Shredder (hire from a service provider for the time needed to produce 2 tonnes of compost)	3,000	Petrol for the shredder (2 litres)	1,600
		Engine oil (contribution)	1,000
Tricycle fitted with polytank (amortised in 10 years)	130,000	Water (farm tariff)	4,000
Composting mould (amortised in 20 years)	10,000	Burkina phosphate (2.5 bags × 2,500 F)	6,250
Wheelbarrow (depreciated over 3 years)	12,500	Maize: 20 kg seed (20 × 600 F)	12,000
		200 kg NPK (200 × 575 F)	115,000
Black plastic film	5,000	100 kg urea (100 × 500 F)	50,000
Small items of equipment: machetes, forks, shovels, watering cans, etc. (depreciated over 3 years)	10,000	Sorghum: 8 kg seed (8 × 900 F)	5,600
		100 kg NPK (100 × 575 F)	57,500
		75 kg urea (75 × 500 F)	37,500
Cost of labour		Cowpea/soya: 12 kg seed (12 × 1,200 F)	144,000
		100 kg NPK (100 × 575 F)	57,500
		32 l biopesticides (16,000 F)	16,000
Compost preparation (waste collection, shredding, heaping, watering, turning, etc.) and application, field preparation, sowing, weeding, ploughing, harvesting, etc. (36 HJ × 2,500 F)	90,000	**Total estimated cost**	
		Maize	**450,350**
		Sorghum	**373,950**
		Cowpea/soya	**490,850**

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
PEFARD experience		Treatment: 1 tonne of compost per hectare per pot	
Cost of equipment and technical materials		**Input costs**	
FF rental	5,000	Water (farm tariff)	3,000
Cost of labour		Mycotri (4 boxes × 3,000 F)	12,000
Mobilization of 3 tonnes of compostable waste, preparation of waste and piling, turning, application + cultivation operations (42 HJ × 3,000 F)	126,000	Bags for compost storage (20 bags × 200 F)	4,000
		Maize seed (20 kg × 650 F)	13,000
		Total estimated cost (including cultivation)	**163,000**

Results obtained

Physical results

- In the commune of Djigouèra (in Burkina Faso), grain maize yields (SR 21) increased by 14%, soya by 58% (G 196) and sorghum (Kapelga) by 33%. These increases were also seen in Togo. They are around 2.4 times (for maize grown with compost) and around 3 times (for maize grown with compost and NPK) compared with maize grown without any application (see table below).
- More drought-resistant maize plants

Average yields (kg/ha):

Control plot (No compost or chemical fertilisers)	= 750
Plot with compost (1 t compost)	=1,800
Plot with chemical fertiliser (200 kg NPK)	=2,000
Plot with compost (500 kg) and fertiliser (100 kg)*	=2,200

* Compost and fertiliser used at half dose; (Source: CEA data for the 2020–2021 and 2021–2022 campaigns)

Economic impact

- Improvement in growers' incomes (by 20 to 25%) due to increased yields from the technology
- Compost savings of around 25–30% compared with conventional direct spreading
- Reduction in production costs (chemical fertilisers being more expensive than compost: 72,000 FCFA (4 bags of chemical fertiliser) for one hectare of maize compared with 66,000 FCFA (production cost of one tonne of compost) for one hectare of maize, i.e. a saving of 8.3% in production costs)
- Increase in turnover: for maize production using compost, turnover is 580,000 FCFA compared with 528,000 FCFA for production using chemical fertiliser, a gain of 9.85%
- Improved income for beneficiaries: by using compost for maize production, the income generated improves beneficiaries' portfolios (margins on maize have risen from an average of 307,000 CFA francs to 375,600 CFA francs per hectare)

Social impact

- Compost production is done in groups and helps to consolidate solidarity within the community (solidarity groups formed including women and young people)
- Compost production means extra work for the producer

Environmental impact

- Soil restoration (fertility and structure) due to the organic elements in the compost
- Maintenance and survival of soil micro-organisms (safeguarding biodiversity
- Improved quality of life (less air and water pollution caused by the excessive use of chemical inputs)
- The combination of compost and mineral fertilisers ensures efficient use of the mineral elements added and reduces nitrate losses through leaching, a source of pollution for groundwater and surface water

Innovative aspects

- Compost is used to close the seedpots when sowing, making nutrients immediately available to the young plants
- With less compost applied at the right time of year, crop yields are increased compared with farming practice

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Localised or in-furrow composting, which requires a little more time from growers	Consider mechanising local or furrow composting

Potential for adoption

- Easy technique, accessible to all and easily replicable in different contexts
- The practice of applying compost sensibly does not require any particular investment

Challenges and prospects for scaling up

- Increasing the number of demonstration tests outside the project's intervention sites to ensure greater visibility
- Support efforts to disseminate the practice on a large scale
- Promote functional cooperatives committed to making the production and sale (to members and non-members) of compost an income-generating activity (creation and equipping of production sites, production planning, packaging, storage and distribution of compost

Testimony

"With the localised application of compost 15 days after sowing, we practically doubled our production"

"My name is Mamadou Coulibaly, and I come from the village of Djigouèra in the province of Kénédougou. I'm a farmer and member of a group of agricultural producers. We produce maize, sorghum, cowpeas, sweet potatoes and cotton.

In recent years, we have seen a decline in the fertility of our soils, and chemical fertilisers, which used to be available on the market, have become very rare but also very expensive. We used to collect animal droppings and piles of rubbish from our concessions and spread them on our plots at the start of the winter season, before ploughing the fields.

In the past, those of us who produced compost applied it before ploughing, and the resulting maize yields varied from 0.9 to 1 tonne per hectare. With the APEUFO project (Improving the production and use efficiency of organic manure in production systems in western Burkina Faso), demonstrations in the field schools taught us about the effects of the different methods of applying compost on crops, which enabled us to choose to apply compost 15 days after sowing and in a localised manner. With the localised application of compost 15 days after sowing, we practically doubled our production. Similarly, whereas it used to take a lot of labour to produce compost, the shredder and composting mould solve this problem. The extra income I get from selling my surplus crops enables me to pay my children's school fees, and my wives have more time to devote to their income-generating activities.

Mamadou Coulibaly

These extraordinary results have convinced the members of our group, who no longer hesitate to mobilise the necessary inputs (crop residues, phosphate, water) to make compost. However, the difficulty lies in the scarcity of water sources and crop residues, which forces most growers to limit the areas they fertilise."

To find out more

Localised composting in Burkina Faso. UPPA Houet. 1'54".
https://youtu.be/7rFeqQU0GyA

Organic fertilisation. IECD. 3'46".
https://youtu.be/gCDZMNHjxEU

Scientific article published in the International Journal of Scientific and Management Research: "Perceptions et logiques d'appropriation de la pratique et de l'utilisation du compost dans les systèmes de production agricoles à l'Ouest du Burkina Faso". Dr Tionyélé FAYAMA. 15 p.
https://ijsmr.in/doc/ijsmr05_75.pdf

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BP5: Heap composting using a shredder and a composting mould

Presentation of best practice

heap composting

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Communes of Béréba, Bobo-Dioulasso, Dandé and Djigouèra (Hauts-Bassins region, Burkina Faso)	Sudanian and Sudano-Sahelian climate	12/19 – 06/22

Composting in a heap consists of piling up biodegradable waste (plant residues and animal excrement) in successive layers directly on the ground and allowing it to decompose by watering and turning.

Type: Technical
Scale: Farm
Type of crops grown: Cereals (maize, rice, sorghum) and tubers (manioc and sweet potato)

Promoted by: UPPA/H (Provincial Union of Agricultural Professionals of Houet); INERA (Institute for the Environment and Agricultural Research); CIRAD (Centre for International Cooperation in Agricultural Research for Development) and GCBF (Green Cross Burkina Faso), as part of the "Improving the production and use efficiency of organic manure in production systems in western Burkina Faso (APEUFO)" project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

In the Hauts-Bassins region of Burkina Faso, the potential for agricultural development is severely limited by the lack of soil nutrients and organic matter. In general, small-scale family farmers use household waste, bush straw and animal dung to amend their soils. But these amendments are rarely available in sufficient quantities. This is why farmers with the means to do so also use chemical fertilisers, which are very expensive and often unavailable.

The alternative solution proposed by UPPA/H and its partners, through the APEUFO project, is to use composting as a source of organic manure by recycling crop residues and manure. Compost plays an important role in maintaining soil fertility. As well as making more efficient use of chemical fertilisers, it gives the soil good physical, chemical and biological properties.

Composting is an ancient practice that has been much improved in Burkina Faso by research structures such as INERA and numerous projects and NGOs. It has been popularised on a large scale through the pit production technique by the Burkina Faso Ministry of Agriculture since 2001 through the "Fosses fumières" operation. The pit composting technique, which has its limitations (difficulty of digging and stabilisation), has been replaced by heap composting, which has been adopted as part of the APEUFO project.

Problems the practice is intended to address

- Low soil organic matter content
- The physico-chemical degradation of soils (low water retention capacity, low cation exchange capacity, etc.)
- Loss of biodiversity (soil micro-organisms) and reduced biological activity
- The low quantity and quality of traditional organic soil improvers
- The dependence of some growers on expensive chemical fertilisers that are difficult to access
- Falling agricultural yields

Objective: To significantly increase the quantity and quality of compost produced, in order to efficiently restore soil fertility and make the most of harvest residues

Beneficiaries: Rural producers
In 5 months, the APEUFO project trained 478 producers (52% of whom were young people and 30% women) and 10 advisory support staff in the production of compost in heaps

Implementers and roles

- **Producers and producer organisations (UPPA/H in the case of the APEUFO project):** group purchase/rental of equipment, facilitation of training and implementation of the practice
- **Research or extension structure (INERA in the case of the APEUFO project):** conducting the technical aspects of training and testing in a participatory manner with the beneficiaries

Stages of implementation

Introduction to the practice

The beneficiary producers were chosen on a voluntary basis following awareness-raising sessions on the technology organised by UPPA/H officials. These training sessions, given by 2 technicians, were given in clusters (groups of producers with a certain proximity) for 10 days, i.e. a total of 20 HJ.

Technical itinerary, for 800–850 kg of compost

1 Choosing the composting area

The site should be close to a source of sufficient water to facilitate repeated watering while the compost heap is being assembled. The heaps should be shaded to prevent water loss through evaporation.

2 Shredding harvest residues and marking out the composting area

- Bring crop residues, manure and water to the composting area using a tricycle equipped with a polytank (water transport tank)
- Shred 1 tonne of harvest residues into pieces approximately 5 to 10 cm long using a shredder
- Assemble the iron mould (L = 2 m × W = 1.50 m × H = 1.20 m), i.e. 3.6 m² under shade

3 Setting up the compost heap

- Cover the soil inside the mould with fresh leaves and water lightly so that the leaves settle to the ground
- Fill the inside of the mould with shredded residue and tamp down to a depth of around 30 cm
- Then add a 5 cm layer of well-crushed manure (or 250 g of "Compost Plus" as an activator if manure is not available)* over the entire surface of the heap
- Dilute about 15 kg of Burkina phosphate (rock phosphate powder) with about 15 to 20 litres of water and apply to the entire surface of the heap
- Dilute about 2 kg of wood ash with about 10 litres of water and apply to the entire surface of the heap
- Water the layer sufficiently, using circular movements, until the water begins to run down the sides of the mould (the quantity of water can range from 200 to 300 litres per layer; it all depends on the type of residue and its degree of humidity: the finer the shredding, the more water will be used)
- Repeat the process (mulch, manure, Burkina phosphate,

Composting mould

wood ash), overlapping layers to a height of 1 or 1.20 metres, insisting on watering
– Cover the last layer of the heap with a thin layer of shredded residue

* If no compost is available, you can use the "Compost plus" activator (250 g instead of the 5 cm layer of manure).

For approximately 800 to 850 kg of compost, you need about:
– 1 tonne of crushed residues
– 50 kg of Burkina phosphate
– 200 kg of well-crushed manure (more can be used) or 250 g of "Compost Plus"
– 20 kg wood ash

4 **Closing the pile**

Remove the mould and cover the heap with black plastic film to conserve moisture and heat. It will also prevent animals from rummaging around in the heap in search of food.

5 **Watering and turning the heap**
– Check the decomposition process every week using the stick technique*
– Every 14 days, remove the plastic film and turn the heap over
– After each turning, water thoroughly and cover the heap again

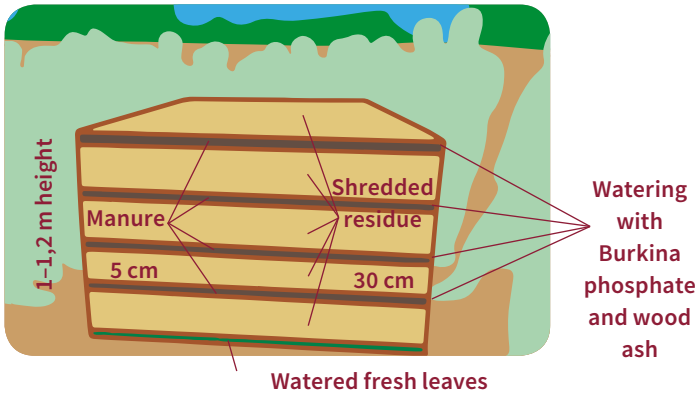
* How can we control the decomposition process (humidity and temperature)?
– Use a stick about 1.5 m long stripped of its bark
– Push the stick to one side for 10 minutes, remove the stick and touch it:
  · If it is hot: the process is normal
  · If it is cold and dry: add water
  · If it's cold and damp: start compacting again

6 **Compost maturity and conditioning**

In general, mature compost is obtained after 2 to 3 months of composting, depending on the substrates and the production conditions. Compost is ripe when the temperature drops, despite the humidity, and takes on a greyish to blackish appearance with no unpleasant odours. The compost should then be dried in the shade for 3 to 4 days, then stored in sacks in a dry, well-ventilated place until it can be used in the field.

NB:
– Burkina phosphate (BP) is a natural phosphate amendment extracted at Kotchari in Burkina Faso. It consists of phosphorus pentoxide P_2O_5 at over 25% and calcium oxide CAO at over 35%. It is produced by Société d'Exploitation des Phosphates du Burkina (SEPB).
– "Compost Plus" activator is a thermophilic strain of bacteria (*Bacillus farraginis*) in granular form which, when brought into contact with organic matter in moist conditions, accelerates its decomposition to produce compost

Diagram of the compost heap after assembly



Resources mobilised

Natural resources: crop residues available on production plots; manure from poultry, small ruminants or cattle; water; wood ash; Burkina phosphate

Physical resources: equipment (shredder, tricycle equipped with polytank); technical equipment (composting mould, machetes, forks, wheelbarrows, shovels, watering cans, black plastic film)

Human resources: sufficient knowledge and know-how to carry out the technique (particularly fermentation); producers and trainers; implementation of the practice requires around 8 man-days (grinding, collecting water, assembling the heap, turning over, etc.)

Social resources: producers' group; equipment management committee

Estimated costs per hectare

The estimated costs of 2 tonnes of compost for 1 ha (quantities recommended in Burkina Faso for one application per year in a plot) are:

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of equipment and technical materials		**Input costs**	
Shredder (hire from a service provider for the time needed to produce 2 tonnes of compost)*	3,000	Petrol for the shredder (2 litres)	1,600
Tricycle fitted with polytank (amortised in 10 years)	130,000	Engine oil (contribution)	1,000
Composting mould (amortised in 20 years)	10,000	Water (farm tariff)	4,000
Wheelbarrow (depreciated over 3 years)	12,500	Crop residues and manure	N/A **
Machetes, forks, shovels, watering can (depreciated over 3 years)	10,000	Wood ash	N/A **
Black plastic film	5,000	Burkina phosphate (2.5 bags × 2,500)	6,250
		Cost of labour	
		Shredding, water collection, heap assembly, turning, etc. (8 h/d) (2,500 × 8)	20,000
		Total estimated cost	**203,350**

* The purchase cost of the shredder is estimated at FCFA 2,100,000.
** Available on the farm.

One of the beneficiary producers and a shredder

Results obtained

Physical results

- High-quality, mature compost in large quantities within 3 months
- Increased crop yields. Combined with mineral fertiliser (NPK + urea) at a rate of 2 t/ha per plot 15 days after sowing, the application of compost can increase maize yields by 50 to 100% compared with production using mineral fertiliser alone, without the addition of compost (APEUFO project: insert link to fact sheet on the efficient use of compost)

Economic impact

- Making use of locally available harvest residues (APEUFO project: cotton stalks were previously little used and generally burnt)
- Points to watch:
  - Take care not to compete with animal feed that uses agricultural residues
  - Do not remove all the harvest residues and leave the soil bare (raise awareness of the importance of soil cover, reintegrating organic matter, etc.)
- Reduced costs associated with the purchase of chemical fertilisers
- Increased farm income due to higher yields and the sale of surplus production

Social impact

- Use of young contractors for transport (harvest residues, water) and shredding of harvest residues with shredders
- Less arduous work (easier and quicker than the old in-pit composting method) and therefore more accessible to women

Environmental impact

- Improving biodiversity and soil fertility
- Reduced use of chemical fertilisers

Innovative aspects

- Use of a high-capacity shredder for harvest residues instead of cutting them by hand using a machete
- Use of a composting mould for greater compaction capacity and quicker assembly of the compost heap
- Use of a tricycle to transport the shredder, water (polytank) and harvest residues to the composting area

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Lack of water for making compost: The technique is mainly used at harvest time, i.e. at the end of the rainy season, from November to April. During this period, many water sources dry up or come under great pressure from people looking for water for domestic consumption	Compost just after the harvest, when there is still water in many reservoirs (October-November-December)
Unavailability of Burkina phosphate	Express the need to encourage increased marketing by the Burkina Faso government from these national deposits
A large workforce	Use young people to collect water and harvest residues, shred, turn the heap, etc.

Potential for adoption

- Easy pile assembly technique, accessible to all and easily replicable in different contexts
- Less restrictive than composting in pits
- Can be made using various types of locally available organic matter
- Possibility of selling surplus compost production

Challenges and prospects for scaling up

- Support efforts to disseminate the practice on a large scale
- Facilitating access to credit for producers and producer organisations for the purchase of the necessary equipment (shredder, composting mould, water polytank and tricycle for transporting residues and water)
- Increasing the marketing of Burkina phosphate

Testimony

"Thanks to heap composting, my production and income have increased"

"My name is Daouda Traoré. I'm the village chief of Kassanga and one of the leaders of the Djigouèra group. I grow cereals (maize, rice and sorghum) and tubers (cassava and sweet potatoes), and I have a citrus and mango plantation.

Mineral fertiliser had become unaffordable, both in terms of price and because it was scarce on the market, so to fertilise my fields I collected and spread piles of household rubbish and animal dung in my fields before ploughing at the start of the season.

With the support of the APEUFO project, and thanks to the mobilization of my wives, children and even neighbours, I am now producing compost to fertilise an area of around one hectare. I've noticed a marked increase in my crop yields. My farm income has increased and I'm better able to pay my children's school fees, while my wives have more financial resources for their small businesses. For the moment, we don't market our compost, but this could be one of our medium-term ambitions if we manage to have surpluses. With this in mind, our group will have to work on increasing the amount of equipment (shredders, composting moulds, tricycles with poly-tanks, etc.). For the moment, my short-term ambition is to produce enough compost to cover at least two hectares.

One of the difficulties that I and my comrades in the group are facing is the unavailability of Burkina phosphate on the market."

To find out more

Heap composting. CIRAD and Union Nationale des Producteurs de Coton du Bénin (UNPCB). 7 p.
https://coton-innovation.cirad.fr/content/download/5107/36932/file/ITKInnovation-19-Burkina%20Faso%20Compostage%20en%20tas.pdf

Dissemination of a compost activator among farmers in Burkina Faso. Wendkouni Mireille Yameogo, JIPAD 2021. 4'50''.
https://www.chaireunesco-adm.com/Wendkouni-Mireille-Yameogo

Heap composting technique with the addition of Burkina Phosphate and compost plus activator. Ministry of Agriculture and Hydro-Agricultural Development (MAAH) of Burkina Faso. 5'39''.
https://www.agriculture.bf/jcms/pp_102077/fr/technique-de-compostage-en-tas-avec-adjonction-du-burkina-phosphate-et-de-l-activeur-compost-plus

Heap composting in Burkina Faso. UPPA Houet. 2'31".
https://youtu.be/bmzfoqbXULY

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BP6: Bokashi to boost the fertility of cultivated land effectively and sustainably

Presentation of best practice

bokashi

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Tapoa Province (Eastern Region, Burkina Faso)	Sudano-Sahelian climate	07/19 – 06/22

In Japanese, bokashi is compost made from organic matter fermented in the soil and ready to use after a fortnight.

Type: Technical
Scale: Farm
Type of crops grown: Cereal crops (sorghum, millet, maize, rice), vegetables and fruits

Promoted by: ACF (Action contre la faim); UPPA (Provincial Union of Agricultural Professionals of Tapoa); Association BEO-NEERE; CREAF/INERA (Environmental Research and Training Centre of the Institute for the Environment and Agricultural Research) , as part of the "Projet d'appui à la transition agroécologique dans la région de l'Est du Burkina Faso (PATEB)" (financed by RAAF/ECOWAS, with support from AFD)

Context of the experience

In the province of Tapoa in Burkina Faso, cereal crops, which are not very intensive, perform poorly due to low soil productivity. In fact, the soil receives low-quality organic manure, including raw animal waste. In addition to the low level of organic matter in the soil, soils are subject to the degrading effects of synthetic chemical products (fertilisers, pesticides, herbicides). It was against this backdrop that the PATEB project introduced bokashi to the area as a way of producing better quality organic matter to enable farmers to improve soil fertility and yields on their farms.

Problems the practice is intended to address

- Decline in soil fertility and agricultural yields
- The difficulty and time involved in making traditional compost
- The low quantity and quality of traditional organic soil improvers

Objective:
- Making the most of farm waste (crop residues, household waste, animal dung, weeds, etc.)
- Increase soil fertility on the farm
- Increase the farm's productivity and consequently its agricultural output

Beneficiaries: rural producers cereal growers, market gardeners and citrus growers
The direct beneficiaries of the PATEB project are a total of 2,017 direct producers of all working ages

Implementers and roles

- **Development NGO (Action Contre la Faim for the PATEB project):** mobilising financial resources and monitoring the implementation of the experiment
- **Development associations or producer organisations (BEO NEERE and UPPA-Tapoa in this case):** mobilising and training endogenous facilitators and producers in organic matter composting technologies and advisory support
- **Agricultural research (INERA in this case):** producing evidence from experience through the collection and analysis of soil and plant samples and agronomic trials. Its role ends when the technology has been tried and tested and validated definitively.

Stages of implementation

Introduction to the practice

- Identification of the intervention area (with problems of declining soil fertility)
- Information and awareness-raising meeting for producers
- Planning training courses and bokashi production activities
- Training of endogenous facilitators (2HJ) by technicians
- Collective practical training for producers by endogenous facilitators (30 HJ)
- Support and advice from UPPA-H endogenous coordinators (65 HJ)

Technical itinerary

The composting method used is anaerobic composting, which involves assembling different materials (soft straw, rice bran, powdered charcoal, termite mound soil, ash and traditional yeast mixed with sweet juice) into a heap and composting them over 14 days.

