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Enhanced climate resilience of rural communities in central and north Benin through the implementation of ecosystem-based adaptation (EbA) - SAP005

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Acronyms and abbreviations

AVIGEF	:	Association Villageoise de Gestion des Forêts
CBD	:	Convention on Biological Diversity
CFMC	:	Community Forest Management Committees
CI	:	Confidence Interval
CSA	:	Climate Smart Agriculture
EbA	:	Ecosystem based Adaptation
CF	:	Community Forest
FMNR	:	Farmer Managed Natural Regeneration
GCF	:	Green Climate Fund
GIS / RS	:	Geographic Information System / Remote Sensing
Ha	:	Hectares
ICRAF	:	International Centre for Research in Agroforestry / World Agroforestry
IE	:	impact evaluation
IEU	:	Independent Evaluation Unit
Kg	:	Kilogram
LORTA	:	Learning-Oriented Real-Time Impact Assessment
M&E	:	Monitoring and Evaluation
M&E	:	Monitoring and Evaluation
NGO	:	Non-Governmental Organization
NTFP	:	Non-Timber Forest Product
ODK	:	Open Data Kit
OSN	:	Ouémé Supérieur and N'Dali
PABE	:	Ecosystem-Based Adaptation Project
PSM	:	Propensity Score Matching
RNA	:	Régénération Naturelle Assistée
SAP	:	Simplified Approval Process
SMART	:	Specific, Measurable, Achievable, Realistic and Timely
SO	:	Specific Objective
UA	:	Unité d'Aménagement / Management Unit
UNDP	:	United Nations Development Programme
UNEA	:	United Nations Environment Assembly
UNEP	:	United Nations Environment Programme
UNFCCC	:	United Nations Framework Convention on Climate Change
XOF	:	Franc CFA UEMOA

Executive summary

The Green Climate Fund (GCF) helps developing countries resilience capacity and to reduce their greenhouse gas emissions and better adapt to climate change by availing a significant and ambitious contribution to the global efforts towards attaining the goals set by the international commitments to combat climate change and achieving the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC). Benin is one of the partner countries involved in a GCF SAP Funding Proposals under the project "Enhanced climate resilience of rural communities in central and north Benin through the implementation of ecosystem-based adaptation (EbA) in forest and agricultural landscapes" – nationally known as – *Projet d'Adaptation Basée sur les Ecosystèmes* (PABE).

The objective of PABE project is to buffer communities against the effects of climate change by adapting agricultural livelihoods and investing in land stewardship. The project implements key EbA and climate-resilient agricultural interventions in the following seven municipalities of central and north Benin: *Dassa, Tchaourou, Djougou, Ouaké, Cobly, Boukoumbé* and *Banikoara*. As part of the overall Monitoring and Evaluation Framework of PABE, this report presents the consolidated baseline study conducted in Benin from September to December 2022 using the multi-year Learning-Oriented Real-Time Impact Assessment (LORTA) approach. the Independent Evaluation Unit (IEU) of the GCF started LORTA programme with the main goal of strengthening the capacities in assessing the impact of GCF intervention. The LORTA uses impact evaluation (IE) techniques to help understanding which activities are working, which are most efficient, and which approaches to scale up. Empirical evidence on impacts of climate-related projects is rather scarce.

It is within this context that the project team solicited the technical support of World agroforestry (ICRAF) to (i) carry out the baseline study to set the reference situation and (ii) a monitoring and evaluation plan to track and assess the results of the interventions throughout the life of the project. The report was elaborated following five major steps: 1) desk review and development of a draft baseline methodology, 2) baseline tools and indicators review meeting, 3) development and pre-validation of data collection methods, 4) training of investigators, finalization of data collection tools and quality control, and 5) data analysis and writing of the baseline study report. Data were collected in 666 households including 495 households in intervention sites and in 171 in control sites, using household questionnaires, key informant interviews, vegetation inventory to collect socio-economic, farm, forest management, and farmers cooperatives data.

