BUILDING BIOCARBON AND RURAL DEVELOPMENT IN WEST AFRICA (BIODEV)

ANNUAL WORKPACKAGE PROGRESS REPORT 2014-2015

Workpackage WP1.2

1. Executive summary

WP1.2 “agroforestry and farm interventions” is one of the seven workpages of the BIODEV project being implemented in Burkina Faso and Sierra Leone since August 2012. For the year July 2014– June 2015, the activities have been focused on planting 300,000 trees of various species for enhancing carbon stock of the project area, enhancing farmers’ capacity to manage the established resource centres and the implementation of experiments on farms and on demonstration plots. To be able to reach the target of planting 500,000 trees as stated in the project document, farmers have been trained and supplied with adequate material to propagate and plant 300,000 trees on degraded areas and the border of all management units of the entire forest. The rest of 200,000 plants would be completed by WP1.3. About 300 farmers who are members of the RRCs have participated to focus group discussion in order to evaluate the management and the dynamism of the RRCs and to train to efficiently manage their centres.

The experiments planned on integrated soil fertility, improve fruit trees plantation, small garden plot for intensive leafy vegetable production and the impact of water stress were all installed and are being monitored. Height potential manuscripts were then drawn to be written and published into scientific journal within a year.

2. Activity report

For all the objectives and target outputs, activities have been defined and conducted in order to achieve the planned 6 development and research outputs for WP1.2 from July 2014 to June 2015.

2.1. Activities conducted

The activities planned for the year 2014-2015 and their level of achievement are summarized in Table 1.

Table 1: Summary of the main achievements of the reporting period

Outputs	Activities planned for reporting period	Achievements in reporting period	Deliverables in reporting period (*)	Challenges/observations
1.2 D1 Priority agroforestry systems and species for different communities identified with local participation and their adoption supported	Finalize the report of the baseline surveys and studies to understand land management practices from farmers, identify priority agroforestry systems and species with local participation	- Data on priority species were retracted from the scoping study for analysis and manuscript writing. A draf manuscript is being finalized about "Participatory selection of priority trees and agroforestry trees function for biocarbon purposes in Burkina Faso".	Draft manuscript	
	Conduct survey for understanding local knowledge on ecological functions of priority tree species and their availability in fields, fallow and forest	- The study is being implemented in the 4 pilot villages and is planned to be ended at the end of June 2015. The study consists of semi-structured interviews conducted in the field and focus group discussions and it also involves using a range of participatory tools knowledge. The software AKT5 (Agro- ecological Knowledge Toolkit) will be used to collect, record and analyze local knowledge about tree species and their ecological interactions in the parkland to improve our understanding of agroforestry	Report	Manuscript for publication in 2016 "Multiple knowledge systems of tree attributes to design best-fit options for agroforestry parklands".

		practices and tree management and to include farmers, local scientists and rural advisory services in exploring best fit and gender sensitive agroforestry options.).		
	Training on Value Chains and Utilization of Adapted Agroforestry Species	- The terms of reference are completed in collaboration with WP1.1. The training will be organized in July or August 2015 in Burkina Faso. The aim of this training-of-trainers is to strengthen the capacities/knowledge and skills of extension agents, NGO staff, researchers, and university lecturers, to enable them to teach and extend improve agroforestry practices especially recent advances in the selection, propagation, cultivation and marketing of high value agroforestry trees species in Burkina-Faso. Participants to this training-of-trainers will be selected from government technical services, NGOs and CBOs, universities, agricultural schools and the private sector involved in training, research or development in the domain of natural resource management, agroforestry, forestry, and agriculture.		
1.2 D2. Capacity of extension, development organizations, and farmers in agroforestry management strengthened	Train farmers in rural resource center management	- In April 2015, one session of training was held, in each of the four pilot RRCs (Cassou, Dao, Kou and Vrassan) in order to evaluate the management and the dynamism of the RRC using	Infrastructure reception report	The basic infrastructure is available and can be used by all other