1 **Manufacture (To be done in the shade)**

Dissolve 1kg of brown sugar and 1kg of traditional yeast in 30 litres of water. This solution will be used to gradually moisten the other ingredients.

The different stages of the first level are:

- Spread a wheelbarrowful of manure evenly over the ground
- Put a wheelbarrowful of termite mound soil on top of the manure
- Put in a wheelbarrow of soft straw
- Put in a scramble of bran
- Put a layer of 2 kg of coal powder
- Apply a 2 kg layer of wood ash

End of the first layer. Each time, thoroughly wet each layer with the water solution containing the sugar and yeast.

Do the same for the second level, then the third.

2 NB: the following alternatives can be used:

- Molasses instead of brown sugar
- Rice husks instead of soft straw
- Corn bran instead of rice bran
- Clay instead of termite mound soil

Turnovers (mixes)

- At the end of the 3rd level, mix everything together to obtain a perfect blend
- Then cover the heap with straw or seccos, which must be kept in the shade
- Mix this mounted manure the same evening, then the following morning and evening until the fourth day
- After the fourth day, turn over once a day for 11 days

The resulting bokashi manure is ready to use after 14th days.

It can be dried and stored in bags for use at the appropriate time.

Resources mobilised

Natural resources: inputs (soft straw, rice bran, powdered charcoal, termite mound soil, wood ash, yeast, brown sugar, park manure, water

Physical resources: equipment (wheelbarrow, shovels, forks, pickaxe, rakes, machete, basin, weighing scales and a watering can)

Human resources: 1 person for 14 days (for 1 tonne of bokashi)

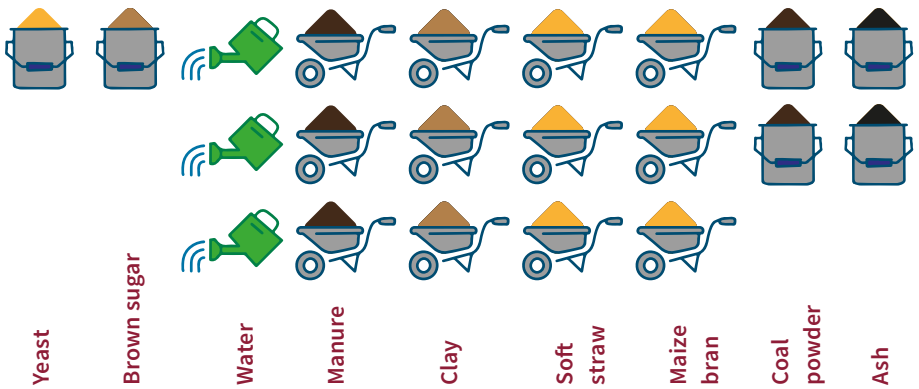
Social resources: producer networks

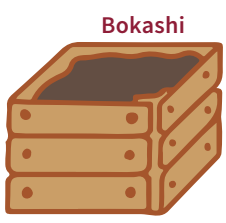
Bokashi manure heap covered with a tarpaulin to ensure the anaerobic nature of the process

Estimated costs per hectare

Cost category	Cost (FCFA)
Cost of equipment and technical materials	
Wheelbarrow (1) Shovels (2) Rakes Forks (2) Pickaxe (1) Machete (1) Bassine (1) Watering can (1) Peson (1)	75,000

Cost category	Cost (FCFA)
Input costs	
Traditional yeast – dolotière (1 kg) Water (30 litres) Cow manure (3 wheelbarrows) Brown sugar or molasses (1 kg) Termite mound soil or clay (3 wheelbarrows) Soft straw or rice husks (3 wheelbarrows) Rice or maize bran (3 wheelbarrows) Coal powder (2 kg) Wood ash (2 kg)	20,000
Cost of labour	
Input transport, preparation, turning (1,000 FCFA/day)	14,000
Total estimated cost	**109,000**





Matériaux nécessaires et produit final au bout de 15 jours

Results obtained

Physical results

- Obtaining quality compost over a short period of time
- Increased sorghum (10%) and maize (22–28%) yields

Social impact

- Job creation for young people to transport inputs, prepare and turn bokashi

Economic impact

- Increased income as a result of higher sorghum and maize yields
- Recovery of farm waste

Environmental impact

- Improving soil fertility
- Limiting the use of synthetic chemicals that pollute the soil

Innovative aspects

- Rapid composting method (14 days) unlike traditional compost produced in a pit, which requires 3 months of hard, diligent work

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
The difficulty of disposing of yard manure for producers who have no animals	Keeping an eye on places where animals are present (pastures, watering places, resting places) to collect dung.
The inability of some producers to have access to the minimum equipment (wheelbarrows in particular) and certain inputs (sugar and yeast)	Setting up a system of equipment loans between producers

Potential for adoption

- Easy-to-use technology
- Most of the raw materials are locally available and inexpensive (with the exception of yeast and sugar/molasses
- Inexpensive equipment
- Easy-to-adapt technique

82.7% of households reported using biofertilisers for soil fertilisation at the end of the PATEB project (endline survey), compared with 41.2% at the start of the project (baseline survey).

Challenges and prospects for scaling up

- Support efforts to disseminate the practice on a large scale
- Facilitate access to credit in order to obtain input collection/transport kits (manure, dung, straw, water, etc.) and initial supplies of inputs, particularly sugar and yeast.

To find out more

Bokashi, the organic fertilizer that brings the earth back to life, a film about the experience of the NGO RAFIA in the Savanes region of northern Togo. ECOWAS. 4'42".
https://www.youtube.com/watch?v=9qObkuw-jzdE&t=158s

Making Bokashi (fermented organic matter) in Benin. AFDI. 8'23".
https://www.youtube.com/watch?v=l8byvKbhox4

Bokashi production in Burkina Faso. NGO RAFIA. 4'42".
https://youtu.be/2b_mSEbcIqs

Bokashi enriches the plant and improves the soil (NGO Inades Formation). Agridigitale TV. 26'.
https://www.youtube.com/watch?v=EJtzDaGu6Dg

How to make 100% natural compost. SoyCain. 3'32''.
https://www.youtube.com/watch?v=Ncwp6-LwFeY

Burkina Faso: Fertilising the soil with bokashi. Agribusiness TV. 11'18''.
https://www.youtube.com/watch?v=HsZsJU-NdVs

Anaerobic production of Bokashi from rice bran and husk and poultry litter. Houenou A. C. E., Amonmide I., Koura T. W., Mensah A. C. G., Assogba Komlan F., Dagbenonbakin G. D., 2021. 12 p.
https://www.researchgate.net/publication/354535760_Production_anaerobique_de_Bokashi_a_base_du_son_et_balle_de_riz_et_de_la_litiere_de_volaille

Study of the effectiveness of bokashis, compost and biopesticide solution promoted by the Songhaï Centre to improve lettuce and amaranth production in Southern Benin, Liège University, Gembloux Agro-Bio Tech, Academic Year 2018–2019. Houenou A. C. E., 2019. 104 p.
https://www.researchgate.net/publication/339004034_Etude_de_l'efficacite_des_bokashis_du_compost_et_de_la_solution_de_biopesticide_promus_par_le_centre_Songhai_pour_ameliorer_la_production_de_la_laitue_et_de_l'amarante_au_Sud_du_Benin

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BP7: Compost pits to produce improved compost

Presentation of best practice

compost pits

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Departments of Nioro and Kaolack (Kaolack region), Mbirkelane and Kaffrine (Kaffrine region), Senegal	North Sudan continental climate	07/19 – 06/22

The production of compost and improved manure using the 3-pit process is a 5-phase technique that produces large quantities of compost and manure. By the 45th day after the first pit is filled, the compost in the third pit is ready for use.

Type: Technical
Scale: Farm
Type of crops grown: All crops
Promoted by: ASPRODEB (Senegalese Association for the Promotion of Grassroots Development), ISRA (Senegalese Institute for Agricultural Research), CCPA (Peanut Producers' Consultation Framework), PEFROMAS (Federation of Saloum Maize Producers), RNCPS (National Network of Seed Production Cooperatives), FONGS/AP (National Federation of Non-Governmental Organisations of Senegal / Action Paysanne), FONGS/ADAK (Association of Farmers in the Kaolack region), FONGS/EGABI (Entente des groupements associés de Birkelane) as part of the Support for the Resilience of Agropastoral Family Farms to the Effects of Climate Change (PAREFA) project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

Senegal's groundnut basin is facing a reduction in the productive capacity of cultivated soils due to anthropogenic factors, such as failure to comply with good farming practices (fallowing, crop rotation, maintenance of plant cover, return of crop residues, etc.) and the harmful effects of climate change (water and wind erosion, destruction of soil organic potential, deforestation, etc.). Several agroecological technologies and practices, including composting and the use of improved manure, are appropriate responses to the decline in soil fertility. Indeed, these practices generally have a high to medium impact on improving the productivity of almost all crops (groundnuts, cereals, horticultural crops, etc.). It was for this reason that the PAREFA project initiated and implemented compost pits for family farms in the Kaolack and Kaffrine regions.

Compost pit built in Thiak, filled and protected to accelerate maturation

Problems the practice is intended to address

- The decline in the fertility of cultivated soils
- Low water retention in the soil
- Soil carbon poverty
- The decline in agricultural productivity

Objective: scale up the production of improved compost to restore the fertility of cultivated soils and thus increase agricultural productivity

Beneficiaries: Rural producers
The direct targets of the PAREFA experiment are family farms (EXFAM) that are members of FBOs and grassroots producers' organisations affiliated to ASPRODEB. In all, 100 family farms (EXFAM) each have a compost pit or manure pit, the construction of which is fully subsidised by PAREFA

Implementers and roles

- **NGOs (such as ASPRODEB for PAREFA):** technical, administrative and financial management of the project
- **Producers' umbrella organisations (OPF):** identification of beneficiary EXFAMs who will carry out the activities in the field
- **The technical support system (focal point technician and facilitator) set up by the FPOs:** support for the implementation of the activity

Stages of implementation

Introduction to the practice

Information and awareness-raising meetings enabled ASPRODEB and its regional relays to select the beneficiary farms on the basis of a number of criteria: (i) they must have sufficient quantities of raw material (millet straw, millet stalks, maize, ash, organic matter) to ensure that the pit is filled twice a year; (ii) they must have sufficient manpower (a minimum of 5 workers in the EXFAM) for turning, collecting, packaging and spreading in the fields; (iii) they must have easy access to water to ensure that the compost matures properly.

Technical itinerary for the production of improved compost

The composting process takes place in five (05) phases:

1 Preparing the pits or caissons/bins

Build 3 twin boxes 2 m long, 2 m wide and 1.5 m high, giving a volume of 2 m × 2 m × 1,5 m × 3 compartments = 18 m^3

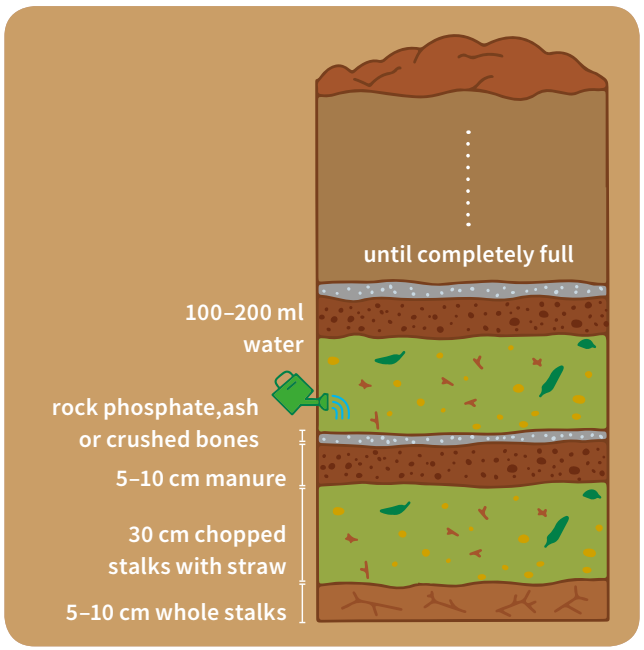
- The dimensions of the boxes or bins vary according to the availability of the raw material
- Use industrial cement with iron posts for added strength and durability
- Local materials can be used (building clay, cut stone, breeze blocks, etc.), but they are less solid and less durable

NB: this model of composting pits in a box and in height was adopted by consensus for the beneficiary EXFAMs and the technical system.

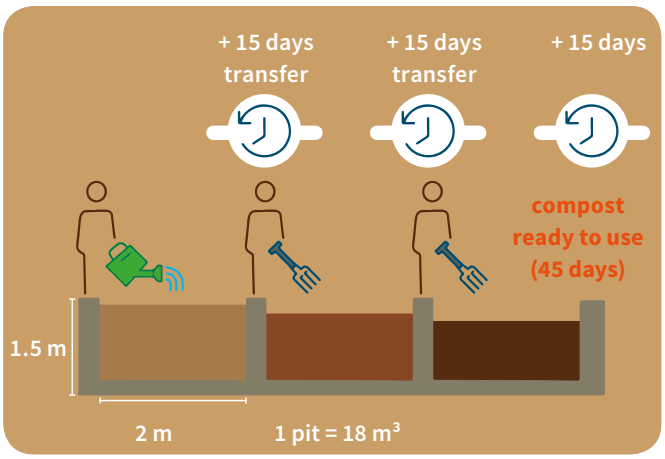
2 Filling the pits or caissons/bins

1. Place a layer of unchopped typha, millet, maize or sorghum stalks 5 to 15 cm deep to help aerate the bottom
2. Then add a 30 cm layer of plant matter made up of chopped stalks (typha, millet, maize, groundnut hulls, millet soot) mixed with straw
3. Trampling the heap
4. Apply a 5 to 10 cm layer of manure
5. Apply a thin layer of rock phosphate/ash/bones
6. Water with 100–200 l of water
7. Repeat the process from step 2 until the pit is completely full

Filling the pits



Transfer from one pit to another



3 Composting process

Transfer from one pit to another; compost obtained after 45 days

1. Leave to decompose for 15 days
2. Transfer the contents of the first pit to the second pit
3. Water at a rate of 80 to 100 litres per week
4. Repeat the same filling process for the first pit
5. After a further 15 days (30th day after the first pit was filled), return the contents of each pit to the next, still watering
6. Refill the first pit

4 Maturation of the compost

- Composting time in 3 pits or bins
  At the end of the 45th day after the first pit was filled, the compost from the third pit is ready for use
- Compost maturity
  To recognise mature compost, 3 indicators come into play:
  1. The colour of compost
  2. The smell of compost
  3. The consistency of compost

  When it is ripe, compost has a brown colour, a damp earthy smell and a crumbly consistency

5 Terms of use

- Mode of application
  There are 4 ways of doing this:
  1. Spreading compost before ploughing
  2. Incorporate a thin layer of compost into the top 10 cm of soil when ploughing
  3. Apply compost in the furrows before sowing or transplanting
  4. Put it in pots
- Dosage
  For optimum application, an average of 5 to 10 tonnes of compost per hectare is required, depending on the quality of the compost

Resources mobilised

Natural resources: livestock manure; crop residues (typha stalks, millet, maize, sorghum, groundnut hulls, millet soot); ash and aerial biomass from trees (e.g. neem); water; pit construction materials (industrial cement, sand and iron posts or local materials: building clay, cut stone, breeze blocks, etc.)

Physical resources: basins; shovels; wheelbarrows; rakes; forks; compost pits

Human resources: sufficient knowledge and know-how to carry out the technique; members of the operator's family (12 HJ)

Social resources: OPF

Estimated costs per hectare

The cost of making 5 tonnes of compost, including making the pits, is estimated as follows (for 1 hectare of crops):

Cost category	Cost (FCFA)
Cost of equipment and technical materials	
Construction of caisson pits (3 compartments side by side: 6 m × 2 m × 1.5 = 18 m^3)	85,000
Wheelbarrows (depreciated over 5 years)	9,000
Other (basins, shovels, forks, rakes, etc.) (depreciated over 5 years)	3,000

Cost category	Cost (FCFA)
Input costs	
Water	8,000
Harvest residues and above-ground biomass	11,500
Natural phosphate	8,000
Manure	6,000
Cost of labour	
Creation of pits, preparation of compost/improved manure, turning, application (14 HJ × 3,100 FCFA)	43,400
Total estimated cost	**173,900**

Results obtained

Physical results

- Obtaining mature, high-quality compost in large quantities
- Improved productivity in fertilised plots. For example, a farmer in the village of Moukoumé who has managed to fertilise his 3 ha of millet correctly has obtained yields of 1.5 tonnes/ha, compared with 0.8 tonnes/ha for the reference, representing an 88% increase in production

Economic impact

- Reduction in the use of mineral fertilisers, the cost of which has risen sharply
- Increase income by selling surplus production
- Making the most of locally available harvest residues

Social impact

- Better coverage of household food needs, as a result of increased production

Environmental impact

- Improving biodiversity and soil fertility
- Reduced use of chemical fertilisers

Innovative aspects

- A compost bin with 3 pits or bins for easy turning of the material throughout the cycle. What's more, it ensures continuous production of compost to fertilise more farmland.

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
The capacity of producers to have the equipment they need to produce inputs	A subsidy policy for access to facilities could be introduced
Requires large quantities of water, which can quickly become a constraint, especially in the Sudano-Sahelian zone	Community boreholes could be built to help overcome the water constraint
Requires a large workforce	Mechanisation of certain operations (e.g. transport) could relieve the burden on operators

Potential for adoption

- Easy-to-use technique that does not require a high level of technical expertise
- Can be made using various types of locally available organic matter
- Possibility of selling surplus compost production

Challenges and prospects for scaling up

- Support efforts to disseminate the practice on a large scale
- Facilitating access to credit for producers and producer organisations for the purchase of equipment needed to build compost pits and manure storages (total or partial subsidy of work equipment)
- Drilling boreholes to improve access to water

To find out more

Fiche technique: Successful composting in pits in an integrated system (crop/livestock) in the environment of shea parks in northern Côte d'Ivoire. Journal of Applied Biosciences 148. 9 p.
https://m.elewa.org/Journals/wp-content/uploads/2020/04/10.Alui_-1.pdf

How to use local materials to build the walls of a manure pit. CILSS. 23 p.
http://portails.cilss.bf:8500/documents/5599.pdf

Experimenting with and for farmers: lessons learned from co-designing innovations for organic manure production in Tuy province, Burkina Faso. Vall E., Andrieu N., Chia E., Nacro H. B. Hal,13 p.
https://hal.science/hal-00719728/document

Manure pit, treasure pit (Dédougou, Burkina Faso). UGCPA. 8'16".

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BP8: Localized weeding in cereal farming in the Sahel to optimise labour use

Presentation of best practice

localized weeding

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Village of Guiè (pilot farm), rural commune of Dapélogo (Central Plateau region, Burkina Faso)	Sahelo-Sudanian climate	07/19 – 06/22

Localised weeding is a technique that consists of manually hoeing only a 20–25 cm radius around cereal seedlings at the emergence stage.

Type: Technical
Scale: Plot

Type of crops grown: Cereals (millet, sorghum, maize)
Promoted by: Terre Verte (TV), GRET (Technological Research and Exchange Group), IRD (Development Research Institute), La Trame, AZN (Zoramb Naagtaaba Association), as part of the "Sharing the Sahelian Bocage (BSP)" project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

In Burkina Faso and most other Sahelian countries, cultivation work is largely carried out by hand, from clearing or preparing the field to sowing, weeding and harvesting.

Weeding is by far the most arduous of these operations, not only because of the physical effort required on soil that is sometimes hardened between rains, but also because it is often carried out in a hurry. The work has to be done quickly, because rain can come at any time, interrupting the work for several days while the weeds continue to grow.

As a result, many Sahelian farmers sow cereal crops that they find difficult to weed completely.

In response to this restrictive situation, the BSP Project has developed the "localised weeding" technique, a practice that reduces labour effort while speeding up the process, without compromising expected production. This approach is inspired by the Zaï technique, which localises water and fertiliser at the foot of the plants.

Localised weeding of sorghum

Problems the practice is intended to address

- The hardship and loss of time associated with weeding large areas under sowing
- The need to prepare future fallow land
- Soil degradation

Objective:
- Reduce the arduous nature of farm work, in this case crop maintenance time
- Helping to improve farm yields
- Helping to restore degraded land

Beneficiaries: Rural producers of cereals, particularly those with insufficient manpower.
The direct beneficiaries of the BSP project are the members of the AZN, Wémanegré, Tenkeega, Weofinti and Tipweogo inter-village development associations. These associations have a membership of more than 61,000 cereal farmers, 31,720 of whom, or more than 50%, are women.

Implementers and roles

- **Rural development NGO (Terre Verte in the case of the BSP Project):** co-construction, support for implementation through its facilitators, capitalization of experience, etc.
- **Inter-village development associations (AZN, Wemanegré, Wéofinti, Tenkeega, Tipwéogo in the case of the BSP Project):** co-construction, experimentation through pilot producers, training and scaling up throughout the network.
- **Research structures (GRET and IRD in the case of the BSP Project):** evaluation of the effect of the technique on yields

Localized weeding

Stages of implementation

Introduction to the practice

The experiment was introduced in woodland developments in various villages covered by the 4 associations after consultations, organisation of the beneficiaries into land groups and their practical training (5 HJ) on site at the time of carrying out cultivation operations.

Technical itinerary

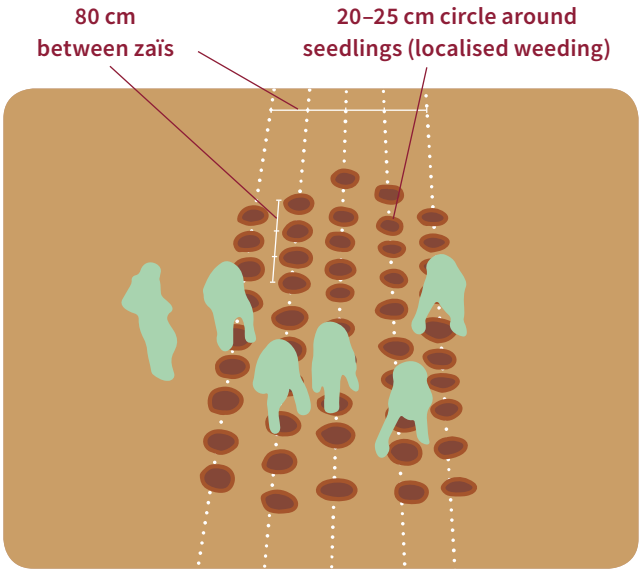
To successfully implement spot weeding, you need to:

- Prepare the field beforehand using the zaï technique* with a pickaxe (ensure that the zaï stakes are 80 × 80 centimetres apart)
- As soon as the first rain falls, sow in the zaï holes that have been filled with compost
- At the time of the first weeding after sowing (between the end of June and mid-July), choose to weed only very locally and manually with a hoe (or daba), in a circle of about 20 to 25 centimetres radius around the seedlings at the emergence stage. The area to be weeded is therefore very small compared with the total area sown
- With a spacing of 80 × 80 cm between the holes (on the rows and between the rows), the area to be weeded is only 20 to 30% of the total surface area of the field. Unharrowed areas remain grassy and help protect the soil against water erosion
- During the second weeding operation, when the crop bolts (late July to early August), which is quicker, the grower will take care not to injure the young crop plants. Using a machete, he will prune the weeds left between the plants during the first weeding and spread them between the bunches to mulch the bare spaces. Left in place, the weeds will provide valuable green manure for the growing crop.