Indicator analyses and M&E plan: The indicators assessed were the final list of indicators provided by PABE for the project. When an indicator was found not to respect the SMART criteria, the SMART criteria were rephrased accordingly. Baseline survey results show that males and females in all the studied villages are already practicing some EbA options amongst which Agroforestry, conservation agriculture, soil and water conservation techniques, improved forage, integration of fruits trees into existing farming systems, etc. They are also involved in diversified income generating activities amongst which, NTFPs collection and processing, charcoal, and apiculture. Efforts should be made to improve women's participation in project activities and ensure their effective involvement, since fewer women are involved in EbA practices, according to the study results. Farmers and key informants interviewed during the baseline all confirm the communities are exposed to several climate risks and vulnerability. These include irregular rainfall, heavy rains over short periods of time, droughts, floods, difficulty to carry out off seasons farming. Analysis reveals an interannual variability in rainfall amounts over the period 1971 to 2015 with a general upward trend in the Sudano-Guinean zone. Focus group discussions with farmers did not suggest the existence of any climate change adaptation support materials or tools. Household surveys suggest that about 8% of the respondents are aware of some policy or plan(s) at national and/or local level on ecosystem-based adaptation or have used natural resources to adapt to climate change e.g. tree planting It is thus necessary to develop extension materials and strategies that response to climate risks and vulnerability.

Land cover and land use statistics indicate the state of degradation in each project site and thus possible to meet project target. Findings show that in the classified forest there are different land uses/cover which the project can build on for restoration e.g UA Bakou (58276.51ha), UA Bétérou (26982.15 ha). Baseline data show evidence of the existing use of EbA practices including agroforestry, Farmer Managed Natural Regeneration (FMNR), composting, intercropping, crop rotation on individual farmlands (section 4 for details). Discussions with community forest leaders indicate that some portion of community managed forest also benefit from enrichment plantings, restoration of degraded areas and other sustainable management practices. These activities will need to be intensified during PABE project implementation. Review of existing forest management plans reveal that none of them has elements of EbA. However, focus group discussions show that some members of the Bakou and Bétérou forest management committee of Ouémé-Supérieure and N'dali (OSN) protected forest had carried out carried EbA related techniques specifically tree planting activities and enrichment planting in the last two years prior to data collection in different parts of the forest including degraded lands, and in farms and settlements.

About 57% of both the control and beneficiary groups had planted at least one tree in the last year prior to data collection, while about 43 % had not planted any. More women than men had not planted any tree in both the control and beneficiary groups. Most of the farmers had contributed to protecting at least one tree. There were no preferences as to which species of trees were planted for different purposes in degraded forests, agricultural lands, and for enrichment plantings. It is important to take into consideration farmers potential to plant trees based on available land and other resources. It is important to take note of the survival rate of trees in different farming systems to establish the number of trees to be planted to meet project targets.

Current yields for maize, sorghum and soja based on survey data stand at 1.5tons/ha ,0.6tons/ha and 0.8 tons /ha respectively. While the yield for maize is closer to the averages of the commune recorded in 2020 by the bureau of agricultural statistics, they were all very low for sorghum and soja. For this reason, we make reference to yields for major crops as provide by the department of agricultural statistic. Survey results also show different sources of revenue amongst which livestock, agriculture and other sources. Generally, most household sell between 0% to 100% percent of their harvest depending on the product. For major staple such as maize and yams farmers sell between 40% to 50 % of their harvest respectively. For crops like groundnuts, soja, and sorghum, baseline result show that they respectively sell 90%, 80% and 70% of their harvest. Processing is not common in all the villages. Only a few households are into artisanal processing of NTFPs e.g Nere and shea. Baseline data also indicate that most household have access to food for 7 months of the year during which time they depend on their harvest or could buy. The most difficult months of the year where there is usually shortage of food are June -August. Only very few communities depend on wild forest products to cope during the difficult periods. Depending on the community and customs, some households may be over dependent on cereals or tubers especially during the harvesting seasons.