			focus group discussions method. The discussion involved all the members of the RRC varying from 50 to more than 100 people. In addition, a coordination meeting involving all the executive members of all the four RRC was organized. During each of the session, the discussions centered around the following themes: Group management (characteristics, leadership, holding of meetings, performance indicators); Group cohesion, interaction between EXCO and members, conflict management (by Charlie); Assessment of the level of implementation of the action plan; the support received so far from the project and the contribution of each of the beneficiary RRC. Each of the session ended with a simplified and participatory SWOT analysis of the RRC (by Bertin and Catherine). New action plans were realized for the year 2015.	Training report	WPs for training and demonstration.
	Tree nursery and on-farm tree management	-	70 women and 75 men were trained on nursery plant production technology from 23 to 28 February 2015. Two extension service agents of the ministry of forestry were involved in the training of farmers as trainers. Nursery plant production material was acquired and distributed to the RRCs for 300,000 plant propagation.	Training report	

	Monitor activities conducted in the demonstration plots of the Rural Resource Centers	- 16 accessions of grafted and non-grafted plants of 6 fruit, vegetable and fodder tree species (*Afzelia africana, Adansonia digitata, Bombax costatum, Tamarindus indica, Vitellaria paradoxa and Ziziphus mauritiana*) were planted in the demonstration plots of the 4 RRCs. The survival rate varied from 65 to 100% where non-grafted plants with non-grafting plants having higher survival rate than grafted plants. All plants of non-grafted *A. digitata* are surviving in contrast to *B. costatum* which had of survival rate (65%).		
	Prepare and disseminate information packages including leaflets, brochures, posters, reports and other publications and documentary films to key beneficiaries on leadership, group dynamic, AF system management, FMNR	- Training materials were prepared which are available for group dynamics, nursery plant production and farmer managed natural regeneration.	Training support materials	
	Conduct a socio-economic and impact analysis for the tested AF practices in target villages based on theory of change principles	- Socio-economic survey will be conducted the last year of the project.		
1.2 D3 Sustainable, private oriented, climate change proofed germplasm	Support private oriented actors to establish production areas for sustainable and climate change proofed	- A master student has been hired for studying the seed and seedling system in the project area. The results of the study will be used to identify the		

production and delivery systems supported	germplasm production and delivery systems (Identify private nurseries, plan their training in improve plant material production such as cuttings or grafting)	private nursery people who will be trained in vegetative propagation, especially plant grafting to enhance their capacity of propagating agroforestry tree species in the project area.		
1.2. R1 Strategies for promoting and maintaining on-farm tree diversity and appropriate agroforestry systems and species (with attention to adaptation and mitigation roles) identified and methods for tree adaptation analysis developed and disseminated	Establish farmer managed natural regeneration and enrichment plantings with improved species/varieties trials on-farms	- 120 farmers were identified within the 4 pilot village sites for training into farmer managed natural regeneration and enrichment planting before the establishment of the rainy season.	Training report	
	Establish trials on-farms for improved new field clearing of woodlands or parklands) for agricultural production	- This study was particularly planned for Sierra Leone where fire has been identified as the main constraint that farmers face in the project area. However its implementation was impeded because of Ebola disease.		Ebola expansion prevent this activity
1.2. R2 Tree planting materials/germplasm eco-physiologically characterized for general properties and abiotic stress (drought, temperature, salt, pests and diseases)	Evaluate the water use efficiency of improved plant material, including timber, fruit and fodder tree species (Water stress nursery experiment)	- Experiment has been established to determine the water use efficiency of 4 agroforestry tree species (Adansonia digitata, Parkia biglobosa, Tamarindus indica, Vitellaria paradoxa). The experiment is being monitored at INERA for up to 18 months. An automatic weather station has been installed next to the experiment place		