Generally speaking, after the bolting phase, cereal plants (millet, sorghum or maize) dominate weeds, which can no longer hinder their growth.

* In the Sahel, zaï is a traditional system for rehabilitating the productivity of poor, encrusted land, which consists of manually digging holes to concentrate run-off water and organic matter (Le zaï, qu'est-ce que c'est ? **https://www.inter-reseaux.org/ressource/le-zai-quest-ce-que-cest/**)

Diagram of zaï and localised weeding



Resources mobilised

Natural resources: plot of land laid out and prepared using the zaï technique (with the appropriate spacing between planting beds); organic matter (e.g. compost)

Physical resources: pickaxes for digging holes (manual zaï), cart or tricycle or tractor with trailer (compost transport), dabas (weeding), machetes (pruning tall weeds), etc.

Human resources: 5 people with experience and training to weed for 4 to 5 days for 1 hectare, a pair of facilitators (to train growers and set up the protocol in the trial fields

Social resources: development associations, land groups

Estimated costs per hectare

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of equipment and technical materials		**Input costs**	
Pickaxes (1)	750	Sorghum seed (8 kg)	5,600
Carts (depreciated over 5 years) (1)	30,000	**Cost of labour**	
Dabas (1)	1,000	Weeding: 5 people for 5 working days, i.e. 25 HJ (1,250 FCFA × 5 × 5)	31,250
Machetes (1)	1,000		
		Total estimated cost	**69,600**

Results obtained

Physical results

Time savings of 50% on average. For a plot that was supposed to be weeded in 10 days, localised weeding means the field can be cleared in 5 days
- Drastic reduction (20 to 30%) in the area to be weeded compared with conventional weeding

Economic impact

- An increase in income of between 45% and 60% from the sale of harvest surpluses and the use of time saved on work
- Acquisition of animals or transport equipment such as tricycles with the additional income. This transport equipment is then hired out to transport compost and harvest

Social impact

- Job creation through young people using the time they save to work for other producers or in other activities such as petty trading (opportunity cost: 1250 FCFA/day)
- This additional income also enables us to pay our children's school fees
- Reducing the drudgery of work

Environmental impact

- Improved infiltration and reduced runoff thanks to grass growing between crops
- Improvement in soil organic matter levels due to the increase in herbaceous biomass during the second weeding operation, which serves as a green fertilizer
- Significant reduction in gully erosion: the grass left in place (giving the impression of a dirty field) significantly reduces runoff, thereby combating gully erosion and ultimately disfiguring the landscape

Innovative aspects

Localised weeding is a new practice in this region, as it is unknown to farmers in the Guiè area. The traditional way of maintaining crops is to use the daba several times to weed out the weeds that grow there.

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Scarce rainfall, making arid soils difficult to weed locally	Rainwater collection basins on plots to maintain soil moisture
Scarcity of trained labour for localised weeding work, sometimes prolonging working time	Raising young people's awareness of the need not to flee the land during cropping periods

Potential for adoption

- No additional financial investment
- Saves almost 50% of time on other activities
- Easy to apply for all cereal farmers in the Sahel zone
- Less restrictive than conventional weeding

In the case of the BSP Project, the adoption rate for localised weeding was around 40% of the farmers trained at the end of the project, with farmers clearly keen to adopt this practice.

Second weeding

Challenges and prospects for scaling up

- Support efforts to disseminate the practice on a large scale
- Carry out studies to quantify the time and energy saved and the monetary added value of the technique compared with traditional weed management in the fields
- Carry out studies demonstrating that the technique does not affect yield and therefore production compared with the traditional technique
- Test the technique on crops other than cereals (groundnuts, beans, etc.) to assess its effects

To find out more

Localized weeding technique for cereal crops in the Sahel. Terre Verte. 2 p.
https://eauterreverdure.org/download/Sarclage_localise_en_culture_cerealiere_au_Sahel.pdf

The zaï technique. Technical sheet n°5. Sahel People Service Association. 6 p.
https://pfongue.org/IMG/pdf/fiche-technique-5-la-technique-du-zai.pdf

Zaï Wa Yaa Tiim, Zaï is a solution (ZAN). Ciné Yam. 21'42".
https://www.youtube.com/watch?v=oB3a1runvqA

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Field after localized weeding

BP9: Biopesticides made from neem leaves, caïlcedrat bark and gnonkôrôdjalani

Presentation of best practice

biopesticides

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Peri-urban area, Bourem circle, Bamba commune (Gao region, Mali) and in 13 villages in the rural commune of Kiffosso 1 (Sikasso region, Mali)	Sahelian and pre-desert climate (Gao region) and Sudanian and Sudano-Sahelian climate (Sikasso region)	07/19 – 06/22

Biopesticides are natural substances of plant origin (here neem leaves, caïlcédrat bark and gnonkôrôdjalani), produced to treat crops against attacks by insect pests and other crop enemies (fungi, rodents, weeds).

Type: Technical
Scale: Plot
Type of crops grown: All types of crops (cereals, cash crops, vegetables and market garden produce)
Promoted by:
- Consortium NGO UAVES (Union for an Ecological and United Future), URCMP (Regional Union of Cooperatives of Market Gardeners and Planters of Gao), Commune Gounzourèye, CFP-PAS (The Vocational Training Centre for the Promotion of Sahelian Agriculture), dwithin the framework of the project "Support to farmers' organisations for innovation, adaptation of family farming systems and sustainable management of natural resources through Agro Ecology (AOPAE)" (financed by RAAF/ECOWAS with the support of AFD) and
- Consortium NGO AMEDD (Malian Association for Awareness of Sustainable Development), Sènèyiriwaton cooperative and the rural commune de Kiffosso 1, as part of the "Agro-ecological intensification and sustainable management of natural areas and resources (IAE)" project (financed by RAAF/ECOWAS with support from AFD)

Context of the experience

Farmers in the Gao and Sikasso regions are faced with the attack and destruction of their crops, particularly vegetables, by insects and other pests such as fungi and rodents. Many growers, particularly those in the Sikasso cotton region, use chemical pesticides to control these pests. As well as being costly for small-scale producers, these products have a number of negative effects, including health problems for humans and animals, air and soil pollution, the destruction of soil micro-fauna and useful insects, and a reduction in biodiversity. All this leads to plant diseases, soil impoverishment and lower agricultural yields.

In order to reverse this trend, the members of the AOPAE and IAE projects have initiated the mobilization of ecological processes offered by nature to produce biopesticides. These biopesticides offer a healthier alternative for humans in the fight against crop pests. The initiative consisted in organising and training producers in the production of biological pesticides (biopesticides) from neem leaves, cauliflower bark and the annual grass known as "gnonkôrôdjalani" in Bambara.

Problems the practice is intended to address

- Pest attacks on crops
- Health problems for humans, animals and crops linked to chemical pesticides
- Farmers' dependence on expensive and difficult-to-access synthetic fertilisers
- Water and soil pollution
- The loss of soil biodiversity
- Falling agricultural yields

Objective:
- Sustainable, low-cost crop pest control
- Restoring soil fertility
- Maintaining and improving the health of farmers
- Sustainably increasing agricultural yields

Beneficiaries: Rural producers
The AOPAE and IAE projects have reached the following beneficiaries:
- Market garden producers in the Gao region, including 537 (69 men and 468 women) direct beneficiaries and 150 (50 men, 60 women, 15 young boys and 25 girls) indirect beneficiaries
- Male and female producers in the rural Commune of Kiffosso1, including 2,752 women and 2,882 young people

Implementers and roles

- **NGOs (UAVES for AOPAE and AMEDD for IAE):** mobilising financial resources, training, technical supervision and advisory support
- **Groups/unions (such as the URCPM for AOPAE and the Sènèyiriwaton cooperative for IAE):** mobilization and organisation of all producer members (in the commune of Kiffosso 1, producers were organised into committees of 5 members) to produce and use biopesticides
- **Training centre (CFPAS for AOPAE):** implementation of the project's research-action activities
- **Technical services:** monitoring and technical support for market production activities
- **The administration (case of the Mairie of the rural commune of Kiffosso 1):** social mobilization for the production and use of biopesticides

Stages of implementation

Introduction to the practice

Beneficiaries are chosen from among volunteer farmers whose crops are often attacked, following information and awareness-raising sessions on the benefits of biopesticides at general meetings.

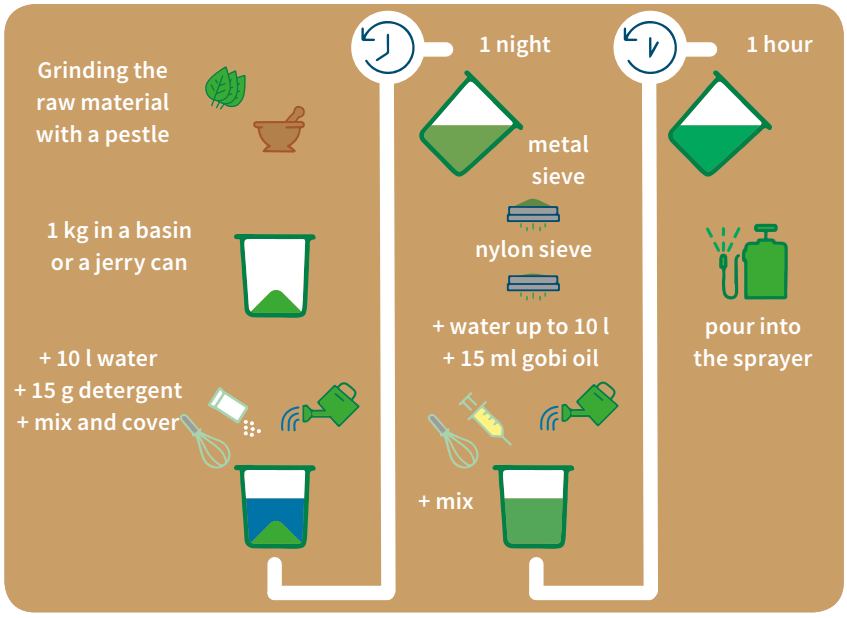
Presentation to women on biopesticide production

Technical itinerary

IAE experience (AMEDD)

Preparing the mixture

The preparation of the biopesticide follows the same procedure for each of the raw materials (neem leaves, caïlcédrat bark or gnonkôrôdjalani herb), as follows:
- Grind the material with a pestle in a mortar (for example, crush the neem leaves if you wish to prepare a biopesticide based on this material; the procedure is the same if you want to prepare a biopesticide based on caïlcédrat bark or gnonkôrôdjalani herb)
- Take 1 kg of this crushed material and put it in a bowl or container that can be closed
- Add 10 litres of water to the ground material in the can or basin
- Add 15 g of detergent (Omo or Barikatigui soap powder) or one (1) glass of crushed solid soap tea (Koulikoro)
- Stir the mixture (10 l water + 1 kg material + detergent/soap) until a homogeneous liquid is obtained
- Close the bowl or can and leave the mixture to stand overnight



Preparation of the biopesticide

Practical session on producing biopesticides in a vegetable garden

- The next morning, before spraying the field, pass the resulting mixture through a metal sieve used for flour
- Pass the previously sieved liquid through a second nylon sieve with a finer mesh
- If the mixture has absorbed some of the 10 litres of water overnight, top up the sieved liquid with water to 10 litres
- Using a syringe, take 10 millilitres or 10 cc (cm^3) of gobi oil and pour it into the liquid obtained, then mix everything together
- Leave the mixture (liquid obtained after the second sieving + 10 cc of gobi oil) to stand for at least one hour (1 h) to allow any elements that could clog the spray hose to settle
- Carefully pour the decanted liquid into a spray bottle to prevent any residue at the bottom of the container from entering

Treatment

- The treatment is a one-off and must be carried out at a calm time (without wind and not in the sun, preferably in the afternoon after 5.30 pm) to avoid dew and rain, which could reduce the effect of the bio-pesticide, but also and above all to prevent the sun's rays from destroying the azadirachtin which is the active ingredient in the neem leaves
- If it is raining at the time of spraying, stop spraying and wait for the rain to stop. After a few hours, make sure that all the leaves and stems are dry before resuming spraying
- If a sprayer is not available, treatment can be carried out using a broom or stalks soaked in the liquid to be sprayed on the leaves of the crops

Mixture shelf life

The decanted liquid can be kept for a maximum of 1 week. *After this period, the liquid may become poisonous to plants.*

Agronomic use

After sieving, the remains of neem leaves, caïlcedrat bark and crushed gnonkôrôdjalani stems can be used as fertiliser in market gardens, tree plantations and crop fields. They can also be added as ingredients to composting pits.

NB: To spray 1 ha, you need 4 kg of each chosen material or 32 litres of treatment mixture for each material (neem leaves, caïlcédrat bark or gnonkôrôdjalani grass).

AOPAE experiment (UAVES)

Biopesticide manufacturing process

- Crush approximately 3 kg of fresh neem leaves, if possible combining with 1 kg of green seeds
- Pour the mixture into a bucket and add 10 litres of clean water
- Leave to infuse for 12 to 24 hours in the shade until it has a greenish colour and a strong odour
- Filter the solution through a cloth sieve and add 10 litres of water

Use of biopesticide

- Dissolve 20 grams of previously ground Koulikoro soap in the solution just before use
- Spray (morning or evening) on entire plants: 3 litres of preparation for 10 m^2, so 30 litres will water 100 m^2.

NB: It is advisable to apply the product between 5 pm and 5.30 pm (around sunset) to ensure an immediate effect on crop pests before watering the following day.
If the level of attack is high, and especially for ladybirds that sit at the base of the leaves, the treatment can be repeated every 3 days.

Resources mobilised

Natural resources: water, biological substances (Neem leaves, Cailcedrat bark, Gnonkôrôdjalani herb, gobi oil)

Ressources chimiques: solid soap (Koulikoro) or soap powder (Omo or Barikatigui)

Physical resources: equipment (mortar and pestle, cans or basins, buckets, sprayer or broom or rods, metal sieve/nylon sieve, syringe, van)

Human resources: 2 people maximum (1 woman to harvest and crush the material and 1 man to prepare the spray mixture and carry out the treatment

Social resources: networks (even informal ones), producer organisations for technology appropriation and sharing

Estimated costs per hectare

The direct production costs of the biopesticide for one hectare are:

– With AMEDD (32 litres of biopesticide): FCFA 15,625, assuming that certain investments are amortised over 5 years
– With UAVES (50 litres biopesticide): 28,700 FCFA with depreciation of certain materials

Cost category	Cost (FCFA)
IAE experience (AMEDD)	
Cost of equipment and technical materials	
Mortar	3,500
Pestle	750
Sprayer (depreciated over 5 years)	5,000
Metal screen	200
Nylon sieves	200
Basin n°45 (depreciated over 5 years)	1,000
Bucket n°23 (depreciated over 5 years)	500
AOPAE experiment (UAVES)	
Cost of equipment and technical materials	
Mortar (depreciated over 5 years) + pestle	1,200
Bucket (depreciated over 5 years)	1,200
Fabric (sieve)	1,000
Sprayer 10 litres (depreciated over 5 years) at 20,000 FCFA	4,000

Cost category	Cost (FCFA)
32 litres of product	
Input costs	
Bottle of gobi oil (1 bottle for 10 l)	500 × 3 = 1,500
Crushed and ground neem leaves (1 kg for 10 l)	300 × 3 = 900
Soap/detergent (1 sachet of 15 g for 10 l)	25 × 3 = 75
Cost of labour	
Preparation of the product and treatment of 1 ha (2 people)	1,000 × 2 = 2,000
Total estimated cost	**15,625**
50 litres of product	
Input costs	
Neem leaves (3 kg)	900
Neem seeds (1 kg)	300
Natural soap (20 g)	400
Cost of labour	
Preparation of the product (2 hours per day for 10 litres, or 10 people for 50 litres) at 2,000 FCFA per person	20,000
Total estimated cost	**29,000**

Biopesticide can be sold at:
- With AMEDD: minimum 750 FCFA per litre when the main raw material (Neem leaves, Caïlcedrat bark or Gnokôrôd-jalani herb) is available and maximum 1,000 FCFA when it becomes scarce; this gives between 24,000 FCFA and 32,000 FCFA (for 32 litres) and a margin ranging from 8,375 to 16,375 FCFA.
- With UAVES: the price per litre varies but is generally around 600 FCFA, which gives a quantity of 30,000 FCFA per hectare and a margin of 1,300 FCFA

Results obtained

Physical results

- Reducing crop damage caused by pests
- Greater crop resistance to drought with lower water demand than chemically treated plots (two to three days apart compared with daily treatment)
- Better tasting market garden produce treated with biopesticides (no need to wait for consumption)
- Better health quality of market produce
- Longer shelf life for products treated with biopesticide

Economic impact

- Reduced production costs due to the abandonment of synthetic pesticides. For example, for 1 ha of cowpea, which is highly susceptible to attack, 3 × 1-litre bottles of chemical pesticide are needed, and each bottle costs FCFA 10,000, giving a cost of FCFA 30,000 per hectare. The biopesticide option saves between 1,FCFA/ha (with UAVES) and 14,375 FCFA/ha (with AMEDD)
- Market garden yields doubled
- Improved farm incomes as a result of lower production costs and higher yields

Social impact

- Improved social status for young people and women who have appropriated the technology: they participate in the governing bodies of market groups
- Reducing health problems for producers linked to the use of chemical pesticides

Environmental impact

- Better protection of crops and natural resources (soil, vegetation, water) and preservation of biodiversity (plant and animal
- Negative effects on neem plants (destruction of the leaves) and caïlcédrat plants: destruction by removal of the bark

Grinding leaves with a pestle

Innovative aspects

- The use of locally available natural resources (Neem leaves and others)
- The manufacture of an effective product at lower cost by small-scale producers themselves

Filtering and pouring the biopesticide into a sprayer

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Risk of shortage of raw materials (neem leaves, bark, etc.) if used on a large scale (cotton fields, cowpeas, etc.)	Limiting the use of this product on relatively smaller market gardening plots that consume small quantities of biopesticides Reforestation with the creation of an ecological garden, to compensate, protect and fertilise the garden
Hard work for producers (especially women)	Organising women for collective production

Potential for adoption

- Effectiveness and low production cost of the biopesticide (uses local natural resources)
- Easy to manufacture (technical expertise) and harmless (no health risk)

Challenges and prospects for scaling up

- Setting up biopesticide production units to increase output
- Supporting efforts to reforest species whose organs are used as inputs
- Support efforts to disseminate the practice on a large scale
- Subsidise the equipment needed to manufacture the bio-pesticide

Spraying the biopesticide

Testimony

"From now on, I'll have the plant protection product I need when I need it"

"My name is Hajara Kantao. I am 54 years old, married and the mother of 6 children. I'm a member of the "ACHILNO" women's market gardening group in the Djidara district of the urban commune of Gao. Our group, which now has 66 women, has benefited from the good practice of making biopesticide with neem leaves as part of the AOPAE project implemented by the NGO UAVES. Before this project, we used to fight crop pests with chemicals such as Furadan, Glyphosate and others. These pests were partly responsible for the low productivity of our market gardens, because of our low purchasing power when it came to accessing chemical pesticides.

I was able to benefit from the project through my group, which is a traditional partner of UAVES. I was particularly interested in obtaining low-cost, harmless pesticides for my market garden crops. The project provided financial resources to train us, improve our access to water (construction/rehabilitation of water sources), equip us and supply us with inputs. For our part, we have contributed our labour to carrying out the activities.

My friends and I welcome this initiative, which gives us access to pesticides based on natural products (neem leaves) that are inexpensive, not harmful to our health and, above all, that we can make ourselves locally. I can say that from now on, I'll have the plant protection product I need when I need it to deal with pests in my garden. I'm completely satisfied, but I'm asking the project to continue to support us, especially in terms of work equipment and permanent access to water."

"I used chemical pesticides to treat my plots of land which sometimes made us and our animals ill"

"My name is Mariam Sanou and I'm a housewife involved in market garden production with the "Sènèyiriwaton" cooperative in Kiffosso 1.

In the past, I used chemical pesticides to treat my plots of land against attacks, which sometimes made us and our animals ill. I was really worried, so when we were presented with the possibility of producing non-harmful agroecological pesticides using local materials, I immediately expressed my interest in benefiting from it.

We were provided with the necessary equipment and manufacturing inputs, as well as practical training. In return, we looked for the basic material (neem, caïlcedrat bark, gnonkôrôdjalani herb) and, during the practical sessions, we crushed it and prepared the sprays under the supervision of technical agents from the NGO AMEDD. Next, a trial of spraying by farmers was carried out on a nearby field under the supervision of AMEDD staff. Finally, we were given practical advice on how to store and renew the spray mixture.

I'm delighted to have benefited from this experience. Thanks to the knowledge, skills and materials I have acquired, I am now able to produce my own biopesticide slurries using local products, and I have a good knowledge of the ingredients that make these slurries more effective."

Mariam Sanou

To find out more

Making a neem-based biopesticide (in Bambara). NGO AMEDD. 11'10".
youtube.com/watch?v=TmWQwrNN034

Biopesticides: neem leaves (TAMCI project). IECD (Côte d'Ivoire). 2'27".
https://youtu.be/OckQg5AbTh8

Training guide: Agroecology to get away from pesticides. Reducing the use and risks of pesticides and veterinary products through viable alternative practices. AVSF, 2020. 186 p.
reca-niger.org/IMG/pdf/avsf-guidepesticides-def-web.pdf

Biopesticides for the good of the earth and living organisms. NGO ADESVK (Burkina Faso). 4 p.
https://araa.org/pasanao/files/classified/roppa_-_des_biopesticides_pour_le_bien_de_la_terre_et_du_viviant_-_bf.pdf

Biopesticides, complements and alternatives to chemical plant protection products (bibliographic summary). Deravel J., Krier F., Jacques Ph., 2013. Biotechnol. Agron. Soc. Environ. 2014 18(2), 220–232. 13 p.
popups.uliege.be/1780-4507/index.php?id=11072

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BP10: Farmer' seeds to increase the autonomy and strengthen the resilience of market garden producers

Presentation of best practice

farmer' seeds

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Bourem district, rural district of Taboye, peri-urban area of Bourem district (Gao region, Mali)	Sahelian and pre-desert climate	07/19 – 06/22

Promoting the use of farmer seeds means that market gardeners have access to quality seeds at lower cost, adapted to the vicissitudes of the agricultural calendar, which is subject to climate change.