Socioeconomic characteristics of the respondents: A total of 666 respondents from 7 communes took part in the survey 25% of whom were females. The number of females however vary from one municipality to another from a low of 5% to a high of 44%. Low participation of women in some communities is largely due to religion and cultural differences that prevented some women from participating in the survey. In most cases women shy away from participating in the interviews. Some of the women were household heads or simply represented their husbands at the time of interview. On average respondents have been living in the village for about 34 years +/-17 years. There seem to be no significant difference between the number of years for women and men respondents. Survey results found that the average household sizes for both control and beneficiary villages was 9 members (+/-6 members). The average size of beneficiary households was relatively higher (10 members) compared to control households. For all categories of respondents combined, total average land holdings range from a low of 6.6 ha to a high of 10.7ha. Men generally had bigger land sizes (10.8ha) compared to women (5.4ha). Further analysis shows that some respondents from Ouaké, recorded the smallest land holdings compared to the other communes for example Dassa-Zoumè 11.7ha. The amount and size of land matter because it may determine the kind of EbA practices that a given household may adopt. Survey results show that

respondents farmlands could be either inside or outside the forest. Most of the respondents had land outside or around the forest while 11% had farmlands inside the forest. More farmers in Tchaourou (26.8%) and Djougou (47.7%) had farmlands inside the classified forest compared to their peers from the other communes who do not own farms within the community forests. More men (28%) compared to women (20%) had farmland inside the forest. No matter the sex, commune or typology of respondents, the most common mode of acquiring land was by inheritance. More men (55%) compared to women 38% had tree crop plantations. Only a very small proportion of both sexes 6% use part of their land as pasture. A good number (31%) could access the land by just clearing the forest since it was considered community/communal land. Most of the farmers reported that their lands were either wooded areas (36,7%) or forest areas (32%) when they acquired it. More female respondents (42%) claimed their land were wooded land compared to men and more men (34.5%) claimed their land were forest land compared to women (24.8%). Most of the farmers (62%) claim their land is in a degradation phase and more men (64.3 %) than women (55.2%) reported cases of land degradation. Perception of land degradation varied between the municipalities with the highest number of cases reported in Djougou, Boukombé and Ouaké in this order. Farmer reported several reasons for increasing soil degradation. The most cited by both male and female respondent (67%) was bad farming practices.

Sources of food and income: Discussions with the leaders of the case study cooperatives indicate that only 2 out of 14 case study cooperatives have any form of commercial contract with buyers. Some of cooperatives have informal contracts with buyers for example the group Suru tcheka in Djougou sells Nere to buyers from Niger through informal contract deals based on trust. It will be important to see how many new contracts will be engaged by these cooperatives and see the size of the income generated by these cooperatives to grow. Baseline data shows that some of the coops generate some income in the past year while others did not generate any. Maize and yams were the most common crops grown by a majority the households, at least 83%. Cashew was the most cited tree crop grown by at least 20% of the respondents. More men compared to women were found to be involved in the cultivation of Yams and cashew compared to maize where the differences were not very significant. Cotton was found to generate the highest mean annual revenue over the past 12 months, but it was not amongst the crops that was farmed by a majority of the respondents. Soja, yams and maize in this order are the other food crops generating high annual revenues for farmers over the past 12 months. The most common non timber forest products collected by farmers included karite, Nere and Baobab. For all these NTFPs women (38%, 35% and 22% respectively) were the most involved in the collection compared to men. Karite was found to be the NTFP that generated the most revenue (119252 XOF in the last 12 months) for women. The most common type of animals reared in all the studied areas include poultry, cattle and sheep. About 46% of the respondents, 41% and 48 % respectively from control and beneficiary communities do animal rearing and generate revenue from it. On average more women (47%) compared to men (45%) generate income from rearing animals. Annual average revenue derived from animal resources is estimated at about 134,584 XOF. Small business 213000 XOF and formal loans 296,688 XOF were reported to be the sources with the highest average annual income.

