



PROMOTING CLIMATE-SMART AGRICULTURE IN WEST AFRICA

CAPACITIES STRENGTHENING ON CLIMATE-SMART AGRICULTURE (CSA):

Good practices and illustrative examples during field visits in Ghana



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Capacities strengthening on Climate-Smart Agriculture (CSA):

Good practices and illustrative examples
during field visits in **Ghana**

Strengthening the capacities of stakeholders in the framework of the Regional Project
Promotion of Climate-Smart Agriculture in West Africa (CSA)

Bénin, Burkina Faso, **Ghana**, Niger et Togo

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INTRODUCTION

Climate change is seriously impeding the productivity and sustainability of production systems, especially in African countries south of the Sahara. Climate Smart Agriculture (CSA) is a reliable approach that aims to improve productivity, adapt and reduce greenhouse gases for more resilient and sustainable agriculture. However, the concept remains little known and unexploited by producers and all executive and technical support staff for rural development.

As part of the implementation of the regional project to promote Climate-Smart Agriculture (CSA) in West Africa (AIC-BOAD) by the Regional Agency for Agriculture and Food (RAAF) acting as Project Executing Agency, and the partnership agreement between RAAF/ECOWAS and CIAT/CGIAR, CIAT/CGIAR provides technical support for knowledge improvement and capacity building techniques, through regional

and local interactions with a view to promoting agricultural practices resistant to the harmful effects of climate change. To this end, a series of capacity building sessions for executives and technicians from national and regional institutions on the formulation and implementation of climate-smart projects including integrated approaches were organized in each of the five countries of the project. In order to operationalize the principles of CSA and facilitate its adoption and implementation, the utilization of proven best practices is an efficient strategy to take better advantage of success stories adapted to the local context.



Best practices are a set of standards, rules and principles for the sustainable production of crops and livestock.

In general, best practices aim to help agricultural producers

maximize yields ;

preservation and processing of agricultural products ;

optimize business operations while minimizing production costs and environmental impact.

They allow managers and technicians to guide technical and policy choices for the benefit of farmers. Compliance with good agricultural practices for climate-smart agriculture allows producers to make their production system more resilient by minimizing climate risks and greenhouse gas emissions.

This guide illustrates elements for identifying and evaluating good CSA practices on the visited sites during the regional training at Bolgatanga and Tamale in Ghana. It also includes elements to identify and evaluation of best CSA practices, and an inventory and detailed description of best CSA practices for Ghana.

METHODS FOR INVENTORING

AND CHARACTERIZING GOOD PRACTICES

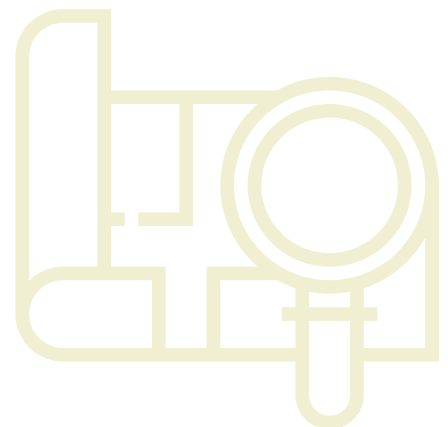
01. Methods for inventorying good practices

The used methodology can be divided into two main phases (i) an inventory of practices and (ii) a categorization by sub-sector of agriculture through a literature review and confirmed by participant observations following a visit field guide during the pre-visit of the sites.



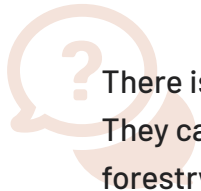
02. Methods for identifying examples of sites and practices visited during capacity building sessions

Each field visit during the regional trainings was organized in two (02) phases: (i) a phase of identification of site examples in collaboration with the national coordination teams of the AIC project, and (ii) a field visit phase with participants from the workshop. For the first phase, each example site was chosen from several proposals made by the national coordinators and their teams, taking into account the AIC characteristics after a pre-visit by the trainers i.e. the day before the visit with the participants.