Type: Technical
Scale: Plot
Type of crops grown: Market garden crops (lettuce, pepper, black aubergine, onion, tomato, Cayenne pepper, African aubergine)

Promoted by: Consortium UAVES (Union for an Ecological and United Future), URCMP (Regional Union of Cooperatives of Market Gardeners and Planters of Gao), Commune Gounzourèye, CFP-PAS (The Vocational Training Centre for the Promotion of Sahelian Agriculture) within the framework of the project "Support to farmers' organisations for innovation, adaptation of family farming systems and sustainable management of natural resources through Agro Ecology (AOPAE)" (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

Market gardeners are faced with a downward trend in crop yields because they use exotic seeds that are poorly adapted to the climate of their region. What's more, these seeds are relatively expensive and several resowings are sometimes necessary. This situation has begun to discourage market gardeners in the Gao region of Mali. It against this backdrop that the NGO UAVES and its partners set out to develop agroecological farmers' seeds adapted to their needs and to promote their use in the region. These low-cost, rapidly germinating seeds are produced in a portion of each market gardener's individual plots.

Problems the practice is intended to address

- Exotic seeds not adapted to the climate
- The high cost of exotic seeds

Objective:
To make available high-quality, low-cost agroecological farm seeds adapted to the agricultural calendar and the needs of market gardeners

Beneficiaries: Rural producers market gardeners
In the Gao region, 537 people benefited, including 69 men and 468 women

Implementers and roles

- **Development NGO (UAVES in the case of AOPAE):** diagnosis of market garden seed needs, experimentation through the centre for research-action on vegetable seeds (CAPROSET), multiplication of certified seeds by LABOSEM, dissemination of practices and monitoring of activities
- **Training centres (CFP-PAS):** monitoring experiments, liaising with agricultural research (CRRA) and monitoring activities
- **The local authority:** community mobilization facilitating access to land, facilitating relations with the administrative authorities and monitoring activities
- **The market gardeners' umbrella organisation (URCMP):** identifying market garden groups, helping to organise the marketing of market garden produce and monitoring project activities

Stages of implementation

Introduction to the practice

Various activities were carried out to introduce the experiment:
- Information and awareness meeting
- Selection of volunteer market gardeners
- Training farmers in the technique of producing farm-saved seeds (2HJ)
- Close monitoring of seed-growing farmers by UAVES technicians and the decentralised technical services of the Ministry of Agriculture (30 HJ)

Technical itinerary

1 Sowing

Period: September–May (depending on crop)

Nursery (duration = 20 and 45 days): depending on the crop (2 to 3 grams on 2 m^2 per 100m2 of crop
Examples: lettuce (3 to 5 grams/2m2 to transplant 100m2); tomato (3 grams of seeds sown on 3m2 of nursery for 100m2 of cultivation)

Transplanting: when plants have 4 to 6 true leaves

Protection:
- Mulch the nursery, cover with mosquito netting, leaves/shrubs, etc.
- Treat pests as soon as they appear using organic products (ash, oil and decoction of neem leaves or seeds, tobacco solution, chilli pepper, etc.)

2 Planting and maintenance

Bottom dressing: 150 to 300 kg of organic matter (well-matured compost) per 100m2, i.e. 5 kg/m^2 at CAPROSET due to the very sandy nature of the soil

Planting:
- Spacing: lettuce 30 × 25 cm; tomato 60 × 40 cm; pepper 40 × 50 cm
  NB: To preserve varietal purity, it is advisable to set different distances between 2 different varieties of the same crop, depending on whether it is self-pollinating or not: between 2 lettuces or 2 tomatoes: 5 to 10 m; between 2 peppers or 2 aubergines: 150m; and between 2 peppers: 100 m.
- Pay attention to wind direction as soon as crops are planted to ensure pollen transport
- Hoeing: especially at the start of cultivation
- Watering: daily, but very much in demand when the apples start to form (lettuce, cabbage) or when the other species are fruiting.

Treating attacks: Example of lettuce

Enemies	Damage	Treatments
Mushrooms	– Melting seedlings (root and collar rot) – Affected plants fall over and die	– No excess humidity – Disinfect seeds and soil before sowing *
Worms	Root-knot nematodes: poor development of the plant by forming galls (large nodules) on the roots	– Crop rotation of at least 3 years – Organic products (repellents): neem oil, neem leaf decoction
Caterpillars	Destroy the heart of the plant	Organic products (repellents)

* It should be noted that treatment of the seed is a preventive measure. Once attacked, it may not progress any further.

3 Harvesting and conserving vegetable seeds

The harvesting period for seeds depends on the crop. Occupancy ranges from 90 to 190 days.

Average production recorded per m^2/speculation:
- Lettuce: 111 g/m^2
- Peppers: 5 g/m^2
- Aubergine black beauty: 10 g/m^2
- Onion: 50 g/m^2 (production from mother bulb)
- Tomato: 5 g/m^2
- Cayenne pepper: 5 g/m^2
- African aubergine (Gaya Goyo): 10 g/m^2

Drying takes place in the shade in the drying sheds.

Packaging and wrapping: The seed is packaged in jars or paper bags with the seed's characteristics: logo of the structure, name of the crop, variety, weight, germination rate (+ 70–95%), year of production, expiry date.

Resources mobilised

Natural resources: seeds; water; compost; leaves/shrubs (mulch); organic repellents (ash, oil and decoction of Neem leaves or seeds, tobacco solution, chilli pepper, etc.)

Physical resources: storage warehouse, dryers, farming equipment, protective tarpaulins (to preserve the varietal purity of the seeds), cart, motorbike, tricycle, seed conservation jars, jute and fabric bags, sieves, scales, seed extraction bottles, van, etc.

Human resources: growers (around 840 man-days for sowing, planting, maintenance, processing, harvesting, drying, packaging), endogenous facilitators (men and women: 30 man-days), trainers (2 man-days), researchers, laboratory technicians, etc.

Social resources: community (mutual aid), market gardening groups

Estimated costs per hectare

The cost of producing CAPROSET lettuce seed (Galhawa variety) per hectare is estimated at around FCFA 9.5 million. The main expenses are for compost (FCFA 5 million), water (FCFA 500,000), jute and fabric bags for packaging (FCFA 1.2 million) and labour (around FCFA 1.7 million for 840 HJ).

The sale of seed produced on the same area gives the following results:

Designation/harvest	Unit	Price per unit	Quantity	Value (FCFA)
Products: – Lettuce seed (agroecological)	kg	50,000	1,110	55,500,000
Total				**55,500,000**

With a CAPROSET lettuce seed production of 1,110kg on an area of 1ha with a market value of 55,500,000 FCFA, and an investment of around 9,500,000 FCFA, the gain is evaluated at around 46,000,000 FCFA, for a 7-month lettuce growing season.

Results obtained

Physical results

- Increased market garden yields
- Increasing the shelf life of vegetable seeds
- Improving the organoleptic quality of market garden produce
- Improving the nutritional quality of meals (diversification of dishes)

Economic impact

- An increase in income for all market gardeners who have introduced the practice on their farms

Social impact

- Creation of well-paid jobs for young people and women involved in seed production and marketing (permanent labourers, warehousemen)
- Economic empowerment for women and young people
- Improving the social status of young people and women through their participation in the governing bodies of market gardening groups

Environmental impact

Locally produced seeds are better adapted to local conditions and require less use of chemicals, which helps to protect the environment.

Innovative aspects

- Using local seeds that are well adapted to agroecological conditions instead of improved seeds
- Empowering women and young people to access seeds. They are able to produce their own seeds

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Insufficient water	Creating market garden water points equipped with solar pumps
Insufficient means of water drainage	
Animals running at large	Fence off perimeters with wire mesh
Insufficient protected space to produce enough seeds	Lobby landowners for more space and fencing

Challenges and prospects for scaling up

- Strengthen technical support (training and monitoring) by increasing the number of endogenous facilitators
- Encourage producers to have access to the means of work that are often beyond their means
- Supporting producers in accessing water (boreholes) and protecting sites (wire fencing)
- Set up a system for certifying and marketing farmers' seeds
- Conduct dissemination campaigns using different channels and methods

Testimony

"Despite the particular difficulties that have marked the process […], I am confident that the experiment will continue"

"I am Mrs Youhamidou Abdou, 43 years old, married and mother of 2 children. I'm a member of the "Wafakay" women's group in Bagoundié 2, in the rural commune of Gounzourèye in the Gao Circle. Our group has a total of 43 members, including 03 men. We have benefited from the production of farmers' seeds as part of the AOPAE project implemented by the NGO UAVES.

Before the project, we used market seeds with low germination power, which meant that we couldn't produce much in our gardens. It was in this context that we were informed of the opportunity for support offered by the project, thanks to community awareness-raising sessions on agroecology organised by UAVES in the commune of Bourem and on local radio stations. We were motivated to have quality seeds in time for the agricultural calendar. The project therefore subsidised our training courses and provided follow-up technical support. The training, conducted in local languages (Songhoy and Tamacheq), covered the choice of seed carriers, harvesting, sorting and conservation of annual vegetable seeds. At the same time, we were introduced to maintenance and rehabilitation of water sources, equipment and inputs.

With this experience, I'm able to be self-sufficient in seeds adapted to the conditions of the natural environment and my production is larger than usual. Our customers are other market gardeners in need of seeds and tree planters, which gives me a substantial income. The experience is really beneficial because, as well as increasing our earnings, it updates our ancestral knowledge, which was once neglected.

Despite the particular difficulties that have marked the process, such as the lack of water, animals roaming the fields, the presence of crop pests, the lack of equipment and the insecurity that has limited the visits of endogenous facilitators to the market garden areas, I am confident that the experiment will continue."

To find out more

ADAD-MALI defends farmers' seeds
https://www.burkinadoc.milecole.org/agroecologie-afrique/agroecologie-mali/article-adad-mali/

Farmers' seeds in West Africa – Production guide. Association BEDE. 104 p.
https://souverainetealimentaire.org/5280-2/

Real seed producers: Small-scale producers safeguard, use, share and improve the seed diversity of the crops that feed Africa. AFSA and GRAIN.
https://grain.org/e/6045

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BP11: Gender and land: towards fair and sustainable access for women to agricultural land

Presentation of best practice

genre et foncier

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Commune of Diossong (village of Ndiaye Wolof), Senegal	North Sudan continental climate	07/19 – 06/22

Access to secure land for young people and women is a major challenge in the Thiès region, particularly in the Diossong commune. The YSM project is actively involved in this process raising awareness and lobbying public and traditional authorities.

Type: Social
Scale: Farm
Type of crops grown: Market garden crops
Promoted by: NGO Eclosio and COORDID (Rural Cooperative for the Development of the Djilor District) as part of the "Yessal Sunu Mbay (YSM): Cleaning up our agriculture" project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

In rural Senegal, women play an active role at all levels of the agricultural value chain, from production to processing and marketing. However, access to secure land is still beyond their reach. The lack of regular dialogue at community level and the poor application of land legislation make it difficult for women to secure their rights to land. These difficulties are exacerbated, on the one hand, by a lack of knowledge of the procedures for applying for land allocations and, on the other, by socio-cultural constraints that have long excluded women from the management and control of land assets, which have traditionally been passed down from father to son.

At the same time, since 2000 Senegal has been facing an employment crisis, a rural exodus and emigration affecting mainly women and young people. Although agriculture remains a potential source of employment for these groups, improving access to production factors such as water and secure land tenure, as well as increasing labour productivity, are needed to attract young people in particular.

Aware of these challenges, the NGO Eclosio and its local partners have launched the Yessal Sunu Mbay (YSM) project. The aim of the project is to help women and young people in Diossong and other localities gain better access to land, thereby promoting the sustainability of family farming and strengthening the economic empowerment of women and young people.

Problems the practice is intended to address

- Unavailability of secure land women and young people
- Poor knowledge of legal texts favouring equal access for men and women
- The persistence of socio-cultural obstacles that exclude women from the management and control of assets

Objective: Facilitating secure access to agricultural land for women and young people in order to strengthen their economic autonomy

Beneficiaries: rural women and young people
A total of 7 women, including 4 young people, benefited from the experiment in the village of Ndiaye Ndiaye Wolof.

Implementers and roles

- **NGOs (Eclosio as part of the YSM project) and government technical services:** awareness-raising and coaching for women to inform them of the possibilities access to land, awareness-raising for village chiefs and municipal authorities on the issue of women's access to land
- **Producer organisation (COORDID as part of the project):** informing and mobilising members

Stages of implementation

Introduction to the practice

Prior to implementation, awareness-raising sessions were organised for various stakeholders, starting with the women themselves. Subsequently, the customary and municipal authorities were also made aware of the issue. All applications for land titles are examined by the village chief before being submitted to the town hall, which is responsible for issuing the title deeds.

Technical details

- Raising women's awareness of their right to individual access to agricultural land, in accordance with the legal texts in force in Senegal, promoting equal access to land for men and women
- Lobbying local authorities and opinion leaders (traditional and religious) for s access to land
- Guarantee by the project to provide each woman with fencing and installation materials if they hold an individual title deed in their name
- Granting of 3 market garden plots to women (1 ha for 4 women; 0.5 ha for 2 women; 0.25 ha for 1 woman) by deliberation
- Purchase of fencing for the 3 market garden areas
- Purchase of eucalyptus stakes to serve as fixing posts
- Installation of windbreaks (living hedges) on each market garden perimeter
- Technical support for the development of perimeters (development of market gardening activities)

Resources mobilised

Natural resources: market gardens; hedgerows

Physical resources: fencing (to ensure that market gardening areas are secure); wooden stakes (to fix the fencing)

Human resources: women on their own (to make stakes), women and their families (to make trenches, install windbreaks and fix fences)

Social resources: collective organisation of women to raise awareness and develop market garden areas; traditional authorities made aware; municipal authorities made aware

Estimated costs per hectare

The estimated installation costs for each ¼ ha perimeter (for 1 woman) are:

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of equipment and technical materials		**Cost of labour**	
Wire mesh (10-year depreciation)	25,200	Installation of windbreak and wire mesh (36 HJ × 2,500)	90,000
Wooden stakes	30,600	**Total estimated cost**	**185,800**
Small equipment for setting up the perimeter	40,000		

Results obtained

Physical results

- Significant progress for the women in terms of access to secure land and a snowball effect: the allocation of plots of land resulting from the process initiated by the group of seven women has encouraged other young people (eight in total, including one woman) from two neighbouring villages to take steps to obtain occupancy titles for agricultural use
- Securing 3 market garden areas, acquired both legally (occupancy titles) and physically
- Creation of income and decent jobs for women and young people: in addition to the 7 women benefiting from the experiment, 11 people (6 on the large perimeter, 3 on the medium perimeter and 2 on the small perimeter), representing a temporary workforce, are mobilised. At the end of the season, the profits are divided between the participants

Economic impact

- Diversification of vegetable crops such as tomatoes, peppers, chillies, lettuce, aubergines, onions, etc., which the women sell on the local market. A woman can earn around 500,000 CFA francs for one production season, and they can produce three seasons a year
- Access to fresh, healthy market garden produce that keeps longer, so you can sell it at better prices
- Annual vegetable intake for household meals estimated at 200,000 FCFA on average. At the same time, their financial contributions to family expenses and children's school fees amount to around 250,000 FCFA

Social impact

- Strengthening women's leadership
- Improving women's social status by giving them title to land in their own name and enabling them to contribute to social events in their village and within their family with the additional income generated
- Improving the employment situation of women and young people, thereby curbing the exodus of women and illegal emigration of young people. In fact, each of the women benefiting from the scheme uses paid external labour. In 2022, all 3 perimeters employed 11 people for a period ranging from 3 to 6 months
- A commitment by the local authorities responsible for issuing property titles to facilitate and support the process of access to secure land for women and young people in the area

Innovative aspects

- Transition from collective acquisition of agricultural land (community market garden perimeter) to a form of individual acquisition
- Women's collective strategy to raise awareness in their respective households (husbands, sons, brothers, etc.), and then, with the support of the project, with the local authorities (village chief and town hall) to submit their application to obtain a land occupation title: working together to strengthen their arguments

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
The persistence of socio-cultural obstacles means that, despite the authorities' determination, the amount of land granted to women remains low (less than 1 hectare)	Highlight the solidarity and links within the families of landowners, the support of village or customary chiefs and the commitment of local authorities to grant occupancy titles
Cumbersome administrative procedures in the process of granting occupancy permits	Raising awareness and lobbying the structures in charge, strengthening support and monitoring at town council level
In view of the benefits generated by the perimeter, some fathers or husbands may be tempted to reclaim the plot of land they have already sold	It is important to have a real title of occupation to be able to defend your rights Awareness-raising sessions for all households
Ill-intentioned individuals, both in the village where the perimeter is located and in the immediate vicinity, could carry out acts of sabotage, such as destroying fences or introducing animals into production perimeters	Awareness-raising sessions for all communities Organise surveillance of perimeters

Potential for adoption

The success of such an initiative depends on effective collaboration with the local authorities. Thanks to transparent communication on the part of the project's technical team, these authorities have been able to fully appreciate the achievements in favour family farms in general, and women producers in particular, thus contributing to local development.

Raising awareness and involving local authorities from the outset are key steps in successfully advocating access to land for women. Similarly, highlighting women's contribution to local development, by promoting their market gardening activities to the authorities, was a decisive factor in winning the case. The women behind this plea must be dynamic, committed and motivated in their activities, and above all capable of promoting them. They need to be aware of the issues, informed about the procedures and determined to see their request through to the end, with the support of facilitators such as the project team or a cooperative.

To ensure the replicability of this experience, it is essential to adopt a participative and inclusive approach involving all stakeholders.

Challenges and prospects for scaling up

- Extensive publicity/media coverage of legal advances to promote women's land rights, and translation into local languages
- Promote large-scale training sessions on land procedures
- Support efforts to raise awareness among women's groups about this type of collective dynamic
- Strengthen advocacy with local authorities to enforce laws and regulations on access to factors of production (particularly land), and thus ensure responsible governance of resources
- Strengthen the support of opinion leaders (customary and religious) for the recognition of women's land rights
- Set up campaigns to issue land registrations to women in the communes
- Facilitate the acquisition of equipment to secure the land and develop the areas granted (subsidies, loans)

Testimony

"By improving our access to land, the YSM project has enabled us to relaunch our market gardening activities for the well-being of our families"

"We are Fana Touré, Anta Gaye, Amy Touré, Thioye Thiam, Aissatou Dieng, Fatou Touré and Diabou Touré, all residents of the village of Ndiaye Ndiaye Wolof, in the commune of Diossong. We are part of a women's economic interest group with 263 members, and with the support of the Fatick Integrated Development Project (PDIF), we were granted a permit by the town hall to farm a community plot of one (01) hectare. We grew vegetables and sold them at the market before sharing the profits between us.

But after a few years of operation, there was a rise in salt levels, which had an impact on the GIE's activity. The field was no longer producing and the women members of the group became discouraged. Many stopped taking part in the activities and stopped paying their contributions.

In the end, all that was left was the president of the GIE and the rest of us, who refused to give up. So we took the initiative of borrowing land from villagers and we built makeshift fences from thorn trees to protect these areas and prevent animals from roaming around. Unfortunately, these fences were not strong enough and the animals caused a lot of damage to our crops.

When the YSM project arrived, its team visited our borrowed plots and offered to support us in agroecological market gardening, provided we had land of our own with tenure titles. In the search for land of our own, we have, with the support of the project, conducted an advocacy campaign focusing on women's rights to access land. Unfortunately, this lobbying of the village chief, then the mayor of the commune and the sub-prefect was unsuccessful because there were no vacant lots in the village. So we turned to finding internal solutions with our families. In the end, each of us was given a 0.25 ha plot of land with individual occupancy titles granted by the local council.

So the obstacles to supporting the project were removed. We received support in the form of fencing and stakes, which we installed ourselves with the help of our family members to secure our land. Access to land has given us autonomy and a secure environment in which to carry out our market gardening activities and maintain our families' livelihoods. Since then, each of us has been proud of our contribution to the life of our household and of the greater respect in which we are held in our household and in society in general."

To find out more

Access to secure land tenure for women and young people is possible. "Yessal Sunu Mbaay" project, Capitalization sheet. Eclosio, 2022. 4 p.
https://mesecops.araa.org/document/projects/50/YSM%202%20Genre%20et%20Foncier%20V3.pdf

"Women's access to and control over secure land is likely to improve the resilience of their families". Sud Quotidien, 2023.
https://www.seneplus.com/societe/lacces-et-le-controle-dun-foncier-securise-par-les-femmes-est-de

Participatory vulnerability analysis of the communes of Diossong, Djilor, Missirah, Kédougou and Koussanar (Senegal) and establishment of dialogue groups on land and natural resources. IPAR, 2017.
http://www.ipar.sn/Analyse-participative-de-la-vulnerabilite-des-communes-de-Diossong-Djilor.html?lang=fr

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BP12: Aflasafe SN01, an effective and sustainable method to combat aflatoxins contamination in Senegal

Presentation of best practice

Aflasafe SN01

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Departments of Nioro and Kaolack (Kaolack region), Mbirkelane and Kaffrine (Kaffrine region), Senegal	North Sudan continental climate	07/19 – 06/22

Aflasafe SN01 is a biological product to combat field aflatoxin, a poison produced by a fungus that damages peanut and maize crops and the health of consumers and livestock, particularly poultry.

Type: Technical
Scale: Farm
Type of crops grown: Peanuts, maize
Promoted by: ASPRODEB (Senegalese Association for the Promotion of Grassroots Development), ISRA (Senegalese Institute for Agricultural Research), CCPA (Peanut Producers' Consultation Framework), PEFROMAS (Federation of Saloum Maize Producers), RNCPS (National Network of Seed Production Cooperatives), FONGS/AP (National Federation of Non-Governmental Organisations of Senegal / Action Paysanne), FONGS/ADAK (Association of Farmers in the Kaolack region), FONGS/EGABI (Entente des groupements associés de Birkelane) s part of the "Support for the Resilience of Agropastoral Family Farms to the Effects of Climate Change (PAREFA)" project (RAAF/ECOWAS funding, with support from AFD).

Context of the experience

The regions of Kaolack and Kaffrine, located in Senegal's groundnut basin, are facing heavy contamination of groundnuts and maize by aflatoxins, a poison that has a multitude of harmful effects. Aflatoxins are responsible for liver cancer and can sometimes lead to death. They also weaken the immune system and slow down children's growth, particularly in groundnut and maize-producing countries such as Senegal. In addition, contaminated feed can lead to hen mortality and reduce the productivity and profitability of livestock. Aflatoxin can also enter the human food supply through livestock products if animals are fed contaminated feed. Aflatoxin contamination is also a major obstacle to producers' access to remunerative markets (institutional and export markets) that apply strict aflatoxin standards.

Aflatoxins are produced by the soil fungi *Aspergillus flavus* and/or *Aspergillus parasiticus*. Contamination occurs either during production or during post-harvest handling and storage. In addition to climatic conditions, poor practices such as the use of poor quality seeds, late harvesting, delayed drying and inappropriate handling (transport and storage) of produce are factors that exacerbate aflatoxin contamination of agricultural produce in Africa. Faced with this threat, research has come up with an innovative solution: the use of Aflasafe SN01. This is a 100% natural biological product to combat aflatoxins from field to plate, made up of local non-toxic strains of Aspergillus flavus. These strains replace toxin-producing strains when they are spread on fields. By sporulating in the plant's rhizosphere, Aflasafe SN01 systematically reduces (by 80% to 99% at harvest and during storage) aflatoxin contamination of maize and peanuts (seeds in the field, before maturity or during post-harvest operations, after maturity).