Knowledge about Ecosystem based adaptation: Baseline information show evidence of Ecosystem based adaptation practices in the studied communities. For example, majority of respondents practice mulching, crop diversification/intercropping, rainwater harvesting, terracing, contour ploughing use of drought resistant crops, zero tillage, as mentioned earlier average farm sizes range from 0.2-7.5ha depending on the crop. Other activities include planting of fruit trees amongst which cashew, Baobab, mangoes. Even though EbA practices are mentioned, they are only implemented by a small proportion of the communities. Other EbA practices are also carried out in forest lands such as enrichment planting and sustainable management of natural space. The baseline study shows evidence of ecosystem-based adaptation practices in the studied communes. Knowledge varied with respect to the of adaptation practice. Crop rotation and the use of chemical fertilizers were the most reported soil and water conservation practices with at least 50% of both males and females of the beneficiary and control groups each reporting the use of the two technologies. Rainwater harvesting, mulching, and composting were the other

most cited soil and water conservation practices, they were cited by at least 24% of the respondents. The least cited was zaï.

Community leaders including forest management committee, cooperatives leaders and public sector actors indicated that they are not aware of any tools or EbA strategies that may enhance their knowledge on EbA. The availability of EbA related trainings is very limited in the studied villages (8%) of respondents. Neither did the key informants had attended any such trainings. In Djougou municipality for example the agricultural officer claimed he had been trained on adaptation practices and he had also trained some members of his community on the techniques. Except for 24% of respondents who practice FMNR on Acacia farmers, were generally unfamiliar with FMNR practice "less than 4% of FMNR practices recorded''Conservation agriculture particularly zero tillage was practiced by about 42% of the respondents. More female (50%) compared to males (39%) reported practicing zero tillage

Access to community utilities relevant for adaptation: Survey results show that communities have been experimenting various adaptation strategies. The three most common adaptation related changes identified by communities included: introduction of new crop varieties, testing any new crop variety and stopping growing a crop over a season. There were no major differences between male and female respondents on this variable. Communities also reported collecting wild fruits and vegetables as survival strategy. On average, more women than men depended on wild fruits to cope during months of food shortages which generally run between June and August when the first harvest seasons begins. The most common facilities that communities have access to are water pumps and bore holes. More male headed households than females reported having access to these facilities. When segregated by municipality, the two water sources were the most reported by each municipality. These water sources can be very crucial in developing irrigation systems or in setting up nurseries. None of the respondents reported having access to community radio that can be useful for the dissemination of climate information, however 75% of the respondents had access to mobile telephones that can be used to disseminate climate information.

Tree planting initiatives : At least 57% of the respondents had planted at least one tree in the past year following data collection. Most of the farmers (29%) had planted less than 10 trees while 6.7% had planted more than 100 trees in the past year. More women (55.8 %) compared to men (38.4%) had not planted any tree (table 4.27). More farmers in the commune of Tchaourou (86.6%) and Djougou (70.5%) had planted at least one tree compared to the other communes. Banikoara is the commune with the highest number of respondents who had not planted any tree in the past year. Survey results show that at least 76% of the respondents had protected at least one tree in the past year with more men (79.5%) than women (66%) protecting trees. More farmers in Tchaourou (87%) and Djougou (86.4%) had protected at least one tree compared to farmers from any of the municipalities in the past year before the survey

Access to inputs and credits: Results of the survey show that respondents generally have problems with access to planting materials. Only 14% of the respondents declared that they produced any planting material the year before the surveys, another 9% declared that they bought some seeds. About 3.6% and 1.9 % declared they got planting material from NGOs and Government programs respectively. Tchaourou, Cobly and Djougou were the municipalities with the highest number of respondents who claimed to have produced tree planting materials. The most common inputs that farmers bought and used the previous year were herbicides, inorganic fertilizers and improved seeds reported by 75%, 34%nd 22 % of the respondents. Only 19% of the respondents had access to loans.

Social capital for adaptation and climate related risks and exposure: Discussions with key government officials of different ministerial departments and at the different municipalities including agriculture, forestry and other environmental services suggest that these staffs are not abreast with EbA practices. One in 4 staffs interviewed may be using them without knowing they are EbA. In general, the whole concept of climate change is not new to staffs at the forest, agriculture, and municipality services. Some of the staffs had received some training on climate change in school without any focus on EbA.