IDENTIFICATION OF CSA BEST

PRACTICES USED BY SUB-SECTOR



There is a diversity of CSA practices/technologies developed to adapt to climate variability. They can be grouped by subsectors such as crop production, animal and fish production, forestry, value chains and energy.

01. Crop production sub-sector

The practices/technologies developed in CSA in the crop production sub-sector are oriented towards



the prevention and management of climate risks often through Climate Information Services;



management of cropping systems and the agricultural calendar;



management of plant production materials (improved crop varieties and/or resistant to hazards)



water and soil conservation practices.

These practices can be grouped according to different categories as indicated in the Table 1 :

Soil management

use of stable manure to improve agricultural production, mulching crops (ex: harvest residue, straw or polyethylene film),



Crop management

use of improved or adapted varieties (ex: short-cycle varieties, resistant to drought and disease), the Intensive Rice Cultivation System (SRI)



Water management

refers to efficient irrigation techniques such as localized irrigation systems (ex: drip irrigation, microdiffusers, etc.), capillary systems, soil water conservation techniques, etc.

Pest management

use of plant extracts and biological agents in pest management.



02. Animal production sub-sector

The practices/technologies developed in the animal production sub-sector are essentially oriented towards i) the improvement of breeding systems, ii) reproduction techniques and iii) animal feeding by valorising the by-products of plant production without however compromise the environment. This involves: i) the introduction of improved breeds, ii) crossing with local breeds for good resistance to diseases, iii) the constitution of food reserves for the dry season (hay, silage, etc.), iv) the cultivation of resistant fodder varieties and v) the practice of seasonal livestock mobility (Table 1).

03. Fisheries production sub-sector

Fish production practices/technologies aim to improve the performance and profitability of farming systems through good management of fish species, habitat hygiene and water quality management. In this group of practices we can cite for example i) the use of floating cages and fish ponds, ii) the fertilization of ponds, iii) the use of short-cycle fish strains (example of tilapia), iv) the breeding of fish in ponds, and v) the use of above-ground containers, etc. (Table 1).

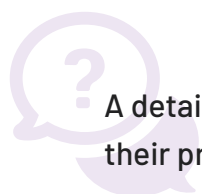
04. Forestry sub-sector

The main goal here is the conservation of forest ecosystems as carbon sinks (sequestration). It brings together all planning and rational management practices of natural resources such as i) agroforestry, ii) afforestation, iii) reforestation and iv) assisted natural regeneration practices.

05. Development of value and energy chains

Promoting value chains involves bringing together stakeholders from multiple parts of the value chain (producers, processors, transport, regulator, etc.) to make decisions in a coordinated manner. The practices/technologies developed aim i) at storage, ii) product conservation, iii) local processing of agricultural products and iv) the rational use of natural resources (FAO, 2017) (Table 3.1). The practices/technologies developed are oriented towards: (i) the valorization of solar energy in agricultural production (powering solar pumps for irrigation), (ii) animal production (lighting of chicken coops with solar panels), and (iii) value chains (solar dryer).

DETAILED INVENTORY OF GOOD AGRICULTURAL PRACTICES CSA BY SUBSECTOR IN GHANA



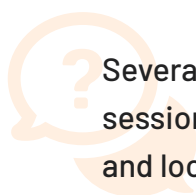
A detailed inventory is presented in table 1 according to the agricultural subsectors and their production subsystems.