Problems the practice is intended to address

- Aflatoxin contamination of groundnut and maize crops
- Production losses and reduced availability of food for consumption
- Major health risks for consumers and animals
- Reduction in the volumes that can be sold on markets that pay producers, and therefore a drop in income

Objective: To reduce aflatoxin levels in groundnut and maize crops, in order to reduce the negative impact on human and animal health and increase producers' incomes

Beneficiaries: Rural producers
The direct beneficiaries of the experiment were 75 groundnut and maize-producing Family Farming Enterprises (FFEs) that tested Aflasafe SN01

Implementers and roles

- **Producer umbrella organisations (POF):** identification of beneficiary FAEs that will carry out activities in the field
- **Supplier of Aflasafe® SN01**
- **The technical support system (focal point technician and facilitator) set up by the FPOs:** support for the implementation of the activity
- **The various players in the value chain (marketing, processing, consumption, etc.)**

Stages of implementation

Introduction to the practice

Producers were first informed about the initiative and the objectives of the project. Next, those who volunteered to take part were identified.

Technical itinerary

To ensure that Aflasafe® is effective, it should be applied as follows:

- Carry out all tillage operations involving covering or burying the soil beforehand (ploughing, weeding, spreading fertiliser, etc.) in order to prevent Aflasafe from being buried in the soil; *the product must remain on the surface, on the ground*
- Broadcast Aflasafe 2 to 3 weeks before flowering (recommended rate: 30 kg/ha):
  - At mid-flowering for groundnuts (around 35–45 days after crop emergence) and at the start of female heading for maize, and when the soil is sufficiently moist to stimulate sporulation

Conditions for success

- Sow varieties recommended for the area (respect the variety map)
- Use certified seeds that guarantee a germination rate of at least 80%
- Follow good cultivation practices, in particular good soil preparation, sowing at the right density and time, and good maintenance of the plot to avoid competition from weeds

Training on Aflasafe and aflatoxin by PPD agents

Aflasafe SN01

Resources mobilised

Natural resources: land used to grow groundnuts and maize

Physical resources: Aflasafe products® (30 kg/ha)

Human resources: family labour (around 4 men/day to apply the product) and expertise (technicians from the Plant Protection Department and, if necessary, researchers)

Social resources: FBO networks; consumer networks

Estimated costs per hectare

Cost of a kilo of Aflasafe®: between 7,000 FCFA (USD 12) and 12,000 FCFA (USD 20)

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Input costs		Cost of labour	
Purchase of Aflasafe (30 kg) (30 × 7,000 FCFA)	210,000	Application (4 HJ) (4 × 3,100)	12,400
		Total estimated cost	**222,400**

Results obtained

Physical results

- Significant reduction in aflatoxin contamination of crops
- Marketing of maize and groundnuts at the tolerated threshold of less than 15 ppb aflatoxin

Economic impact

- Reducing yield losses on maize and groundnut crops
- Increase in the volume of marketable agricultural products, and in the value and eligibility of products on lucrative markets: institutional and export markets, particularly in Europe and the United States, for which stricter regulations set contamination limit standards (in parts per billion/ppb) at 4 ppb and 20 ppb respectively
- Improving the profitability of poultry production by reducing diseases
- Increased income for producers

Social impact

- Improving the nutritional and health quality of products
- Reducing human morbidity and mortality

Environmental impact

- Aflasafe is an organic, 100% natural product that does not harm the environment or hens, guinea fowl, birds or wildlife, which can sometimes absorb a few grains of Aflasafe

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Access to Aflasafe remains the main constraint (quantity and cost)	Supporting producers in the area to disseminate this on a large scale

Healthy-looking peanut grains

Peanuts heavily contaminated with aflatoxin

Potential for adoption

- Product effective in different production areas of Senegal (tests carried out over 5 years on small farms)
- Easy to apply
- High efficacy of the multi-strain product in trials run entirely by resource-poor smallholders and the readiness of both public and private sector stakeholders to adopt the technology

Challenges and prospects for scaling up

The use of Aflasafe on a large scale is a major challenge, particularly for Africa, where it is estimated that around 40% of products on African markets exceed the maximum aflatoxin levels of 0 to 35 µg/kg, with a median of 10 µg/kg. For this reason, the large-scale introduction of aflatoxin into the quality production system of AFEs is one of the strategic areas to be prioritised in agroecological transition techniques and practices. In terms of potential solutions for scaling up the application of Aflasafe on crops, the focus should be on the following actions:

- An information and awareness campaign on the problems of aflatoxin contamination and the agronomic, economic and health consequences, and the possibility of mitigation with Aflasafe in all the major groundnut and maize production basins in Senegal and Africa
- Providing evidence for the formulation of good legislation, policies and interventions relating to aflatoxins
- Setting up early warning systems for aflatoxin epidemics
- Continuation of Aflasafe trials in various African countries
- The installation of modular Aflasafe manufacturing plants to encourage local production and adoption (examples: Kenya, Senegal)
- Increased dissemination and commercialisation via the private and public sectors (possibility of public subsidy) and public-private partnerships
- The granting of licences to the private and public sectors for the manufacture, distribution and marketing of Aflasafe
- Extending the policy of subsidising agricultural inputs and equipment to Aflasafe to make them more readily available to small farmers, who account for the majority of agricultural production
- Taking into account the role played by women in managing production before and after harvesting and household consumption
- Large-scale dissemination of genetic material that is more resistant to aflatoxins, such as groundnut varieties 73–33, 55–437, ICGV 87–084, J11 and GC8–35, which have already been released and are grown in Senegal
- Helping players to learn about best practice in combating contamination throughout the market supply chain (farming practices, drying, storage, transport)

Testimony

"With Aflasafe, my groundnuts remain of very good quality for a long time and I sell them better than before"

"My name is Fatou Ndiaye, I'm 50 years old and I live in the village of Thiakho Thiofor in the commune of Ndiaffate after spending more than fifteen years in Dakar. Since my return to the village, I've been involved in farming, cultivating a 2-hectare field inherited from my family. I grow millet, groundnuts and maize, and my crops are for home consumption and the market. I'm a member of the Peanut Producers' Consultative Body (CCPA), which gives me access to agricultural inputs (seeds and fertilisers) on credit for the season. For a long time, I saw a lot of post-harvest damage, particularly to groundnuts. When sorting the seeds, I would lose at least 5 kg of damaged, mouldy seeds from a 50 kg sack, which were unfit for sale and consumption. In terms of my overall production, this damage was a major loss, especially from an economic point of view, and I made a point of pointing this out to the group's managers when I was selling my products.

It was in this context that I was selected by PAREFA to benefit from the use of Aflasafe. Along with others, I was made aware of and trained in the use of the product, as well as the dangers of aflatoxin and the damage it could cause both to crops and to human health. Following this, I was given bags of Aflasafe to cover my 2 hectares.

I followed the instructions and at harvest time I noticed a change in the quality of my groundnuts. I didn't have to sort the seeds, because I didn't notice any attacks and my groundnuts, despite being kept in bags for a long time, didn't undergo any changes, which enabled me to increase my income when I sold them. What's more, we eat groundnuts without fear of health risks.

Fatou Ndiaye

Aflasafe is effective and I intend to continue using it in the coming growing seasons"

To find out more

Aflasafe® and aflatoxins: Basic questions and answers. IITA, USDA and CGIAR. 4 p.
https://aflasafe.com/wp-content/uploads/general/Aflasafe-Q&A-Fr.pdf

The Aflasafe Technology Transfer and Commercialisation Initiative (ATTC). 4 p.
https://aflasafe.com/wp-content/uploads/pdf/ATTC-brochure-French.pdf

The Aflatoxin Problem on Groundnut in West Africa. Amadou Lamine SENGHOR. 26 diapos.
https://www.aflatoxinpartnership.org/sites/default/files/2018-06/2.2%20-%20The%20aflatoxin%20challenge%20to%20the%20GN%20sector%20in%20West%20Africa.pdf

Aflasafe, a nature based bioprotectant to mitigate aflatoxin contamination in Africa. IITA. 1'08".
https://www.youtube.com/watch?v=xrZEEf544bQ

The story of aflatoxin and the effective solution, aflasafe! IITA. 4'26".
https://youtube.com/watch?v=L-ZBWLYGSuY

Aflatoxin kills! Aflasafe protects your maize and peanuts from this deadly poison. IITA. 3 p.
https://aflasafe.com/wp-content/uploads/pdf/Aflasafe_farmer_how-to_SN_French.pdf

Why use Aflasafe to combat aflatoxin, Senegal (Mandingue). Aflasafe. 6'18".
https://www.youtube.com/watch?v=jRxlhGEAJKQ

Using Aflasafe to protect maize and groundnuts from aflatoxin, Nigeria. Aflasafe. 5'43".
https://www.youtube.com/watch?v=sipMrcFNmTE

Quality of products intended for institutional food markets: Management of aflatoxin contamination risks. ECOWAS. 16 p.
https://www.inter-reseaux.org/wp-content/uploads/capitalisation_aflatoxine_marche_sinstitutionnels_vf_fr_050719.pdf

Impacts of aflatoxin and potential solutions in the fields agriculture, trade and health. Partnership to Combat Aflatoxin in Africa (PACA). 13 p.
https://au.int/sites/default/files/newsevents/workingdocuments/13898-wd-effets_de_laflatoxines_copy.pdf

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BP13: The family vegetable garden, a source of resilience for rural households

Presentation of best practice

family vegetable garden

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Villages of Diossong (R. Fatick) and Dialacoto (R. Tambacounda), Senegal	North Sudan continental climate	07/19 – 06/22

The family kitchen garden, also known in Senegal as "safal sa cin" or "seasoning the kitchen", is a special space within households dedicated to the production of healthy, diversified food. It consists of a small plot of land measuring 20 to 500 m2 or more, located on the outskirts of concessions and managed by women who apply agroecological techniques in the form of a technological package.

Type: Technical
Scale: Plot
Type of crops grown: garden crops
Promoted by:
NGO Eclosio, COORDID (Rural Cooperative for the Development of the Djilor District) and COORDIM (Missarah Rural Cooperative for Inclusive Development) as part of the "Yessal Sunu Mbay (YSM): Cleaning up our agriculture" project (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

Women living in rural Senegal have always had access to "hut fields" (called Nguendd in Wolof, Naako in Mandinka and Koulang in Serer) or "granaries", which are plots of land set aside within concessions. These areas are dedicated to the production of certain vegetables during the winter months, for household consumption. The "champs de case" is a traditional practice, but its scope is limited by women's lack of technical skills and the lack of diversification in production due to its uni-seasonal nature. As a result, rural households are only supplied with fresh vegetables for a short period of the year, seriously affecting the nutritional quality of family meals.

To remedy this limitation, the NGO Eclosio, which includes women among its main beneficiaries, has, through the Yessal Sunu Mbay (YSM) project, set up small areas for their benefit called "potagers familiaux" to enable them to carry out their market gardening activities. The concept of the "potager familial" (also known as "safal sa cin" or "assaisonner sa cuisine") has been improved through introduction of agroecological practices, such as the use of compost instead of fertiliser, mulching to save water and crop associations to diversify production and control pests. This model has proved to be a major source of resilience in the face of climatic and health crises, such as the COVID-19 pandemic.

Problems the practice is intended to address

- Insufficient supply of fresh vegetables to rural households for much of the year
- Women's insecurity of land tenure
- The poor quality of market garden produce

Objective:
- Facilitating constant access to fresh, healthy and varied vegetables, improving the nutrition and health of members of rural households
- Reinforcing the social status of women

Beneficiaries: rural women
As part of the YSM project, the beneficiaries are 116 women with family vegetable gardens (50 in the Dialacoto area and 66 in the Diossong area), spread across around twenty villages.

Implementers and roles

- **Supporting NGO (Eclosio as part of the YSM project):** identification of women, support to strengthen their technical and financial capacities
- **Local relays:** disseminating family vegetable gardens and agroecological practices (techniques for developing a plot, setting up a market garden nursery, transplanting and maintaining crops, recycling household and plastic waste, etc.)
- **Women leaders:** bringing action to communities

Stages of implementation

Introduction to the practice

The women beneficiaries were identified on the basis of criteria such as motivation, availability of secure areas, proximity to a water source and a willingness to share the experience, practices and knowledge they had acquired with their peers. These women beneficiaries ("relay producers") are then tasked with inspiring other women in their community and providing them with guidance in setting up their own vegetable gardens, thereby promoting the sustainability and scaling-up of agroecological practices.

Implementation of the practice

The "safal sa cin" family vegetable garden, a small plot of between 20 and 500 m^2 or more, is set up as follows:
- Initially, the project's technicians will train the "relay producers" chosen from the "farmer field schools" (FFS) in various agroecological practices
- Application of agroecological practices in the form of resilient technological packages, in particular:
  - Compost production and use: composting is carried out by women using inputs available in the village: poultry droppings, straw, food waste, etc.
  - Production and use of biopesticides
  - Crop combinations: this involves using crop combinations to limit attacks by crop pests
  - Mulching with crop residues: mulching is applied and combined with the installation of troughs to optimise water, which is scarce and expensive in this context

Two farmer field schools (FFS) were set up in Diossong and Dialacoto, in women's market gardening areas, by the YSM & Modèle de Développement Durable projects (Project in progress). Each woman, at within the market garden area, had a small plot where she grew a variety of vegetables using the practices learned at the FFS.

Resources mobilised

Natural resources: secure land (2–500 m²) within the family plot or nearby; a source of water (well or tap) for watering

Physical resources: a kit of small agricultural equipment (watering can, barrel for producing bio-pesticides, small sprayer for spraying, rake, shovel, hilar, etc.); barbed wire for fencing (leaves, millet stalks or other cereals, recycled netting or mosquito netting); agricultural inputs (seeds, compost).

Human resources: women and relay farmers (knowledge of market gardening techniques and agroecological practices) and other family members (e.g. children who help with watering)

Social resources: local social agreement between women

Estimated costs per hectare

To set up a one-hectare vegetable garden (approximately 33 plots of 300 m² each) using a barbed wire fence model, the estimated cost is:

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of equipment and technical materials		**Input costs**	
Barbed wire fence * (depreciated over 10 years)	211,200	Seeds for various vegetable crops	990,000
Small working equipment (pickaxes, dabas, watering cans, etc.)	63,500	Manure and compost	120,000
* The fence can also be made of cretin leaves, millet stalks or other cereals, recycled netting or mosquito nets		**Cost of labour**	
		Soil preparation, sowing, maintenance, harvesting, packaging (60 HJ × 2,500 FCFA)	150,000
		Total estimated cost	**1,534,700**

Results obtained

Physical results

- Setting up 116 family vegetable gardens, including 50 in the Dialocoto area and 66 in the Diossong area, affecting around twenty villages
- Dissemination of agroecological practices and capacity-building for women in these practices
- Training 120 relay farmers, including 53 women, in good farming practices (composting, mulching, treatment and pest control) in field crops and market gardening through 7 training sessions
- Enhancement of the role of the women who act as intermediaries for the CEP and consolidation of peer groups to promote mutual capacity-building on best practices and sustainable market gardening techniques
- Increased availability of vegetables, 30% of which are consumed by households themselves

Economic impact

- Reduced household spending, with no longer buying vegetables on the market and no longer using chemical inputs
- Increased income: the sale of surplus produce generates income. For example, a woman who benefited from the project obtained between 20,000 FCFA and 30,000 FCFA per month, depending on the type of products sold
- Participation in tontines with additional income. For example, a female beneficiary was able to contribute 15,000 FCFA per month to a tontine, enabling her to receive 150,000 FCFA after 10 months
- Purchase of livestock (goats, cows) and diversification of women's activities (e.g. purchase of household electrical equipment to sell juice, iced water, etc.) with the income generated
- A cost/benefit ratio with significant advantages. After a normal season, the woman is able to make a significant contribution to the family budget, easily rebuilding her working capital and even saving for other investments. The cost/benefit analysis of the vegetable gardens shows that the benefits derived from Naako production far outweigh the investment and operating costs

Social impact

- Improving household food and nutritional security through regular consumption of a variety of quality vegetables. Before adopting this practice, households bought their vegetables at the weekly market, with average quantities for a family of 10 comprising carrots, aubergines, cabbage, tomatoes and onions
- With practice, vegetables of good quality and in sufficient quantity are now available nearby and used by households
- Schoolchildren's snacks now include lettuce and vegetables from the family kitchen garden, substantially improving the balance of their meals
- Women's social status is enhanced by the significant contribution they make to household food supplies. In addition to the direct use of vegetables, the sale of surpluses generates income that helps to ensure food and nutritional security (purchase of foodstuffs) and to pay the families' social charges (water and electricity bills, health care, etc.)

Environmental impact

- Reducing the use of chemical fertilisers and pesticides, thereby helping to preserve the soil and the environment. The recycling of manure and some household waste through composting has improved waste management in households, helping to improve health and the environment
- The existence of these small green niches within villages attracts certain pollinating species (bees, butterflies, birds), which promotes biodiversity. Similarly, the introduction of trees creates a favourable microclimate by providing more humidity, coolness and shade, while also helping to fix CO_2 and improve soil fertility.

Innovative aspects

- Continuous production of healthy, varied vegetables throughout the year, unlike traditional hut fields
- Alternative practices implemented, with abandonment of the use of chemical fertilisers and pesticides
- Home production of compost and biopesticides using locally available products
- Shared learning by peer educators within the CEP and the development of local expertise in agroecology (human capital)

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Rampaging animals running into makeshift fences and destroying nurseries and plants in production	Strengthen support for the availability of solid means of security (women used rudimentary means to protect their plots (fencing, netting) Raising farmers' awareness of the importance of keeping animals on the station
Relatively high cost of water bills for women who irrigate with tap water (borehole)	Building women's skills in low-cost irrigation methods, encouraging and supporting the development of small-scale drip irrigation techniques
The long distance between the water point and the plot, which makes it difficult for some beneficiaries to water their plants	Systematically mulch market garden plots to retain moisture for longer and reduce the frequency of watering
The isolation of certain villages far from access routes makes it difficult to market surplus vegetable garden produce, especially during the winter months	Organise women producers into networks to facilitate access to the market and improve the marketing of surplus production Strengthen their organisational capacities by supporting the setting up of a consultation framework in each zone and networks between zones, to act as platforms for exchange and cooperation between growers in preparation for the market gardening campaigns
A shortage of small gardening equipment (shovels, rakes, watering cans)	Equipment hire Purchase of collective equipment

Potential for adoption

The economic and social viability of home gardens is an important factor in their spread. They benefit from a favourable environment, as family plots have enough space on their outskirts for them to be set up, in addition to being appropriated and socially accepted by the community.

The economic benefits (provision of a healthy and varied diet, generation of regular income, empowerment of women) and social benefits (household resilience in the face of various crises, understanding and solidarity within the household and between neighbours, etc.) strengthen the commitment and motivation of women beneficiaries to become more involved in family vegetable gardens. The economic and social impact of the kitchen garden on the family is so great that the gardens are no longer managed exclusively by the woman, who used to work alone on a daily basis, but have become a shared productive asset on which all members of the family, including the father and children, depend for their contribution to the family's well-being.

The CEP approach, which has encouraged the emergence of volunteer relay farmers who play a decisive role in disseminating agroecological practices. They were selected on the basis of their interest in and commitment to promoting development initiatives, and their willingness to support and mentor their peers in this process of agroecological transition. As a result, the relay producers have proved to be reliable factors in sustaining and scaling up family vegetable gardens and other agroecological practices.

This method represents a modest investment, but has a significant impact within villages in terms of cost/benefit, and is proving particularly effective in disseminating and adopting agroecological practices.

Home gardens require limited production resources (land, farming equipment, etc.) and remain an accessible investment model for women. What's more, they help to strengthen the cohesion and social status of women, both within the home and in the community.

Challenges and prospects for scaling up

- Supporting women to make their gardens more secure: encouragement (subsidy) to invest in solid fencing to make their vegetable gardens more secure by installing wire fencing or barbed wire, planting thorny hedges, etc.
- Provide more support for women's technical and organisational capacity building (CEP, innovation networks, etc.)
- Facilitate the marketing of agroecological products through:
  - Strengthening women's negotiating skills in relation to other players in the sector and improving the marketing of surplus production by organising them into networks
  - Promoting a specific label for products derived from agroecological practices, adopting a quality approach and setting up dedicated markets
  - Supporting and strengthening the development of small processing units for products from market gardening and livestock farming
  - Training women beneficiaries in product processing, packaging and preservation techniques; the skills they acquire will enable them to diversify their product range and be less vulnerable to the vagaries of the market
- Strengthen the organisational capacities of women growers by supporting the setting up of consultation frameworks in each zone and networks between zones, to act as platforms for exchange and cooperation between women growers in preparation for the market gardening campaigns.

Testimony

"The vegetable garden has changed my life"

"My name is Sahaba Sow and I am 47 years old. I live in the village of Keur Aliou Diop, in the commune of Diossong, in the Fatick region. I'm a member of an economic interest group made up of 70 women from the village, and we used to carry out our farming activities in a community field. However, the activities carried out there were not profitable, and the meagre income we earned didn't cover all our needs. To prepare our meals, we bought our vegetables at the weekly markets, but they weren't fresh, some even rotted, and they weren't available every day. In the end, vegetables were absent from our food, which was a source of deficiencies, especially for the children.

It was against this backdrop that the "Yessal Sunu Mbaye" project came into being, with the aim of promoting agroecological practices in vegetable production in kitchen gardens. Together with my GIE, we received training in agroecological vegetable production practices (choice of suitable seeds, good vegetable nursery techniques, composting, techniques for producing bio-pesticides based on cassia and garlic leaves) in the Champs Écoles Paysans (CEP). The knowledge acquired in the FSEs was then applied to our family vegetable gardens or 'safal sa tchin', which were placed behind our homes to produce vegetables for consumption. To do this, I had to make improvements (protecting my plot of around 100 m² and a watering point) at my own expense (around 30,000 FCFA), while the project provided me with market garden seeds and fruit trees. I then installed market garden beds and made compost from sheep-fold waste, as well as bio-pesticide. For production, I combined various vegetables effectively in the same space. Today, with the help of my children, I grow tomatoes, aubergines, onions, cabbages and chilli peppers in accordance with agroecological standards, without the use of chemicals.

The impact of the project on my life has been spectacular. Today, I can safely incorporate the fresh vegetables I grow into my family's daily diet. What's more, with the family gardens and the good yields I get, I sell part of my harvest, first to my neighbours to make sure they eat healthy produce, and then at the weekly market. I sell my vegetables at competitive prices, thanks to their good quality, and I manage to keep them for a very long time. What's more, the activity took place at a time when COVID 19 had put the brakes on a number of activities, and no-one was able to travel. So the family vegetable garden helped me to get through the crisis without any problems. All the activities carried out as part of the project enabled me, after two years, to save enough money to fulfil one of my greatest wishes, to buy myself a bedroom and some household appliances. The change in my social situation has also made a number of women aware of the importance of vegetable gardens in improving living conditions."