The staff belief the concept of EbA is new and much information exists at the central services, but this does not reach the communes. None of the forest management plans had any EbA options.

Household interviews show that about 5.6 % of all the respondents were either aware of a policy or plan(s) at national and/or local level on ecosystem-based adaptation. Women in both in the control and beneficiary group combined (8.5%) claimed to be aware of such policies than the men in both groups combined (4.5%). Respondents were asked if they aware of EbA policies, tools or had participated in similar training or any event as an individual or member of community group. Survey results show that only 8% (55 respondents) had had any of such opportunities amongst which 61% of had attended the training between 1 to 3 times. More females (68.8%) than men had participated in EbA related policy /tools trainings between 1 to 3 times compared to men (30.6 %). The baseline also collected information on farmers participation in trainings on nature-based adaptation e.g. on farm and off farm benefits of tree planting through public or private extension services in the last twelve months. Survey results show that only 7% of the respondents had participated in at least one training with more men than women participating.

Résumé exécutive

Le Fonds vert pour le climat (FVC) aide les pays en développement à renforcer leurs capacités de résilience, à réduire leurs émissions de gaz à effet de serre et à mieux s'adapter au changement climatique en apportant une contribution significative et ambitieuse aux efforts mondiaux pour atteindre les objectifs fixés par les engagements internationaux de lutte contre le changement climatique et atteindre l'objectif ultime de la convention-cadre des Nations unies sur les changements climatiques (CCNUCC). Le Bénin est l'un des pays partenaires impliqués dans une proposition de financement du Processus d'Approbation Simplifié (SAP) du FVC dans le cadre du projet « Renforcement de la résilience climatique des communautés rurales du centre et du nord du Bénin par la mise en œuvre de l'Adaptation Basée sur les Ecosystèmes (ABE) dans les paysages forestiers et agricoles » – connu au niveau national sous le nom de – Projet d'Adaptation Basée sur les Ecosystèmes (PABE).

L'objectif du projet PABE est de protéger les communautés contre les effets du changement climatique en adaptant les moyens de subsistance agricoles et en investissant dans la gestion des terres. Le projet met en œuvre des interventions clés EbA et agricoles résilientes au climat dans les sept communes suivantes du centre et du nord du Bénin : Dassa, Tchaourou, Djougou, Ouaké, Cobly, Boukoumbé et Banikoara. Faisant partie du cadre global de suivi et d'évaluation du PABE, ce rapport présente l'étude de référence consolidée menée au Bénin de septembre à décembre 2022 en utilisant l'approche pluriannuelle d'évaluation d'impact en temps réel axée sur l'apprentissage (LORTA). L'Unité d'Evaluation Indépendante (IEU) du GCF a lancé le programme LORTA dans le but principal de renforcer les capacités d'évaluation de l'impact de l'intervention du GCF. L'approche LORTA utilise des techniques d'évaluation d'impact (IE) pour aider à comprendre quelles activités fonctionnent, lesquelles sont les plus efficaces et quelles approches peuvent être mise à l'échelle. Les preuves empiriques sur les impacts des projets liés au climat sont plutôt rares.

C'est dans ce contexte que l'équipe du projet a sollicité l'appui technique de World Agroforestry (ICRAF) pour (i) réaliser l'étude de référence pour fixer la situation de référence et (ii) concevoir un plan de suivi et d'évaluation pour suivre et évaluer les résultats de l'interventions tout au long de la vie du projet. Le rapport a été élaboré en cinq grandes étapes : 1) recherche documentaire et élaboration d'un projet de méthodologie de référence, 2) réunion d'examen des outils et des indicateurs de référence, 3) élaboration et pré-validation des méthodes de collecte de données, 4) formation des enquêteurs, finalisation des outils de collecte de données et contrôle de la qualité, et 5) analyse des données et rédaction du rapport d'étude de base. Les données ont été collectées dans 666 ménages dont 495 ménages dans les sites d'intervention et 171 dans les sites témoins, à l'aide de questionnaires ménages, d'entretiens avec des informateurs clés, d'inventaire de la végétation pour collecter des données socio-économiques, agricoles, de gestion forestière et de coopératives d'agriculteurs.