Tableau 1 : Inventory of good agricultural CSA practices by sub-sector in Ghana

		GHANA
VEGETABLE PRODUCTION: Owuso Essegbey et al. (2016); Daadi et al. (2021); Avane et al. (2022) Daadi and Latacz-Lohmann (2022) Botchway et al. (2016); Upboff (2008);	Soil management	Organic amendment (composting), animal manure, Chemical fertilizers Mulching, intercropping, cover crops (Mucuna, etc) Promotion of water and soil conservation practices
	Management of plant material	Use of improved varieties of crops (short cycle varieties, resistant to drought and disease)
	Water Management	Irrigated Rice System (IRS)
		Practice of localized irrigation (drip or microdiffuser)
	Pest management	Use of botanical extracts and biological agents in pest management
	ANIMAL PRODUCTION: Botchway et al. (2016)	Food management
FISH PRODUCTION: FAO (2022); APDRA (Association for Pisciculture and Rural Development in Humid Tropical Africa)(2015); Kassam, L. (2014)	Cash management	Use of native species, short-cycle and fast-growing species
	Breeding habitat	Introduction of fish species tolerant to salinity or shock and the use of quality fry and broodstock
		Use of floating cages
VALUE CHAINS AND ENERGY: Energy Commission and Global Alliance for Clean Cookstoves;	Agro-food processing	Agro-food processing
	Renewable energies	Use of solar pumps for pumping water in agriculture
		Use of improved stoves (Gyapa, Toyola stoves)
FOREST: Botchway et al. (2016)	Reconstruction of the forest cover	Reforestation, afforestation Régénération naturelle assistée (RNA)
	Promoting biodiversity	Agroforesterie
		Promotion of beekeeping to improve plant pollination

EXAMPLES OF SITES AND PRACTICES VISITED

DURING CAPACITY BUILDING SESSIONS




Several examples of good CSA practices on the visited sites during the capacity building sessions have been described below (table 2) and illustrated with regard to the CSA pillars and local specificities.





Tableau 2 : CSA good practices sites visited in Bolgatanga and Tamale (Ghana)

Bolgatanga

Site	Intelligence AIC	Sous-secteur	Pratiques	Illustration
GASIP Climate Resilient and Conservation Agriculture Demonstration Plot	<ol style="list-style-type: none"> 1. Climate 2. Water 3. Soil and nutrients 4. Energy 5. Information and knowledge 6. Value chain 	<ol style="list-style-type: none"> 1. Cropping 2. Integrated crops and livestock 3. Women empowerment 	<ol style="list-style-type: none"> 1. Climate information (rain gauge) 2. Irrigation (surface and subsurface sources) 3. Conservation agriculture 4. Women organization 5. Self-training / learning 6. Demonstration plot 7. Gender (women group) 8. Full year cropping 	

Site	Intelligence AIC	Sous-secteur	Pratiques	Illustration
GASIP Climate Resilient and Conservation Agriculture Demonstration Plot	<ol style="list-style-type: none"> 1. Climate 2. Water 3. Soil and nutrients 4. Energy 5. Information and knowledge 6. Value chain 	1. Agroforestry (ANR)	3. Agroforestry	

Tamale

Site	Intelligence AIC	Sous-secteur	Pratiques	Illustration
Kukobila Nasia Farms limited	<ol style="list-style-type: none"> 1. Climate 2. Water 3. Soil and nutrients 4. Energy 5. Information and knowledge 6. Value chain 	1. Cropping (maize, rice, soybean) - Rainfed - Offseason irrigated	<ol style="list-style-type: none"> 1. Climate information (Station/rain gauge) 2. Irrigation (White Volta, surface water sources) 3. Agroforestry 4. Solar panel (electricity production and selling) 5. Full year cropping 	  
		2. Vegetables (Offseason irrigated)	<ol style="list-style-type: none"> 1. Climate information (Station/rain gauge) 2. Irrigation (White Volta, surface water sources) 3. Agroforestry 4. Solar panel (electricity production and selling) 	



CONCLUSION

This guide documented the examples of best CSA practices visited during the field visit to the sites in Ghana. All the best practices visited in the Bolgatanga and Tamale regions served as examples to illustrate the level of smartness of the options. In addition to these options, this guide has also inventoried, based on a literature review, several potentially best CSA practices that could support the implementation and promotion of CSA in Ghana.

This guide will allow managers and technicians to guide technical and policy choices for the benefit of farmers. Compliance with good agricultural practices for climate-smart agriculture will allow producers to make their production system more resilient by minimizing climate risks and greenhouse gas emissions while ensuring sustainable agricultural production.



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