To find out more

Les potagers familiaux, une source de résilience des ménages ruraux. Projet “Yessal Sunu Mbaay”, fiche de capitalisation. Eclosio, 2022. 4 p.
https://mesecops.araa.org/document/projects/50/YSM%201%20Les%20potagers%20familiaux%20V3.pdf

The vegetable garden in tropical zones. Agrodok series n°9.
https://www.doc-developpement-durable.org/file/Elevages/Guides-Agrodok/Jardins-Potagers-en-zone-tropicale_Agrodok.pdf

Family vegetable gardens in Senegal. Eclosio. 4’29”
https://youtu.be/rVL-Q7yoNCE

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BP14: Community listening clubs (CLC) to raise awareness of the need to adopt agroecological practices

Presentation of best practice

community listening clubs

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Prefectures of Tchamba, Sotoboua and Est-Mono, Togo	Sudanian and Guinean climate	07/19 – 06/22

A community listening club is a group of men and women who wish to actively and systematically listen to radio programmes in order to discuss the content and, above all, to put into practice the lessons they have learned. In the context of agroecology, they are designed to support the dissemination of technologies with a view to strengthening the productive capacity of family farms on a sustainable and sound basis.

Type: Social
Scale: Landscape
Type of crops grown: All crops
Promoted by: ETD (Enterprise, Territories and Development), CPC Togo (Central Cereal Producers of Togo) et OADEL (Food and Local Development Organisation) as part of the "Projet de consolidation et de mise à l'échelle des pratiques agroécologiques dans les régions des Plateaux et centrale (ProCEPA)" (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

Farmers in Togo's Central and Plateau regions face two types of constraints. Not only are their farming activities coming up against a soil fertility crisis that is leading to a fall in crop yields and household incomes, but the technical solutions proposed by development organisations (NGOs and government extension services) to reverse these trends are not easily accessible to them. The ProCEPA project has wisely chosen to work on both fronts: providing technical solutions based on agroecological practices and ensuring that these solutions are known by the local population. The Community Listening Clubs (CLC) are designed to support the dissemination of the technologies proposed by the project, with a view to strengthening the productive capacity of family farms on a sustainable and sound basis.

Problems the practice is intended to address

- Lack of information on agroecological practices promoted by agricultural stakeholders
- Lack of forums for discussion of agroecology issues

Objective:
- Scaling up agroecological practices via local community radio stations
- Promote the establishment of a framework for exchanges on issues related to agroecology, gender, climate change, access to resources and other themes, etc.
- Encourage better sharing of information with producers

Beneficiaries: Rural producers
The direct beneficiaries of the ProCEPA project are 210 producers (including 59 women) who are members of the Unions of Cereal Producers' Organisations (UOPC) in the project area. Indirectly, 2,520 producers and their families are targeted

Implementers and roles

- **Community Listening Clubs (CLC):** their role is to discuss previously identified themes during debates led by leaders identified by the moderator; to organise the production of the programme; to listen to the broadcast of the programme (this listening can be collective or individual) and to take part in the debates; to take decisions to take action; to look for ways to take action and to pass on the experience to the rest of the community
- **Local radio:** planning programmes with the clubs, drawing up the programme protocol and producing interactive talk shows
- **Community leaders (e.g. local authorities):** supporting and facilitating CLC activities

Stages of implementation

1 Setting up listening clubs

- Meeting the local authorities and discussing the initiative with them
- Making contact with UOPC member producers
- Planning awareness campaigns with producers
- Raising awareness of ECCs
- Definition of selection criteria with the members themselves
- Selection of members (15) by the heads of the UOPCs
- Centralisation of the list of members
- Meeting scheduled to elect officers
- Election of officers
- Organisation of a meeting to define venues and times for training sessions
- Discussions on themes and preparation of activity sheets
- Coordination of themes with members
- Return of CLC members to other cooperative members

Beneficiaries were selected on the basis of the following criteria:
- Be a member of a cooperative or union of producer cooperatives
- Be willing to adopt agroecological practices and accept support
- Volunteering
- Be proposed by your cooperative or cooperative union, on the basis of your motivations
- Be dynamic within the cooperative or union
- Be available to take part in events and debates
- Be able to share
- Be fluent in at least two of the local languages to facilitate presentations and feedback

2 Partnership with local radio stations

- Identification of radios
- Contacting these radio stations
- Choice of radios
- Emissions trading
- Drafting of partnership contracts for club activities
- Signing of contracts with radio stations
- Emissions planning
- Making the programmes

3 How do you run a community listening club?

CLCs operate in the same way in every locality. Each club elects a chairperson, a deputy chairperson and three leaders to lead the debates. Implementation has focused on cross-cutting issues such as gender and social equity, in particular through the running of community listening clubs and the production of radio programmes to ensure that other producers and their families are listened to. The leadership method is participatory. It is based on the following aspects:
- Introducing a topic for discussion within the group
- Talk

- Call to the floor and collection of opinions on the subject
- Identification of the community's priority themes or problems
- Approaches to solving problems identified within clubs or communities
- Conducting village general assemblies/restitution of clubs under the responsibility of village authorities

4 Examples of debate topics

- Local consumption:
  - What is local consumption?
  - Why buy local?
  - What are the benefits for consumers and producers?
  - How do you choose local food?
  - What products should you eat for a healthy, balanced diet?
- Climate change
  - What do we mean by climate change?
  - Probable causes of this change
  - The consequences of this change
  - Preventive measures in general and in Est-Mono in particular

Resources mobilised

Physical resources: motorbikes; cameras; computers; local radios; outreach kits; work equipment

Human resources: facilitators; ECC members

Social resources: community leaders (mobilization of stakeholders); POs

Estimated costs per hectare

The estimated cost of implementing the practice is between FCFA 200,000 and FCFA 300,000. It takes into account the costs of setting up a 15-member ECC, running it on a theme and producing a radio programme on a theme. The costs of implementing the practice can be broken down as follows:

Activities	Business expenses	Types/Unit	Number/Unit	Unit cost	Total cost
Raising awareness	Travelling the presenter	Travel	2	3,000	6,000
	Communication	By card	1	5,000	5,000
	Support for the presenter	H/J	2	15,000	30,000
Setting up the CLC	Travelling the presenter	Travel	1	3,000	3,000
	Support for the presenter	H/J	1	15,000	15,000
Leading the CLC	Travelling the presenter	Travel	1	3,000	3,000
	Communication	By card	1	5,000	5,000
	Travel of CLC members (living outside the village or venue)	Travel	10	2,000	20,000
	Nutritional support for members	H/J	30	2,000	60,000

Activities	Business expenses	Types/Unit	Number/Unit	Unit cost	Total cost
Leading the CLC	Production of activity sheets	Per person	15	500	7,500
	Purchase of kits for events	Per person	15	500	7,500
	Purchase of work equipment (khaki blanket, markers, tape, etc.)	Package	1	6,000	6,000
Animation de l émission	Hosting the show	Cost of issue	1	30,000	30,000
	Travelling the presenter	Travel	2	3,000	6,000
	CLC members travelling to the show (3 people)	Travel	3	5,000	15,000
	Communication	By card	1	5,000	5,000
	Travel of CLC members (living outside the village or venue)	Travel	3	5,000	15,000
	Support for the presenter	H/J	1	15,000	15,000
Total cost					**234,000**

NB: It should be pointed out that costs (especially travel costs) vary according to the distances and areas in which the ECCs are located. The travel costs taken into account here are the minimal costs. Radio service costs also vary from one radio station to another.

Results obtained

Physical results

- 210 producer members of the CLCs and their respective families are more familiar with and/or have developed their knowledge of agroecology and more responsible production methods
- Some 251,500 listeners of the three (03) partner radio stations (Cosmos, Tchamba and Tchèkèlè sport FM) are being made aware of agroecological practices, climate change, etc.
- CLC members have become aware of the importance of reforestation. In addition to the woodlots (created by the women of the CLCs with the support of the men), the members have themselves initiated reforestation actions in their localities, not just in the fields, but also around their homes

Economic impact

- The adoption of agroecological practices through CLCs will have an impact on production, which in turn will have an effect on jobs and incomes

Social impact

- This practice has helped to improve access to information for producers. Although the project was carried out in three of the country's prefectures, it was publicised in 15 prefectures via local community radio stations
- Changes have been observed within existing social organisations, since the practice has helped to strengthen dialogue between different social groups (men, women and young people) and to raise awareness among all of the need to join forces in decision-making for community development initiatives. These changes can also be seen in the presence of women on certain decision-making bodies. Of the 59 women members of the CLCs, 28 are board members
- Changes in farming practices have been observed through the exchange of knowledge, dialogue and listening to the broadcasts. Other cooperatives not benefiting from the project have requested training from ProCEPA's peer cooperatives following the information on the radios and are trained in good agricultural practices and good phytosanitary practices by the ProCEPA cooperatives benefiting from this training. Training in the manufacture of organic fertilisers and biopesticides has been replicated in various localities outside the project's areas of intervention, and producers have adopted it in their fields
- Changes in eating habits and ways of thinking have been observed. Club members report having abandoned certain eating habits and adopted others, following the programme on the theme of "How to choose your food properly for better health". Neighbouring villages with no CLC decided to adopt the same rules after receiving information from their producer brothers and sisters
- The practice has boosted women's self-confiidence. They can freely express themselves and give their opinions on various subjects. They have initiated and/or developed income-generating activities. They have also become aware that the household budget should not be managed exclusively by the man

Environmental impact

- The environmental impact generated by the practice, without having been evaluated, can be considered positive insofar as the themes discussed in the CLCs and during the broadcasts are related to the attitudes and behaviour to be adopted for the protection of the environment

Innovative aspects

The new element introduced in the implementation of the practice, which shows its innovative nature, is the aspect of popularising and sharing information through radio, as this enables a large number of people to be reached

Implementation constraints and corrective measures

Implementation constraints	Corrective measures
Significant budget required to run the experiment	If the experiment is to be a success, it is necessary to ensure that the necessary resources are available. For the other aspects (non-education of members and socio-cultural and religious factors), awareness-raising campaigns accompanied by a judicious choice of beneficiaries can help to minimise their negative impact
Less availability of CLC members, who are often busy working in the fields	
Low level of education among members, which prevents them from fully understanding certain aspects and concepts related to the issues under discussion	
Socio-cultural and religious difficulties linked to gender in certain environments where women have virtually no right to speak in the presence of men	

Potential for adoption

The potential for the adoption of CLCs in West Africa is significant. These clubs offer an essential platform for promoting community participation, strengthening communication and fostering the sharing of knowledge within communities. The elements that need to be put in place to ensure that this practice is sustainable and replicable are organised local bodies (CCDs, CVDs, special committees, organised groups, etc.) within the target areas, which will be responsible for perpetuating or replicating the CLCs in other localities.

The members of the CLCs are motivated and enthusiastic about continuing the community listening activities, but the problem that remains is the cost of paying for the radio programmes and their rebroadcasts.

Dialogue, information, exchange and sharing of knowledge have a direct impact on changes in farming practices and in people's daily lives.

Challenges and prospects for scaling up

- Raising awareness and mobilising communities around ECCs
- Set up organised local bodies (CCDs, CVDs, special committees, organised groups, etc.) in the target areas, which will be responsible for perpetuating or replicating the CLCs in other localities
- Develop effective and adaptable CLC models that can be replicated in different communities while taking account of local specificities
- Provide in-depth training for ECC members on communication skills, group management, information gathering and dissemination, and relevant thematic areas
- Work with local organisations, government authorities, NGOs and other key players to obtain institutional, financial and technical support for setting up CLCs in communities and managing emissions
- Integrate ICTs, such as mobile phones, social networks and online platforms, to facilitate the gathering and dissemination of information, and to strengthen the commitment of community members

Testimony

"These exchanges between producers have led many of us to adopt agroecological practices"

"My name is Agboto Kodjo and I come from the village of Kpéssi, Nyamassila canton, East Mono prefecture in the Plateaux region. I am an agricultural producer and a member of the "Mokpokpo" group, of which I am the secretary.

Despite the extension work carried out by state and private technical advisory services, we knew little about most good agricultural practices for sustainable land management. In fact, we took little interest in these operations. We continued to manage our land in the usual way, using practices inherited from our ancestors.

Then the Projet d'appui à la consolidation et à la mise à l'échelle des pratiques agro-écologiques dans les régions des Plateaux et Centrale (ProCEPA) came to the village and encouraged us to set up Community Listening Clubs (CLCs). Within these CLCs, we meet regularly to discuss the problems (low yields, poor soil, lack of a market, etc.) that prevent us from making a good living from our farming, despite our best efforts. These exchanges between producers have led many of us to adopt agroecological practices, in particular the use of organic fertilisers and pesticides instead of synthetic chemicals. By taking part in these discussion sessions within the CLCs, I have strengthened my public speaking skills and my ability to think and analyse.

As a result, I was appointed to host a radio programme on agroecological practices on Tchêkêlê Sport Fm radio, with the aim of spreading the message far and wide in the Plateaux Prefecture, the agroecological practices already discussed in the CLCs. The approach, using producers to broadcast messages on the radio about the practices and their own experiences, both successful and unsuccessful, has reached a large number of people in the farming community and won them many fans.

Since becoming involved in the activities of the community listening clubs, I have reaped many benefits. In fact, as well as making me popular and providing me with employment, the application of the agroecological practices conveyed in the exchanges or implemented in the fields of my producer peers has enabled me to improve my crop yields and now have a safety stock of maize and beans to feed my household. I hope that this radio programme on agroecological practices, which is in danger of being discontinued for lack of funding, can continue so that it can continue to spread"

To find out more

The Community Listening Clubs (CLC), a means of amplifying the message and encouraging the adoption of agroecology. ECOWAS. 5'.
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Community listening clubs, a springboard for action in rural areas. FAO. 58 p.
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Community Listening Groups: Extending the reach of the MAHEFA behaviour change empowerment strategy. JSI Research & Training Institute. 4 p.
https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=16880&lid=6

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BP15: Participatory Guarantee Systems (PGSs) for certifying products

Presentation of best practice

participatory guarantee systems

Type	Scale	Crops	Location	Agro-climatic zone	Period
			 Prefecture of Tône (City of Dapaong) and Prefecture of Cinkassé (04 Cantons), Togo	Sudanian climate	07/19 – 06/22

Participatory Guarantee Systems (PGSs) are local schemes based on mutual trust, the active participation of stakeholders (producers, consumers, etc.) and shared principles, used to certify products that comply with specific standards. In the case of agroecology, they certify local agroecological products and improve producers' incomes.

Type: Corporate and financial
Scale: Landscape
Type of crops grown: All crops
Promoted by: RAFIA (Research-Support and Training for Self-Development Initiatives), UROPC-S (Regional Union of Cereal Producers' Organisations of the Savanes region), SAM (Millennium Synergy of Action) as part of the "Intensification durable des pratiques agroécologiques dans la région des Savanes (IDPA-S)" (RAAF/ECOWAS funding, with support from AFD)

Context of the experience

In the Savanes region of Togo, it is difficult to differentiate on the market between products produced using agroecological practices and those conventional agriculture. Both categories of product are therefore sold at the same price, which discourages agroecological producers who are making an extra effort to offer healthier products to consumers. This situation often leads them to abandon agroecological practices in favour of conventional ones.

To remedy this problem, the NGO RAFIA and its partners have set up a local certification system for agroecological products. This system makes it possible to distinguish these products on the market, giving them better value and fairer prices. This is a real source of motivation for producers committed to agroecology.

The experimentation of Participatory Guarantee Systems (PGSs) guarantees agroecological producers better prices and the possibility of having their production pre-financed by consumers.

Problems the practice is intended to address

- Lack of differentiation and failure to promote local agroecological products on the market
- The low incomes of farmers who practise agroecology

Objective: Stimulate the adoption of agroecological practices by rewarding the extra effort made by producers

Beneficiaries: rural producers and processors
The project involved 69 producers and processors.

Implementers and roles

- **NGO**
- **Producer organisation**
- **Agricultural training centres, decentralised government technical services and support structures**
- **Local authorities**
- **Firm with expertise in implementing the PGSs system**

Stages of implementation

Workshop and stakeholder consultation meetings

The stakeholders involved in setting up the PGSs met to enhance their knowledge of PGSs and encourage their active participation in the process of setting up and sustainably managing the system

Individual interviews

Ana-Bio conducted in-depth discussions with local authorities (prefecture, town hall) and decentralised government technical services (Regional Directorates of Agriculture, Health, ICAT and ITRA) to define the operation and governance of the PGSs in the Savanes region.

Development of the PGSs guide

The information gathered during the workshop and individual interviews enabled Ana-bio to draw up a PGSs certification guide tailored to the region. This guide was validated at a workshop attended by all the players involved.

Setting up the Local Certification Committee (LCC)

Made up of 15 people (producers, processors, distributors, consumers, technical services and support structures), the LCC is responsible for certifying the products of agroecological operators (producers, processors and distributors) who request it.

Capacity building at the LCC

Ana Bio provided training on PGSs management tools to members of the LCC.

Certification process for agroecological products

Product certification costs the operator FCFA 7,000, renewable every 3 years. It follows the procedures below:

- Agroecological operators wishing to certify their products submit an application to the LCC
- The LCC carries out an initial check to verify the accuracy of the information provided by the operator
- The LCC then visits the operator's activities in the field
- The LCC may or may not award the certificate to the operator on the basis of the findings made
- The LCC also offers technical and managerial capacity building for certified operators.

Setting up a sales outlet

The sales outlet serves as a showcase for certified products. The prices charged are on average 10% higher than those for conventional products. At the point of sale, 5% of sales go back to the agroecological operators and 5% is allocated to running the outlet.

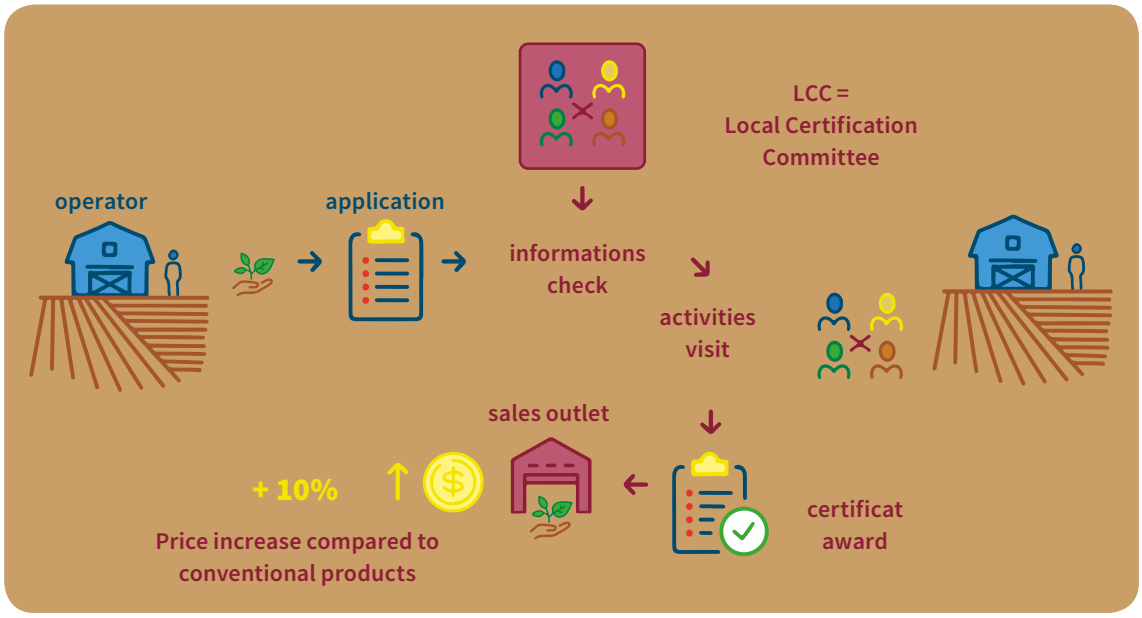
Resources mobilised

Physical resources: 2 motorbikes for LCC members to travel to visit the facilities of operators who request them; PGSs labels for labelling certified products

Human resources: 1 consultancy firm to lead the process of setting up the PGSs; technical services and support structures, operators (producers, processors, distributors and consumers) to form the LCC

Estimated costs per hectare

Cost category	Cost (FCFA)	Cost category	Cost (FCFA)
Cost of preparing and validating the PGSs guide		**Cost of capacity building for CICL members**	
Fees paid to the firm for support in drawing up the guide	1,500,000	Cost of training for LCC members (participants' travel, lunch breaks, training materials)	468,500
Stakeholder consultation and awareness-raising workshop for the implementation of the PGSs (travel for participants, lunch breaks)	1,379,600	Cost of organising an SPS experience-sharing visit to Benin	2,895,657
Workshop to validate the PGSs guide and set up the LCC (participants' travel, lunch breaks, teaching materials	910,000	**Cost of operating and maintaining the system**	
		Annual cost of running and organising stakeholder consultation meetings to steer and monitor the PGSs	983,936
		Cost of certification per producer for a period of validity of three years	150,000
		Total estimated cost	**8,287,693**



How agroecological product certification works

Results obtained

Physical results

- 69 agroecological operators (producers and processors) have had their products certified under the system
- Income increase of around 5% on average for agroecological operators

Economic impact

- Job creation: development of two organic input production cooperatives to meet the growing need for organic inputs by agroecological producers. These two cooperatives employ 36 people (their members), including 10 women, and in 2022 generated sales of 672,000 CFA francs and 820,000 CFA francs respectively. The sales outlet for certified agroecological products has also recruited a young woman to manage it, and achieved a turnover of 426,000 FCFA in 2022
- The strong involvement of women and young people in the PGSs process reinforces the national and local dynamic of integrating women and young people into decision-making bodies. In fact, when the LCC was set up, more than half of its members were women and young people
- The gradual and widespread integration of agroecological practices into production systems in the project area. More than 500 producers have expressed to the project team their desire to learn agroecological practices and have their products certified

Environmental impact

- The environmental effects have not been demonstrated. However, with the increased use of organic inputs recommended in agroecological practices, positive environmental effects can be expected (reduced air and water pollution with less use of synthetic inputs, improved physico-chemical characteristics of soils, etc.)

Innovative aspects

- The environmental effects have not been demonstrated. However, with the increased use of organic inputs recommended in agroecological practices, positive environmental effects can be expected (reduced air and water pollution with less use of synthetic inputs, improved physico-chemical characteristics of soils, etc.).

Implementation constraints and corrective measures

The main difficulty that has hampered the development of the practice is the poor sales of agroecological products at the point of sale. This is due to insufficient communication and limited consumer awareness. In addition, there have been occasional shortages of supplies of agroecological products, compromising customer loyalty.

To alleviate these difficulties, it would be necessary to:

- Strengthen communication and visibility around the point of sale for agroecological products
- Increase the number of points of sale, particularly in collaboration with public bodies such as town halls
- Intensify awareness-raising campaigns to better inform consumers about the benefits of agroecological products
- Improving access to water for producers, in order to stabilise and secure supplies

Potential for adoption

There is a strong demand for certification of agroecological products from beneficiaries, but also an increase in demand for agroecological products from consumers. More than 500 producers who have not benefited from the project have expressed a desire to try it out.