Analyses des indicateurs et plan de S&E : Les indicateurs évalués étaient la liste finale des indicateurs fournis par le PABE pour le projet. Lorsqu'il s'avérait qu'un indicateur ne respectait pas les critères SMART, les critères SMART étaient reformulés en conséquence. Les résultats de l'enquête de base montrent que les hommes et les femmes dans tous les villages étudiés pratiquent déjà certaines options EbA parmi lesquelles l'agroforesterie, l'agriculture de conservation, les techniques de conservation des sols et de l'eau, l'amélioration du fourrage, l'intégration des arbres fruitiers dans les systèmes agricoles existants, etc. Ils sont également impliqués dans des activités génératrices de revenus diversifiées parmi lesquelles la collecte et la transformation des PFNL, le charbon de bois et l'apiculture. Des efforts devraient être faits pour améliorer la participation des femmes aux activités et s'assurer de leur implication effective étant donné que parce que les femmes impliquées dans les pratiques d'EbA sont moins nombreuses, d'après les résultats de l'étude. Les agriculteurs et les informateurs clés interrogées au cours de l'étude de référence confirment tous que les communautés sont exposées à plusieurs risques climatiques et à la vulnérabilité. Il s'agit notamment de précipitations irrégulières, de fortes pluies sur de courtes périodes, de sécheresses, d'inondations, de difficultés à mener des activités agricoles hors saison. L'analyse révèle une variabilité interannuelle des quantités de pluie sur la période 1971 à 2015 avec une

tendance générale à la hausse dans la zone soudano-guinéenne. Les discussions de groupe avec les agriculteurs n'ont pas suggéré l'existence de matériel ou d'outils de soutien à l'adaptation au changement climatique. Les enquêtes auprès des ménages suggèrent qu'environ 8 % des enquêtés sont au courant de certaines politiques ou plans au niveau national et/ou local sur l'adaptation basée sur les écosystèmes ou ont utilisé des ressources naturelles pour s'adapter au changement climatique, par ex. plantation d'arbres. Il est donc nécessaire de développer des matériels et des stratégies de vulgarisation qui répondent aux risques et à la vulnérabilité climatiques.

Les statistiques sur la couverture terrestre et l'utilisation des terres indiquent l'état de dégradation de chaque site du projet et permettent ainsi d'atteindre l'objectif du projet. Les résultats montrent que dans la forêt classée, il existe différentes utilisations/couvertures des terres sur lesquelles le projet peut s'appuyer pour la restauration, par exemple les unités d'aménagement de Bakou (58276,51 ha), et de Bétérou (26982,15 ha). Les données de base montrent des preuves de l'utilisation existante des pratiques EbA, y compris l'agroforesterie, la régénération Naturelle Assistée (RNA), le compostage, les cultures intercalaires, la rotation des cultures sur les terres agricoles individuelles (section 4 pour plus de détails). Les discussions avec les dirigeants des forêts communautaires indiquent qu'une partie de la forêt gérée par la communauté bénéficie également des plantations d'enrichissement, de la restauration des zones dégradées et d'autres pratiques de gestion durable. Ces activités devront être intensifiées lors de la mise en œuvre du projet PABE. L'examen des plans de gestion forestière existants révèle qu'aucun d'entre eux ne contient d'éléments d'EbA. Cependant, les discussions au sein des focus groups montrent que certains membres du comité de gestion forestière de Bakou et Bétérou de la forêt classée de l'Ouémé-Supérieure et de N'dali (OSN) avaient mis en œuvre des techniques liées à l'EbA, en particulier des activités de plantation d'arbres et de plantation d'enrichissement au cours des deux dernières années précédant la collecte de données dans différentes parties de la forêt, y compris les terres dégradées, et dans les fermes et les établissements.