		and climatic data (temperature, wind speed, rainfall, solar radiation) monitoring.		
1.2.R3 Best bet germplasm supply systems for their distribution identified	Survey on procurement and delivery of germplasm systems / Analyse tree seed and seedling supply systems for agroforestry tree species for improvement	- "A master student hired from the University of Bobo will collect data regarding seed and seedling supply systems for agroforestry tree species in the project area. The main points consist of germplasm production status and quality control systems, sources of supply in tree seed and plant materials, cost and benefits of tree plant production, policy/regulations on tree seed production and delivery in the Sahel, management implications and concluding remarks."		
	Collect germplasm and establish nurseries of agroforestry tree species in RRC / Production of plants for forest tree planting by farmers	- "300,000 plants of various tree species are being grown in the nurseries for planting in 450 ha degraded area of the forest and 314,425 m of the management unit borders of all Cassou forest. Two exotic species (*Acacia colei* and *Prosopis juliflora*) will be planted on management unit borders while indigenous fruit, fodder, fuelwood and vegetable tree species will be planted in the degraded area in the forest. The species are *Pterocarpus erinaceus, Anogeissus leiocarpus, Balanites aegyptiaca, Bombax costatum, Adansonia digitata, Afzelia Africana, Parkia biglobosa,*	Tree planting strategy report	The protection and irrigation of the planted trees necessary for the success of the activity

		Tamarindus indica, Khaya senegalensis, Vitellaria paradox, *Anacardium occidentale*."		
	Develop suitable and productive improved species and varieties for timber, fruit, fodder production (Samanko research - fodder and food bank trials, vegetative propagation experiments by cutting, grafting and layering)	- Impact of various management options on fodder production of *Pterocarpus erinaceus* and *Gliricidia sepium* in the Sahel has been examined at Samanko, in Mali. The results revealed no significant difference between the frequencies of pruning for *P. erinaceus* for total biomass, but marketable fodder (branch≥50 cm) was more important in 3 and 4-month pruning intervals. Moreover, pruning at 1.30 m gave significantly (P<0.05) higher fodder biomass (2.7±0.2 kg tree-1) than at 0.5 m high (2.1±0.2 kg tree-1).		
1.2.R4 Agroforestry management trials (e.g. for soil carbon, for integrated tree-crop-livestock systems) for sustainable intensification and diversification developed and tested	Establish experiments using trees for improving soil fertility (including fertilizer trees and staple crops) and water management on-farms (contour line management using *Moringa oleifera* and *Gliricidia sepium*)	- Agronomic trials for sustainable agricultural production has been design to be implemented into 200 farmers (50 voluntary per pilot village) field. Site-specific land management will be tested with 11 treatments including mineral fertilizers combine or not with manure.	Protocol available	
	Establish experiments using vegetable tree species associated with other annual vegetable species	- Protocol was written for intensive leafy vegetable production from baobab (*Adansonia digitata*) and *Moringa oleifera* associated with annual vegetable such as been, egg plants during the rainy season	Protocol available	

(*): report, policy brief, manual, article, number of trained people, number of farmers attended, etc.