Challenges and prospects for scaling up

- Increase awareness of the PGSs label among stakeholders, particularly consumers
- Increase the number of points of sale for agroecological products and set them up in accessible locations such as local markets, town halls or community centres
- Identify sustainable funding to ensure the operation of local certification committees
- Encourage harmonisation of PGSs standards and procedures at national and regional level

Testimony

"Certification under the PGSs label has increased the market value of the tomatoes I produce"

"My name is Kangba Goumba, I'm 43 years old and I come from the village of Kpong, in the Canton of Kourientré (Prefecture of Tône, Savanes Region). As a member of a producers' cooperative, I received support to obtain PGSs certification for my tomatoes, grown on a 0.5 hectare plot.

Before the PGSs was introduced, my efforts seemed to be in vain: my tomatoes weren't selling well, prices weren't very lucrative, and I was discouraged by the frequent losses due to rot. At times, I was even thinking of abandoning agroecology in favour of conventional methods. Thanks to the IDPA-S project and the support of a specialist consultancy, we were able to certify our products under the "Participatory Guarantee Systems (PGSs)" label. This certification has given new value to our tomatoes. Today, they are processed and preserved in jars for several months (up to a year), which increases their durability and attractiveness.

With this certification, we can sell canned tomatoes under the name of our cooperative at more attractive prices, between 300 FCFA and 1,000 FCFA depending on the volume. What's more, the shop set up by the project makes it easier to market them. Thanks to the income generated, I can reinvest in other farming activities and contribute to my family's needs.

PGSs certification has really transformed my production and my economic opportunities."

To find out more

Guide to certification under the Participatory Guarantee Systems (PGSs). Conseil national de l'agriculture biologique (CNABio) in Burkina Faso.
https://www.cnabio.net/le-biospg/guide-de-certification-selon-le-spg/

Participatory guarantee systems, a certification model worth (re)discovering. CIRAD.
https://www.cirad.fr/les-actualites-du-cirad/actualites/2022/certification-par-systemes-participatifs-de-garantie

Organic PGSs, a participatory system for accessible organic products from Burkina? CNABio. 12'15".
https://www.youtube.com/watch?v=RdNHR4_QaQE

Mali: Organic farming and PGSs certification. AMSD (Mali). 16'50".
https://www.youtube.com/watch?v=j6q7bjpM7Hk

Roppa-Pafao-Jafowa online discussion from 24 March to 13 May 2022 on "Participatory guarantee systems in West Africa". 5 p.
https://www.alimenterre.org/system/files/2022-08/1314-pafao-discu-11-contributions-spg-cdr.pdf

Interview: Certification in Benin, an important step towards scaling up. CFSI. 4 p.
https://www.alimenterre.org/la-labellisation-une-etape-importante-pour-le-passage-a-l-echelle

The participatory guarantee system: a relevant solution in Burkina Faso?, Idrissa Nacambo, 2020.
https://www.chaireunesco-adm.com/Idrissa-Nacambo

Guaranteeing the quality of agroecological products on the market: the PGSs approach of the Fifata group in Madagascar. FERT.
https://www.fert.fr/garantir-la-qualite-des-produits-agroecologiques-sur-le-marche-la-demarche-spg-du-groupe-fifata-a-madagascar/

Presentation of the SPG agroecology label in Morocco. RIAM.
https://reseauriam.org/systeme-participatif-de-garantie-spg

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Section B. Other testimonies

OT1: Utility trees to restore the general vegetation cover

Promoted by: NGO AMEDD, Coopérative Sènèyiriwaton and the rural commune of Kiffosso1 as part of the "Agroecological intensification and sustainable management of natural areas and resources (IAE)" project (PATAE/RAAF funding)

Location: 13 villages in the rural commune of Kiffosso 1 (Sikasso region), Mali
Period: August 2019 – June 2022

"I'm amazed by the change in the landscape of my community and I'm proud to have contributed to it"

My name is N'Gou Goïta, from the village of Kiffosso 1 in the rural commune of the same name. As a farmer, I was confronted with deforestation and the degradation of ecosystems. Before, we planted trees of different species without any particular monitoring. After raising awareness among producers and identifying candidates, the project provided us with seedlings purchased from local nurseries.

This was followed by practical training for the beneficiaries by agents from the Water and Forestry Service. From then on, everyone was responsible for planting their own seedlings in their fields under the supervision and monitoring of the Water and Forestry Service and AMEDD agents. Thanks to all this support, I was able to improve my knowledge and skills in tree planting (setting up nurseries, preparing the sowing substrate, pre-treating the seeds, knowing the ideal time for transplanting).

To date, I'm delighted with the improvement in the plant cover of my fields and, beyond that, of the entire rural commune of Kiffosso 1 with different agroforestry species. In view of the initial results, I remain motivated to restore the plant cover in order to improve our living environment.

OT2: Production of forage resources in mixed crop-livestock farming systems

Promoted by: UPPA/H (Houet Provincial Union of Agricultural Professionals) ; INERA (Institute for the Environment and Agricultural Research) ; CIRAD (Centre for International Cooperation in Agricultural Research for Development) and GCBF (Green Cross Burkina Faso), within the framework of the project "Amélioration de la production et de l'efficience d'utilisation de la fumure organique dans les systèmes de production à l'Ouest du Burkina Faso (APEUFO)" (PATAE/RAAF funding)
Location: Communes of Béréba, Bobo-Dioulasso, Dandé and Djigouèra (Hauts-Bassins region), Burkina Faso
Period: July 2019 – June 2022

"I'm so convinced of the benefits of producing fodder on my farm that I've set aside 1.5 hectares for the purpose"

I'm Tall Ali, a livestock farmer living in the village of Kassanga, and a member of the agro-pastoralist group in the Commune of Djigouèra. I rear cattle and small ruminants. During the dry season, feeding my animals was an ordeal: they withered, some died, and I could no longer send them on transhumance because of the insecurity. I was often forced to sell a few head of cattle to buy feed supplements such as bran and oil cakes, which had become very expensive.

Thanks to the APEUFO project, I have been helped to produce fodder from dual-purpose sorghum and cowpea seeds, and to develop balanced feed rations for my livestock. I set aside 1.5 hectare of my farm for this production — a practice that was once unimaginable for my parents. Since I've been growing fodder, my animal feed costs have gone down, my income has gone up, and I have access to sorghum and cowpea seeds to feed my family. Some members of the group are even able to sell their surpluses. The fodder produced enables me to feed my animals from the end of the rainy season until the dry season.

The main constraint today is the scarcity of forage seed. Although the group's managers are organising to order early, the stocks available are still limited. Despite this difficulty, I'm convinced of the importance of this practice, which allows me to be more autonomous, preserve the health of my animals and better manage the resources on my farm.

OT3: Intercropping to control pests

Promoted by: NGO THP-SN, S2ATA (UGB-St louis), ASPSP as part of the project Intensification agroécologique et valorisation des produits des exploitations familiales (PIAVPEF) (PATAE/RAAF funding)

Location: Commune of Guédé chantier-garden of the former ENDA genetic resource centre (Podor department), Senegal
Period: July 2019 – June 2022

"I've seen a lot of results in terms of the performance of my crops thanks to combined cropping"

My name is Salamata PAME and I come from the village of Guédé Chantier, in the department of Podor, in the Saint-Louis region of Senegal. I'm a member of GIE Timtimol Ndéma and I've been a farmer leader for over ten years, committed to the agroecological cause. I grew up in an agricultural environment marked by the massive use of fertilisers and, above all, dangerous pesticides. These products have caused serious illness and even death in my family and friends. This situation prompted me to get involved in promoting healthy agriculture, first with ASPSP, then with projects run by NGOs such as ENDA Tiers Monde, where I was trained in organic farming.

When the PIAVPEF project was launched in my village, I was appointed focal point and relay facilitator. Working with ASPSP and students from Gaston Berger University, we adopted the Vision Engagement Action (VEA) approach to define a shared vision. We decided to promote agroecological practices to improve productivity without resorting to chemical products. A community garden has been set up as a training ground for experimenting with different techniques. I discovered crop association, a new practice for me, which involves combining certain crops to combat pests naturally. I received training in how to choose the right complementary species for biological control, as well as inputs (chillies and green onions) to test this approach. Although it required more technical skills and labour at the beginning, the results have been very positive.

I observed very few pest attacks on my chilli plants. I found dead insects on the stems of the green onions. I didn't apply any pesticides or even biopesticides throughout the growing cycle. At harvest time, as well as chillies, I was also able to produce organic green onions, which improved my income. The use of compost improved soil fertility and yields. Encouraged by this success, I experimented with a groundnut-sweet potato combination. Although this combination doesn't combat pests directly, it is effective in limiting weed growth, as the sweet potato covers the soil. These combinations enable me to produce healthy vegetables at a better price than those grown conventionally. But it's still difficult to find customers willing to pay more, which highlights the need for project support to access suitable markets.

OT4: Beneficial indigenous microorganisms (BIM) to accelerate the decomposition of soil organic matter

Promoted by: IECD (European Institute for Cooperation and Development), CIRAD (Centre for International Cooperation in Agricultural Research for Development) – PCOPMAYA (Collaborative platform for Yamoussoukro market garden producers) as part of the Agroecological Transition of Market Gardeners in Côte d'Ivoire project (TAMCI) (PATAE/RAAF funding)
Location: Yamoussoukro, Ivory Coast
Period: July 2019 – June 2022

"The results I get from using Beneficial indigenous microorganisms (BIM) make me forget the effort it takes to make them"

My name is Nonman Franck Elvis, and I'm a market-gardener in Ballakro (Yamoussoukro). I used to grow conventional crops on a plot of 0.75 ha, but the exhaustion of my soil meant that I had to increase the doses of fertiliser over the cycles until I had to leave the land fallow. The TAMCI project gave me access to MIB, compost, biopesticides and crop diversification. As a farmer, I've also started using poultry droppings, but they decompose slowly, unlike chemical fertilisers

The manufacture and introduction of MIBs, learnt during the project's training courses, has been a real solution, as they significantly speed up the decomposition of organic matter. Inexpensive (around 10,000 FCFA) and simple, it nevertheless requires patience and rigour. As part of my agroecological transition, I have gradually abandoned chemical products in

favour of biopesticides and organic fertiliser. The necessary elements are available in nature, which considerably reduces production costs.

Today, my costs have fallen sharply and my crops are showing good vegetative condition and better yields. The results obtained more than compensate for the effort required to prepare the MIBs, and I'm convinced of their lasting effectiveness.

To find out more:
Production of Beneficial indigenous microorganisms (BIM) in Côte d'Ivoire. IECD. 10'01''.
https://youtu.be/49xhEBKhfg4
Use of Beneficial indigenous microorganisms (BAM) in Côte d'Ivoire. IECD. 4'35''.
https://youtu.be/FHG9wesamqo
Technical sheet: Beneficial indigenous microorganisms (BIM). IECD. 3 p.
https://mesecops.araa.org/document/projects/46/FT_IECD_MAB.pdf
Technical sheet: Biopesticides. IECD. 12 p.
https://mesecops.araa.org/document/projects/46/FT_IECD_Biopesticides.pdf
Technical sheet: Compost. IECD. 2 p.
https://mesecops.araa.org/document/projects/46/FT_IECD_Le%20compost.pdf

OT5: Participatory selection of lowlands to ensure the sustainability of land improvements

Promoted by: Consortium ETD (Enterprise, Territory and Development), CPC (Central Cereal Producers)-Togo and OADEL (Food and Local Development Organisation) as part of the "ProCEPA" project to consolidate and scale up agroecological practices in the Plateaux and Central regions (PATAE/RAAF funding)
Location: Central and Plateaux regions, Togo
Period: July 2019 – June 2022

"Summary and participatory management of lowlands, an approach that reassures rice growers and fosters emulation"

I am Madougnitou Essotom (50), married with 8 children. I'm a rice and maize farmer and President of the Union of Cereal Producers' Organisations (UOPC) of Titigbé in the Sotouboua Prefecture (Central Region). We grow a lot of rice here, but were faced with two major problems: i) the degradation and erosion of the low-lying areas, which were unable to retain rainwater, and ii) the difficulties of choosing the sites to be developed by consensus, because of the risk of expropriation without compensation and the subsequent problems of exploitation. Given these difficulties, ProCEPA decided to support us by adopting a participatory approach to summary development, preceded by preliminary surveys. Our lowland was thus identified and developed over an area of around 2 ha, and was used as a demonstration and learning plot for agroecological rice production techniques. I also benefited from small working equipment (hoe, cutter, bucket, etc.), rice seed (variety IR841) and training on making and using compost, transplanting rice, etc.

Today, I'm very proud of the participatory approach I've used, because doubts about land ownership on my site have been cleared up and there's renewed enthusiasm for rice production. What's more, my rice yields have doubled (3 tonnes/ha) from 1.5 tonnes/ha on the no-till or transplant plots, with

compost added to the soil. This is a really relevant approach, and I would encourage anyone who wants to support us to adopt this participatory approach to lowland development from now on, to reduce the difficulties we have with land tenure and to develop larger areas for ourselves.

OT6: Mulching for better water management and weed and pest control

Promoted by: ONG THP-SN (*T*he Hunger Project Senegal), S2ATA (UGB-St-Louis, UFR of Agronomic Sciences, Aquaculture and Agrifood Technologies, Gaston Berger University, Senegal), ASPSP (Senegalese Association of Farmers' Seed Producers), as part of the project Intensification agro-écologique et valorisation des produits des exploitations familiales (PIAVPEF) (PATAE/RAAF funding)
Location: Communes Guédé (Podor department), Senegal
Period: July 2019 – June 2022

"By incorporating mulching into my growing techniques, I'm saving water and optimising my income by reducing production costs"

My name is Diouldé Ba and I live in Namarel, in the department of Podor. I grow market garden produce and livestock on a small 400 m^2 field where I mainly grow okra, chilli, aubergine, squash and peppers. The extreme climatic conditions in my village, which is located in a sylvopastoral zone, make watering expensive and restrictive, with watering twice a day with tap water, which increases my production costs and takes up all my time.

In 2020, I took part in an awareness-raising event organised by The Hunger Project Senegal on the harmful effects of chemicals. I was then trained in agroecological practices such as mulching, composting and making biofertilisers. With the support of students from the Université Gaston Berger, I corrected my past mistakes with mulching and improved my method: emphasis on better quality straw, appropriate thickness, combination with compost from my sheepfold.

Since then, I've been watering less often — once a day, or even every other day — and the soil stays moist under the mulch. My field is less weedy, my costs have gone down, and I have more time for other activities, such as a small business. I now sell my vegetables at a better price (500 FCFA for a kg of okra compared with 300 FCFA at the most before). Despite a few constraints linked to the availability of straw and the risk of attacks, the benefits are clear, especially in terms of saving water. A drip irrigation system would further enhance the results.

Mulching is simple to use and requires no special technical skills, but it is still difficult to obtain straw, which is often used for livestock. Certain types of straw can also cause damage to crops. Despite these constraints, the advantages, particularly water savings, are undeniable. The ideal solution would be to combine it with a drip irrigation system for even greater efficiency.

To find out more:
Mulching in Côte d'Ivoire. IECD. 4'19''.
https://youtu.be/-5GAtILIh7M
Technical sheet: Mulching. IECD. 2 p.
https://mesecops.araa.org/document/projects/46/FT_IECD_Le%20paillage.pdf

OT7: Biofunctool, a tool for instant, low-cost monitoring of soil health

Promoted by: Terre Verte, GRET, IRD (Development Research Institute), AZN (Zoramb Naagtaaba Association), la Trame, as part of the project "Le bocage sahélien en partage (BSP)", (PATAE/RAAF funding)
Location: Tankouri woodland perimeter (village of Guiè, rural commune of Dapélogo; Plateau Central region), Burkina Faso
Period: July 2019 – June 2022

"Thanks to the Biofunctool, we can rest assured that our landscaping efforts have not been in vain"

The pilot farm run by the Zoramb Naagtaaba Association (AZN), which has been specialising in Sahelian bocage farming for thirty years, has been developing bocage areas since 1995. As part of the Bocage sahélien en partage (BSP) project, those in charge wanted to have access to scientific data to assess the relevance of bocage management in terms of recovering soil fertility. Until then, the farm had no means of measuring this.

Thanks to a partnership with GRET and Terre Verte, the pilot farm has adopted the Biofunctool agroecological evaluation tool to assess soil fertility. Financial resources made it possible to carry out the sampling and analysis on a participatory basis, with staff being trained in the use of the tool. This co-construction approach was facilitated by good communication between researchers and the field team, limiting the difficulties encountered.

The results show that soil management practices in the bocage areas are effective in restoring the soil. The tool has

produced clear and accessible data, reassuring the farm about the impact of its actions. Although some data is still lacking, particularly on soil fauna, the Biofunctool has met a key expectation of the pilot farm.

OT8: Ciné Yam, sahelian farmers documentary filmmakers

Promoted by: Terre Verte, GRET, IRD (Development Research Institute), AZN (Zoramb Naagtaaba Association), la Trame, as part of the project "Le bocage sahélien en partage (BSP)", (PATAE/RAAF funding)

Location: Village of Guiè, Commune of Dapélogo, Central Plateau region, Burkina Faso
Period: July 2019 – December 2022

"Thanks to Ciné Yam, I've been able to improve the way I work and fertilise my land"

My name is Paul Sawadogo, from the village of Bendogo, in the commune of Guié, and a member of the Pasgo perimeter landholding group. As an agricultural producer interested in innovation, I used to practise zaï and composting in the traditional way. Despite my efforts, rainwater washed away the soil and the manure, and my yields remained low, especially in times of drought.

After attending a screening of Ciné Yam organised by AZN, I discovered new techniques. At my request, an AZN facilitator helped me to replicate the experiments described in the films: improved zaï following the slope of the land, composting and crop maintenance. Despite constraints such as soil encrustation when making zaï and the lack of manure for composting, I achieved remarkable results.

My production has risen from around ten to thirty bags per hectare. My household is now self-sufficient in food, and I sell the surplus to cover school, health and clothing costs.

Find out more about the BSP project:
Le Bocage sahélien en partage in Burkina Faso. NGO Terre Verte. 26'25''.
https://youtu.be/mzj2tNals7E

OT9: Village savings and loan associations (VSLA) to support the resilience of small family farms

Promoted by: ACF (Action contre la faim) ; UPPA (Provincial Union of Agricultural Professionals of Tapoa) ; Association BEO-NEERE ; CREAF/INERA (Environmental Research and Training Centre of the Institute for the Environment and Agricultural Research), as part of the "Projet d'appui à la transition agroécologique dans la région de l'Est du Burkina Faso (PATEB)" (PATAE/RAAF funding)
Location: Tapoa province (Eastern Region), Burkina Faso
Period: July 2019 – June 2022

"Village savings and loan associations (VSLA), a solidarity tool that has changed our lives"

We are Sagna Amadou and Tankoano Nano, from Sector 3 in the town of Diapaga. Our income depends mainly on agriculture, but due to a lack of means to acquire equipment and inputs, our situation remained precarious and discouraging. Two years ago, thanks to a suggestion from the Union provinciale des professionnels agricoles (UPPA) in Tapoa, we decided, along with other farmers, to set up an VSLA. In this context of insecurity, this tool based on solidarity and mutual aid was immediately appealing.

After taking a census of members, we set up a set of internal rules and an executive (1 chairman, 1 treasurer, 1 secretary and 1 controller). PATEB provided us with an operating kit, supplemented by locally collected materials. A fund was set up, and every week the contributions were collected by the treasurer, who presented the balance sheet. After a few months of contributions, we began to benefit from loans on terms (interest rate and maturity) previously defined in the internal rules. Several members were able to launch income-generating activities that improved their daily lives and those of their families.

After nine months, the cycle was completed, the loans and interest repaid, and the profits distributed in proportion to the amounts deposited, according to the deposit books. This experience has shown that the VSLA tool, properly structured and managed, can bring about lasting changes to our living conditions.

OT10: Integrating youth into agro-pastoral activities

Promoted by: Fondation Paul Gérin-Lajoie as part of the "Support for Agroecological Transition in Mali through Synecoculture (ATAMS)" project (PATAE/RAAF funding)

Location: Peri-urban (Ségou) and rural (Bla and MPessoba) areas, Mali
Period: July 2019 – December 2021

"Thank you to the ATAMS project, which has enabled me to be more autonomous, listened to and respected within my community"

My name is Mamourou Traoré, I'm 27 years old, and I'm a poultry farmer in Ségou, a graduate of the Ecole Secondaire Agro Pastorale (ESAP) in 2013. It was through ESAP that I applied for funding for the ATAMS project, which enabled me to make my dream of setting up an agropastoral business a reality.

The project first supported me as a trainee at the SAHEL-VETO pharmacy, then validated a business plan by financing 90% of the equipment (poultry farming integration kit: incubators, electric pump and accessories) and raw materials. It also trained us in business management and marketing. This support has enabled me to strengthen my technical skills (feed formulation, use of vaccines and medicines) and logistics, and to diversify my activities, particularly in market gardening and services with the incubator. My company now takes on trainees, whose contribution has been invaluable.

Although my clientele is still local, the outlook is promising with the cooperative structure and the aim of conquering other markets through group sales. There have been difficulties, particularly in selecting beneficiaries and implementing activities. But my determination, self-confidence, creative spirit and the constant support of the project leaders enabled me to overcome them.

OT11: Agroecological onions, a highly competitive product

Promoted by: NGO Eclosio, COOPAM/RESOPP, GRET, COOPEC-RESOPP, Producers' Organisations (Jam Bougoum in Pout Ndoff and Soukali Sunu Gox in Notto), ANCAR as part of the "Yessal Sunu Mbay: Assainir notre agriculture" (PATAE/RAAF funding)

Location: Arrondissement of Notto Diobass (village of Notto), commune of Notto and Pout Ndoff, commune of Tassette (Thiès Region), Senegal
Period: July 2019 – June 2022

"With my agroecological onion, I can keep the produce for as long as it takes to make the most of the market"

My name is Maguette Diouf, I'm 41 years old and I come from the village of Pout Ndoff, in the commune of Tassète, in the Thiès region. A tiler by profession, I used to work in Thiès while growing groundnuts and millet for the family and for sale. With the COVID-19 crisis, my activities came to an abrupt halt, leaving me with no income. As a member of the GIE Diame Bogom, I was given a 900 m² plot in a 3 ha community field set up thanks to the PARERBA/ENABEL project. I grew peppers, okra and onions in the conventional way, using chemical fertilisers and pesticides.

In 2021, the Yessal Sunu Mbaye (YSM) project taught us about and trained us in agroecological practices: making compost, using inoculated substrate, biopesticides based on papaya leaves and neem, integrating fertilising trees (Leucaena hedges), rotation, mulching, etc. The project also provided me with onion seeds and small equipment. The project also provided me with onion seeds and small equipment. I followed the technicians' recommendations to the letter. Since I've been growing agroecological onions, I've seen nothing but benefits: better quality and quantity, better conservation and lower operating costs because I no longer buy fertilisers or pesticides.

My current production is around 3.5 tonnes from 900 m², and I can sell agroecological onions at 250 FCFA/kg, or even more when the market is favourable, compared with 150 to 200 FCFA/kg for conventional onions. I can now keep my produce for several months, so I can wait for the right prices. Even though I'm doing well in this business, it's still vital that the project supports us in getting the most out of our products and making it easier to sell them on the market.