Environ 57 % des groupes témoins et bénéficiaires avaient planté au moins un arbre au cours de l'année précédant la collecte des données, tandis qu'environ 43 % n'en avaient planté aucun. Plus de femmes que d'hommes n'avaient planté aucun arbre dans les groupes de contrôle et de bénéficiaires. La plupart des agriculteurs avaient contribué à protéger au moins un arbre. Il n'y avait pas de préférence quant aux espèces d'arbres plantées à des fins différentes dans les forêts dégradées, les terres agricoles et pour les plantations d'enrichissement. Il est important de prendre en considération le potentiel des agriculteurs à planter des arbres en fonction des terres disponibles et d'autres ressources. Il est également important de prendre note du taux de survie des arbres dans différents systèmes agricoles pour établir le nombre d'arbres à planter pour atteindre les objectifs du projet.

Les rendements actuels pour le maïs, le sorgho et le soja, basés sur les données de l'enquête, sont respectivement de 1,5 tonne/ha, 0,6 tonne/ha et 0,8 tonne/ha. Si les rendements du maïs sont plus proches des moyennes de la commune enregistrées en 2020 par le bureau des statistiques agricoles, ils étaient tous très faibles pour le sorgho et le soja. Pour cette raison, nous faisons référence aux rendements des principales cultures tels que fournis par le département des statistiques agricoles. Les résultats de l'enquête montrent également différentes sources de revenus parmi lesquelles l'élevage, l'agriculture et d'autres sources. Généralement, la plupart des ménages vendent entre 0 % et 100 % de leur récolte selon le produit. Pour les produits de base comme le maïs et l'igname, les agriculteurs vendent respectivement entre 40 % et 50 % de leur récolte. Pour les cultures comme l'arachide, le soja et le sorgho, les résultats de référence montrent qu'ils vendent respectivement 90 %, 80 % et 70 % de leur récolte. La transformation n'est pas courante dans tous les villages. Seuls quelques ménages pratiquent la transformation artisanale des PFNL, par exemple le néré et le karité. Les données de référence indiquent également que la plupart des ménages ont accès à la nourriture pendant 7 mois de l'année, période pendant laquelle ils dépendent de leur récolte ou pourraient acheter. Les mois les plus difficiles de l'année où il y a généralement pénurie de nourriture sont juin-août. Seules très peu de communautés dépendent des produits forestiers pour faire face aux périodes difficiles. Selon la communauté et les coutumes, certains

ménages peuvent être trop dépendants des céréales ou des tubercules, en particulier pendant les saisons de récolte.