2.2. Implications of the year results

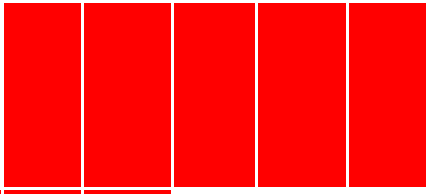
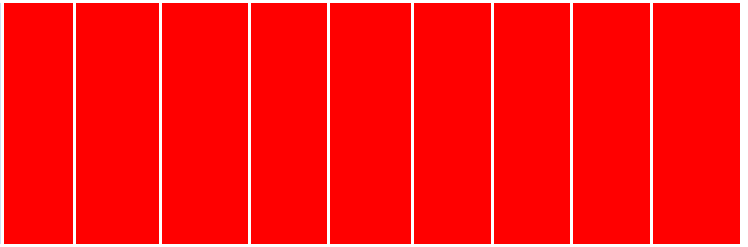
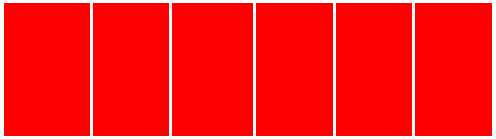
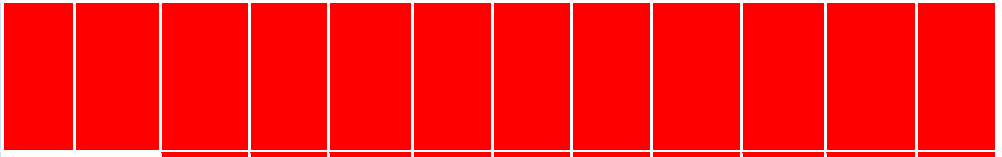
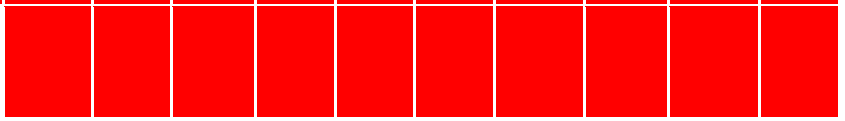
The training of farmers, members of the established rural resource centres (RRCs) in nursery plant propagation was very helpful for the target of 300,000 tree planting in the degraded areas of the Cassou forest. About 150 farmers of which ¾ are women are now able to propagate various indigenous agroforestry tree species. Women have also started producing vegetable using the water from the borehole so that water has been a limited. The focus group discussion with farmers have also help to determine weaknesses of the group and discuss how to address all the constraints however, a follow-up training is still needed for farmers next year to enhance their capacity to mobilize funding and investigate efficiently for beneficial interactions between them and researchers, extension workers, NGO, etc. In order to speed up the adoption of agroforestry practices in the project areas, farmers were encouraged to actively participate in the establishment and monitoring of all the experiments and trials being conducted either in on-farm or demonstration plots. Despite the short time of the project implementation, 8 potential topics could be drawn from the various activities including surveys and experiments for future publication.

3. Annual workplan for July 2015 – June 2016

The activities for the next year 2015-2016 are given in Table 2. Activities will be focused on the establishment of experiments of on monitoring and maintained of the planted trees in addition to all established experiments, supporting farmers to self-manage the RRCs while strengthening their capacity to mobilise funds.

Table 2: Summary of the main activities for July 2015 – June 2016

Outputs	Activities	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1.2 D1. Priority agroforestry systems and species for different communities identified with local participation and their adoption supported	Finalize AKT surveys and report												
1.2 D2. Capacity of extension, development organizations, and farmers in agroforestry management strengthened	Reinforce basic infrastructure for Rural Resource Centers.												
	Organize follow up training for farmers in Burkina Faso and Mali to consolidate their capacity to manage the establish RRCs (activities planning, monitoring and reporting, resource mobilization, etc.)												
	Organize workshops on tree nursery (seed collection, propagation by grafting) and tree management for farmers and partners												
	Support Farmers with improved germplasm of vegetable, stable crops and orchard tree species												
1.2 D3 Sustainable, private oriented, climate change proofed germplasm	Identify private nurseries, plan their training in improve plant material production such as grafting, cuttings or marcotting												

production and delivery systems developed		
1.2 R1 Strategies for promoting and maintaining on-farm tree diversity and appropriate agroforestry systems and species	Train more farmer to the practice of improve farmer managed natural regeneration (FMNR) and enrichment plantings with adequate species/varieties	
1.2 R2. Tree planting materials/germplasm eco-physiologically characterized for general properties and abiotic stress (drought, flood, temperature etc.)	Monitor water stress experiment on station using 6 priority tree species common to both Burkina Faso and Sierra Leone	
1.2 R3 Best fit germplasm supply systems for their distribution identified	Analyse seed and seedling supply systems of agroforestry tree species.	
	Monitor trials on the effect of grafting and irrigation on the growth and fruit production of indigenous tree species on the demonstration plots	
	Carried out on-station experiment of vegetative propagation of fruit and monitor fodder tree species	

1.2 R4 Agroforestry management trials (e.g. for soil carbon, for integrated tree-crop-livestock systems) for sustainable intensification and diversification developed and tested	Monitor and evaluate on-farm trials for determining better management options of soil fertility for sorghum and mays													
	Monitor and evaluate intensive leafy vegetable production trial with baobab and moringa													