To find out more:

Agroecological onion production in Senegal. NGO Eclosio. 3'15''.
https://app.box.com/s/uj6nga7nzlcypj2xljxbhn7bq6gl51hk

Fiche de capitalisation : Production d'oignons agroécologiques. Eclosio. 2 p.
https://mesecops.araa.org/document/projects/50/YSM%204%20Production%20d%E2%80%99oignons%20agro-%C3%A9cologiques%20V2.pdf

Yessal Sunu Mbaay (YSM) project in Senegal. ONG Eclosio. 8'26''.
https://youtu.be/Q92khAdGhzI

OT12: Agroecological input credit (CIAE) to facilitate producers' access to inputs

Promoted by: Consortium SEPT (Solidarity Consortium for the Development of Togolese Farmers) : NGO CED (Centre for Ecology and Development), NGO CADI-Togo (Cooperation for the Support of the Integral Development of Togo) and MAP-TO (Togo Peasant Alliance Movement) as part of the project Promotion des exploitations familiales agroécologiques productrices du maïs et du soja pour des revenus durables dans la région des Plateaux au TOGO (PEFARD-TOGO) (PATAE/RAAF funding)
Location: Prefectures of Ogou (8 villages), Haho (7 villages), Moyen-Mono (5 villages) and Est-Mono (4 villages) (24 villages; Plateaux Region), Togo
Period: July 2019 – December 2022

"I would like to thank PEFARD, whose Agroecological input credit has revolutionised my life"

My name is Binessi Kokou, from the village of Sato Kopé, Akparé canton, Ogou prefecture in the Plateaux region. I am 34 years old and the secretary of SCOOPS KAGBEMA, a beneficiary of the PEFARD-TOGO project. In 2016, our village was among the first to receive agricultural loans, but failure to repay put us on the red list of financial institutions. Deprived of access to credit, we turned to the town's traders for loans to pre-finance our activities, on condition that we then sell our produce at low prices. This situation became unbearable, driving many young people to flee to Atakpamé or abroad.

The arrival of the PEFARD project has given us renewed hope. Thanks to a renewed partnership with the microfinance institution FECECAV, we were able to benefit from the Agroecological input credit (CIAE), which gives us access to

improved seeds and organic fertilisers on credit, repayable after the sale of agroecological crops. After two years of collaboration, I was able to access a family loan. I bought school supplies for my children, rented a house in Kara for my student son, and supported my wife's business. I also bought a motorbike to use as a taxi-moto to complement my farming activities.

This credit enabled me to specialise in agroecological farming, with products that are now sought after by export companies. Thanks to sales by the kilo, I make good margins. I bought a threshing machine and tarpaulins, which I hire out. Today, I'm listened to at community meetings, because I'm actively contributing to the development of my village.

OT13: Savings and credit groups (GEC) to help finance small family farms

Promoted by: Consortium ETD (Enterprise, Territory and Development), CPC-Togo (Central Cereal Producers) and OADEL (Food and Local Development Organisation) as part of the "ProCEPA" project to consolidate and scale up agroecological practices in the Plateaux and Central regions (PATAE/RAAF funding).
Location: Prefectures of Tchamba, Sotouboua and Est-Mono, Togo
Period: July 2019 – June 2022

"I'll never forget this GEC experience, which has enabled me to be financially independent and assert my role in my household"

My name is Pissang, from the village of Avakodja, in the Canton of Nyamassila, Prefecture of Est-Mono, Plateaux region. I produce cereals and market garden produce. Before, I couldn't get hold of farm inputs and equipment, as access to credit was very difficult. I had to resort to loan sharks, with exorbitant interest rates (between 40 and 60%), or sell my crops.

Since 2021, I have joined the daily tontines organised by the ProCEPA project within the "Femmes unies" GEC in Avakodja. Thanks to these activities, I obtained a loan of 60,000 FCFA (at 3% over three months) to buy and store maize. I bought two 100-plate bags at 250 FCFA each, which I then sold at the Nyamassila market at a profit of 50,000 FCFA. This money enabled me to pay for my eldest daughter's apprenticeship fees, school supplies for the other two, and to support my husband in his day-to-day expenses.

What I'm most pleased about is that, thanks to the GEC, I now have savings of over 80,000 CFA francs, which I'll get back with interest at the sharing meeting at the end of the cycle. I never thought I'd be able to save so much.

Section C. Summary of lessons learned and cross-disciplinary lessons

The capitalization of experiences from the fifteen pilot projects of the Agroecological Transition Support Project (PATAE) deployed in five countries (Burkina Faso, Côte d'Ivoire, Mali, Senegal and Togo) has made it possible to identify **major achievements** and **draw cross-cutting lessons learnt**, structured around **five key topics**:

- Land improvement and collective management of natural resources
- Production and use of bio-inputs (fertilisers and pesticides) for agroecology
- Diversification, intercropping and service plants
- Crop-livestock integration in agropastoral systems
- Valorization and commercialization of agroecological products

Topic 1: Land improvement and collective management of natural resources

Achievements

Actions to improve the land and collectively manage natural resources have sought to respond to the many challenges posed by the increasing degradation of land, the scarcity of resources and inequalities of access, particularly for women and young people.

The physical improvements made — such as **contour lines, stone barriers, filter dikes and lowland drainage techniques** — have significantly improved water infiltration, helping to **reduce water erosion** and recharge the water table. These systems have **restored soil fertility**, reduced water stress on crops and, as a result, increased crop yields. In the case of Mali, maize yields have doubled, while an average 10% improvement in yields has been recorded for all crops, testifying to the relevance of the interventions carried out by FPGL (Mali) and AMEDD (Mali).

In economic terms, improved soil productivity and reduced losses due to erosion have led to an increase in farm income. Localised weeding, promoted by UPPA-HOUET (Burkina Faso), has halved the amount of labour required, freeing up time for income-generating activities (small trade, agricultural services, etc.). This **rationalisation of labor** represents a powerful lever for improving farmers' living conditions.

In social terms, these initiatives have led to greater inclusion of young people and women. Securing land tenure for women, through the allocation of titles or the formalisation of land agreements, has enabled them to access developed market garden areas, contributing to their economic empowerment. The **participatory approach** adopted in several projects, notably for the concerted development of lowlands with RAFIA (Togo) and UROPC-S (Togo), has strengthened social cohesion and prevented conflicts over land use.

Finally, the environmental effects are significant. The reduction in the use of chemical fertilisers, the promotion of agroforestry species (*Vitellaria paradoxa, Parkia biglobosa*, etc.), and the reconstitution of plant cover all contribute to the restoration of degraded ecosystems, carbon sequestration and the preservation of biodiversity.

Lessons learnt

Firstly, **the effectiveness of development projects depends on their being part of a collective dynamic**. The support of local communities, customary authorities and vulnerable groups is a prerequisite not only for the effective implementation of structures, but also for their maintenance and sustainability. When well managed, the participatory approach encourages ownership of the systems, limits conflicts and strengthens local social capital.

Secondly, **the combination of simple, inexpensive and reproducible techniques has proved effective in improving the resilience of agroecosystems**. The choice of techniques (stone barriers, localised weeding, bunds, etc.) needs to be contextualised and adapted to the specific agro-climatic and socio-economic features of the intervention zones. Implementation by experienced organisations such as FPGL (Mali), AMEDD (Mali) and RAFIA (Togo) has ensured that the methods are adapted to suit.

Thirdly, **securing land tenure for marginalised groups is a decisive factor in the sustainability of developments**. Without guaranteed rights of use, women and young people remain excluded from the dynamics of agroecological intensification. The process of allocating or formalising access to land must therefore be incorporated into project design from the outset.

Fourthly, **the link between development and job creation for young people needs to be strengthened**. Experiences with the creation of local economic interest groups specialising in development work (as observed in Mali with the support of AMEDD) show that support for the professional structuring of these players can generate sustainable employment opportunities.

Finally, scaling up requires a long-term approach based on a number of conditions: **training producers to maintain the facilities, institutional recognition of the systems through their integration into local development policies, and strengthening the support systems** (farm advisory services, access to equipment, financing).

Topic 2: Production and use of bio-inputs for agroecology

Achievements

Faced with the high cost of chemical fertilisers and their negative effects on the environment and human health, the promotion of organic fertilisers and pesticides has aroused a great deal of interest among producers.

Supporting farmers in making compost, bokashi, improved manure and biopesticides has **reduced production costs and improved soil fertility**. In Burkina Faso, UPPA-HOUET has demonstrated the effectiveness of making compost in pits and heaps, while increasing the capacity for self-production of organic inputs. This technique has led to a 60% reduction in the use of chemical fertilisers on the farms supported.

In the field of plant protection, the use of **neem-based biopesticides and beneficial indigenous micro-organisms (BIMs)**, promoted by AFDI in Côte d'Ivoire, has made it possible to limit pest infestations in vegetable and cereal crops. At the same time, the production and use of fermented liquid fertilisers (mixtures of cow dung and urine enriched with local plants) have produced significant results in terms of stimulating crop growth and reducing foliar diseases.

From an economic point of view, access to bio-inputs has strengthened the autonomy of farms. The RAFIA project in Togo has encouraged the introduction of **community-based production systems**, reducing dependence on imported synthetic inputs. The pooling of resources and know-how has increased the adoption of these practices.

Finally, from an environmental point of view, the adoption of biofertilisers and biopesticides has limited soil and water pollution, while helping to maintain soil biodiversity.

Lessons learnt

Firstly, **the acceptability of bio-inputs depends very much on their visible and immediate effectiveness**. Technical support for farmers, particularly via agroecological field schools (as set up by UPPA-HOUET in Burkina Faso), has proved essential to ensure that new practices are adopted.

Secondly, **access to local raw materials is a determining factor**. The effectiveness of composts and biopesticides depends on the availability of basic ingredients (dung, crop residues, neem leaves, etc.). In areas where these resources are scarce, their large-scale production becomes a challenge. Coordination between producers, breeders and local authorities is needed to ensure a regular supply.

Thirdly, **the distribution of bio-inputs relies on collective structuring mechanisms**. The experience of RAFIA (Togo) has shown that organising producers into groups encourages the production and distribution of bio-inputs at lower cost, while ensuring that farmers become more skilled. The development of local labels or certifications could also boost the recognition and adoption of these products.

Finally, to ensure successful scaling-up, it is vital to integrate these practices into public agricultural policies. **The integration of bio-inputs into agricultural extension services, their recognition by technical services and their inclusion in dedicated funding schemes** are all conditions for their long-term survival.

Topic 3: Diversification, intercropping and service plants

Achievements

Faced with the challenges of land degradation, erosion and pest infestations, crop diversification and the integration of service plants have provided agroecological solutions adapted to local contexts.

Combining maize with legumes such as Cajanus cajan and Mucuna pruriens, tested by AFDI in Côte d'Ivoire and UPPA-HOUET in Burkina Faso, has improved soil fertility by increasing nitrogen content. In central Togo, the adoption of these crop associations has **increased maize yields by 300–370%** compared to conventional systems..

At the same time, the use of service plants such as **plant cover crops** (*Brachiaria*, dolique) has helped to preserve soil moisture and reduce the development of weeds. IECD's experience in Côte d'Ivoire has highlighted the effectiveness of vegetable crop associations in improving production and reducing chemical inputs.

The economic results have also been convincing. By reducing dependence on chemical fertilisers and improving productivity, these practices have boosted farm incomes . In Bouaflé (Côte d'Ivoire), farmers involved in crop associations have recorded a **15% increase in turnover** due to the higher value of their crops.

Finally, diversification and the introduction of service plants have helped to improve household food and nutritional security, by encouraging a more varied diet and reducing vulnerability to climatic hazards.

Lessons learnt

Firstly, **the effectiveness of intercropping depends on local adaptation of technical itineraries**. Adjustments in sowing densities, cropping calendars and soil management practices are needed to ensure optimum interactions between crops.

Secondly, **diversification and the introduction of service plants require greater technical support**. IECD's experience in Côte d'Ivoire has shown that training farmers in intercropping techniques and crop rotation is crucial to ensuring the sustainable adoption of these practices.

Thirdly, **integrating these practices into value-adding marketing channels is a key lever for their dissemination**. AFDI's experience in Côte d'Ivoire has highlighted the role of agroecological labelling and short distribution channels in increasing demand for these products.

Finally, the scaling up of these practices depends on **the collective structuring of producers and the institutional recognition** of crop associations as a viable alternative to conventional systems. Capitalizing on and disseminating these experiences within farmers' organisations and public policies is essential if they are to take root in the long term.

Topic 4: Crop-livestock integration in agropastoral systems

Achievements

By promoting greater synergy between crop and livestock production, integrated farming and livestock practices have improved soil fertility, optimised the management of natural resources and boosted producers' incomes.

The initiatives carried out by FPGL in Mali and RAFIA in Togo have highlighted the key role of animal traction in improving yields and reducing the drudgery of agricultural work. The introduction of **ploughing kits** (ploughs and draught oxen) and **transport kits** (carts and donkeys) by RAFIA in Togo and Terre Verte in Burkina-Faso has helped expand cultivated land and made it easier to transport crops and inputs, particularly manure.

The use of crop residues as fodder by UPPA-HOUET in Burkina-Faso and the integration of **forage crops** (*Brachiaria*, *Mucuna*, dolique) tested by AMEDD in Mali as well as intensive grazing on wasteland by Terre Verte (Burkina-Faso) have shown significant results in terms of improving animal feed and using animal waste to fertilise the soil.

From an economic point of view, these approaches have enabled producers to reduce their expenditure on chemical fertilisers and animal feed, while generating additional income through the sale of manure or milk. The experience of RAFIA in Togo showed that better producer organization can optimise the management of biomass flows between crops and livestock.

Lastly, these practices have improved the balance of agro-ecosystems by limiting pressure on grazing land and improving water retention in soils, thereby helping them to adapt better to climatic hazards.

Lessons learnt

Firstly, **the provision of appropriate infrastructure (livestock pens, manure pits, forage drying sheds) is essential** to ensure efficient management of animal and plant resources. FPGL's experience in Mali has shown that the development of specific sites for storing manure and forage help optimize their use.

Secondly, **the social acceptance of these practices depends on good relations between herders and farmers**. AMEDD's projects in Mali have highlighted the importance of inter-community dialogue in reducing land use conflicts and promoting secure land tenure agreements.

Thirdly, **the success of integration depends on the availability and accessibility of forage plant seeds**. RAFIA's experience in Togo has shown that setting up fodder nurseries and training producers in seed production are key factors in ensuring the sustainability of these practices.

Finally, **scaling up these approaches requires sustained institutional and technical support**. The integration of crop-livestock management techniques into agricultural advisory systems and the introduction of dedicated funding for small-scale producers are essential levers for encouraging the sustainable adoption of these practices.

Topic 5: Valorization and commercialization of agroecological products

Achievements

By developing specific marketing channels and appropriate certification mechanisms, initiatives aimed at the valorization and commercialization of agroecological products have boosted the attractiveness and competitiveness of products produced using sustainable practices.

RAFIA's experience in Togo has shown that organising producers into **Participatory Guarantee Systems (PGSs)** makes it possible to certify agroecological products at a lower cost, while boosting consumer confidence. The introduction of **local label** has contributed to **an average increase of 10% in product sales prices** compared with conventional products.

In Côte d'Ivoire, AFDI has experimented with strategies to promote agroecological products by developing **local markets**, thereby facilitating producers' access to urban consumers. This initiative has reduced the costs associated with intermediaries and improved farmers' remuneration.

In Senegal, ECLOSIO has encouraged the emergence of **processing cooperatives** that add value to agroecological products. Collective processing units have helped to improve the structure of local industries and increase employment opportunities, particularly for women and young people.

These experiments have also shown that adding value requires **better control of the technical processes involved in producing, processing and preserving** agroecological products. Technical support and networking between players have been key factors in improving the profitability and market recognition of these products.

Lessons learnt

Firstly, **the collective organisation of producers is a key factor for success**. Organising producers into cooperatives or groups facilitates access to markets, strengthens their negotiating power and enables them to pool the costs of certification and marketing.

Secondly, **the adaptability of labels and certifications to local realities is essential**. RAFIA's experience in Togo has shown that PGSs, as an alternative to costly organic certification, are an effective lever for recognising and promoting agroecological products.

Thirdly, **the development of short, differentiated marketing channels encourages the sale of agroecological products**. Local markets and direct sales to consumers, tested by AFDI in Côte d'Ivoire, have reduced the margins of intermediaries and increased the profitability of agroecological farms.

Finally, **access to finance and support for producers in processing their products are necessary conditions for scaling up these initiatives**. ECLOSIO's experience in Senegal shows that setting up processing units and strengthening farmers' technical skills can expand outlets and stabilise incomes.

General conclusion and outlook

This capitalization guide illustrates **the richness and diversity of the agroecological experiences** conducted as part of the Agroecology Programme in West Africa (PAE), implemented by ECOWAS through RAAF, with support from AFD and the European Union. It bears witness to the **commitment of players in the field** — producers, farmers' organisations, local authorities, researchers and trainers — to **co-constructing sustainable solutions tailored to the producers' concerns**, in the face of the region's agricultural, environmental and social challenges.

The results are many: improved soil fertility and health, reduced use of chemical inputs, increased climatic resilience of farms, economic empowerment of women and young people, rehabilitation of degraded ecosystems, and improved market access for agroecological products. These results demonstrate **the feasibility and relevance of agroecology as a path towards more sustainable, equitable and resilient agriculture**.

In addition to the successes observed, there are a number of cross-cutting lessons to be learnt that call for further efforts. **If the changes underway are to be sustainable, collective dynamics need to be consolidated, land tenure needs to be secured, local technical support needs to be provided, appropriate marketing channels need to be developed and, above all, agroecological practices need to be given greater recognition in national and regional public policy**.

To amplify the impact, it is essential to continue and step up investment in **action research, training, farm advisory services and multi-stakeholder dialogue**. Scaling up best practices also requires **structured institutional support** to remove the technical, economic and regulatory barriers identified over the course of the projects.

By capitalizing on the inspiring initiatives documented in this guide, ECOWAS and its partners are contributing to a **growing pool of concrete experiences to inform the design of ambitious policies** in favour of agroecology. This capitalization is a key step, but not an end point. It calls for **continued mobilization** to make agroecology a central pillar of food security, agricultural sovereignty and rural development in West Africa.

List of acronyms

ACF – Action contre la faim, Burkina Faso mission (Burkina Faso)
ACEF – Canadian Education and Training Association (Canada)
ACN – Contour land management
AFD – Agence française de développement (France)
AFDI – French Farmers and International Development (France)
AGRINNOV – Agricultural Innovation in Côte d'Ivoire (Côte d'Ivoire)
AMEDD – Malian Association for Awareness of Sustainable Development (Mali)
ANOPACI – National Association of Professional Agricultural Organisations of Côte d'Ivoire (Côte d'Ivoire)
APESS – Association for the Promotion of Livestock in the Sahel and Savannah (Afrique de l'Ouest)
APEUFO – Improving the Production and Efficient Use of Organic Manure (Burkina Faso)
ARAA – Regional Agency for Agriculture and Food (ECOWAS)
ARFA – Association for Research and Training in Agroecology (Burkina Faso)
AS – *Associação asas de Socorro* (Guinea-Bissau)
ASPSP – Senegalese Association of Farmers' Seed Producers (Senegal)
ASPRODEB – Senegalese Association for the Promotion of Grassroots Development (Senegal)
AVEC – Village Savings and Credit Associations
AZN – Zood Nooma Association (Burkina Faso)
BIM – Beneficial indigenous micro-organisms
BSP – Sharing the Sahelian Bocage
CADI-Togo – Integrated Development Support Centre (Togo)
CARFS – Support and Research Centre for Solidarity Financing (Mali)
CED – Centre for Ecology and Development (Togo)
CIRAD – Centre for International Cooperation in Agricultural Research for Development (France)
CIRES – Ivorian Centre for Economic and Social Research (Côte d'Ivoire)
CLC – Community Listening Clubs
CNCR – National Council for Rural Dialogue and Cooperation (Senegal)
CNOPG – National Coordination of Farmers' Organisations of Guinea (Guinea)
CNTA – Centre for No-Till Agriculture (Ghana)
CPAK – Cooperative of Agricultural Producers of Kiffosso (Mali)
CPR – Rural Promotion Centre (Burkina Faso)
CPC-Togo – Cooperation to support the integral development of Togo (Togo)
CRES – Centre for Sociological Research and Studies (Senegal)
CSRS – Swiss Centre for Scientific Research (Côte d'Ivoire)
CTOP – Togolese Coordination of Farmers' Organisations (Togo)
ETD – Enterprise, Territories and Development (Togo)
FENABE – National Federation of Organic and Ecological Farming Producers (Mali)
FPGL – Fondation Paul Gérin-Lajoie (Canada)
FUPRO – Federation of Producers' Unions of Benin (Benin)
GRET – Research and Technological Exchange Group (France)
ICAT – Institute for Technical Advice and Support (Togo)
IECD – European Institute for Cooperation and Development (France)
IER – Rural Economy Institute (Mali)
INERA – Institute for the Environment and Agricultural Research (Burkina Faso)
INP-HB – National Polytechnic Institute Félix Houphouët-Boigny (Côte d'Ivoire)
INRAB – Benin National Institute for Agricultural Research (Benin)
INRAN – National Institute for Agronomic Research of Niger (Niger)
IRAG –Guinea Agronomic Research Institute (Guinea)
IRD – Development Research Institute (France)
ISRA – Senegalese Institute for Agricultural Research (Senegal)
ITRA – Togolese Institute for Agricultural Research (Togo)
IAR –Institute for Agricultural Research, Ahmadu Bello University (Nigeria)
KITA – Kumasi Institute of Tropical agriculture (Ghana)
MAPTO – Peasant Alliance Movement of Togo (Togo)
NARI – National Agricultural Research Institute (Gambia)
OADEL – Organisation for Food and Local Development (Togo)
ORAD – Rural Organisation for Sustainable Agriculture (Benin)
PEMSD – Planning, Evaluation, Monitoring and Statistics Department (Sierra Leone)
PGS – Participatory Guarantee Systems
PPA/UNA – Autonomous Farmers' Programme – National University of Abidjan (Côte d'Ivoire)
PPD – Plant Protection Division
RAFIA – Research-Support and Training for Self-Development Initiatives (Togo)
SAM – Millennium Action Synergy (Togo)
SCZSB – Société coopérative Zagnanado pour le soja bio (Côte d'Ivoire)
SCOOPSO – Simplified Cooperative Society (Togo)
TAVTC – Tumutu Agricultural Vocational Training Center
THP-SN – The Hunger Project Senegal (Senegal)
TV-BF – Terre verte Burkina Faso (Burkina Faso)
UAVES – Union for an Ecological and United Future (Mali)
UFR-S2ATA/UGB – Training and Research Unit in Agronomy, Aquaculture and Food Technology – Gaston Berger University (Senegal)
UPPA-HOUET – Provincial Union of Agricultural Professionals of Houet (Burkina Faso)
UPPA-Est – Provincial Union of Agricultural Professionals of the East (Burkina Faso)
UROPC-S – Regional Union of Cereal Producers' Organisations in the Savanes region (Togo)
URCMP – Regional Union of Vegetable Growers' and Planters' Cooperatives of Gao (Mali)

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