Caractéristiques socio-économiques des enquêtés : Un total de 666 enquêtés de 7 communes ont participé à l'enquête dont 25% de femmes. Le nombre de femmes varie cependant d'une municipalité à l'autre d'un minimum de 5% à un maximum de 44%. La faible participation des femmes dans certaines communautés est largement due aux différences religieuses et culturelles qui ont empêché certaines femmes de participer à l'enquête. Dans la plupart des cas, les femmes hésitent à participer aux entretiens. Certaines des femmes étaient chefs de famille ou représentaient simplement leur mari au moment de l'interview. En moyenne, les enquêtés vivent dans le village depuis environ 34 ans +/- 17 ans. Il ne semble pas y avoir de différence significative entre le nombre d'années pour les femmes et les hommes enquêtés. Les résultats de l'enquête ont révélé que la taille moyenne des ménages pour les villages témoins et bénéficiaires était de 9 membres (+/-6 membres). La taille moyenne des ménages bénéficiaires était relativement plus élevée (10 membres) par rapport aux ménages témoins. Pour toutes les catégories d'enquêtés combinés, le total des propriétés foncières moyennes varie d'un minimum de 6,6 ha à un maximum de 10,7 ha. Les hommes avaient généralement des terres plus grandes (10,8 ha) que les femmes (5,4 ha). Une analyse plus approfondie montre que certains enquêtés de Ouaké ont enregistré les plus petites propriétés foncières par rapport aux autres communes, par exemple Dassa-Zoumè 11,7 ha. La superficie et la taille des terres sont importantes car elles peuvent déterminer le type de pratiques EbA qu'un ménage donné peut adopter. Les résultats de l'enquête montrent que les terres agricoles des enquêtés pouvaient se trouver à l'intérieur ou à l'extérieur de la forêt. La plupart des enquêtés avaient des terres à l'extérieur ou autour de la forêt tandis que 11% avaient des terres agricoles à l'intérieur de la forêt. Plus d'agriculteurs à Tchaourou (26,8%) et Djougou (47,7%) avaient des terres agricoles à l'intérieur de la forêt classée par rapport à leurs pairs des autres communes qui ne possèdent pas de terres agricoles dans les forêts communautaires. Plus d'hommes (28%) que de femmes (20%) avaient des terres agricoles à l'intérieur de la forêt. Quels que soient le sexe, la commune ou la typologie des enquêtés, le mode d'acquisition foncière le plus courant est l'héritage. Plus d'hommes (55%) que de femmes 38% avaient des plantations d'arbres. Seule une très faible proportion des deux sexes 6% utilisent une partie de leur terre comme pâturage. Un bon nombre (31%) pouvaient accéder à la terre en défrichant simplement la forêt puisqu'elle était considérée comme une terre communautaire/communale. La plupart des agriculteurs ont déclaré que leurs terres étaient soit des zones boisées (36,7%) soit des zones forestières (32%) lorsqu'ils les ont acquises. Plus de femmes interrogées (42%) ont affirmé que leurs terres étaient des terres boisées par rapport aux hommes et plus d'hommes (34,5%) ont affirmé que leurs terres étaient des terres forestières par rapport aux femmes 24,8%. La plupart des agriculteurs (62%) affirment que leurs terres sont en phase de dégradation et plus d'hommes (64,3%) que de femmes (55,2%) ont signalé des cas de dégradation des terres. La perception de la dégradation des terres variait entre les municipalités avec le plus grand nombre de cas signalés à Djougou, Boukombé et Ouaké dans cet ordre. Les enquêtés ont signalé plusieurs raisons pour l'augmentation de la dégradation des sols. Le plus cité par les hommes et les femmes interrogés (67%) était les mauvaises pratiques agricoles.

Sources de nourriture et de revenus : Les discussions avec les dirigeants des coopératives de l'étude de cas indiquent que seulement 2 des 14 coopératives de l'étude de cas ont une forme quelconque de contrat commercial avec les acheteurs. Certaines coopératives ont des contrats informels avec des acheteurs, par exemple le groupe Suru tcheka à Djougou vend du Néré à des acheteurs du Niger par le biais de contrats informels basés sur la confiance. Il sera important de voir combien de nouveaux contrats seront engagés par ces coopératives et de voir la taille des revenus générés par ces coopératives croître. Les données de référence montrent que certaines des coopératives ont généré des revenus au cours de la dernière année tandis que d'autres n'en ont généré aucun. Le maïs et l'igname étaient les cultures les plus courantes cultivées par la majorité des ménages, au moins 83 %. La noix de cajou était la culture arboricole la plus citée cultivée par au moins 20 % des enquêtés. Il a été constaté que plus d'hommes que de femmes étaient impliqués dans la culture de l'igname et de la noix de cajou par rapport au maïs où les différences n'étaient pas très significatives. Le coton s'est avéré générer le revenu annuel moyen

le plus élevé au cours des 12 derniers mois, mais il ne faisait pas partie des cultures cultivées par la majorité des enquêtés. Le soja, l'igname et le maïs dans cet ordre sont les autres cultures vivrières générant des revenus annuels élevés pour les agriculteurs au cours des 12 derniers mois. Les produits forestiers non ligneux les plus courants collectés par les agriculteurs étaient le karité, le néré et le baobab. Pour tous ces PFNL, les femmes (respectivement 38%, 35% et 22%) ont été les plus impliquées dans la collecte par rapport aux hommes. Le karité s'est avérée être le PFNL qui a généré le plus de revenus (119252 XOF au cours des 12 derniers mois) pour les femmes. Le type le plus courant d'animaux élevés dans toutes les zones étudiées comprend la volaille, les bovins et les ovins. Environ 46% des enquêtés, respectivement 41% et 48% des communautés témoins et bénéficiaires pratiquent l'élevage et en tirent des revenus. En moyenne, plus de femmes (47 %) que d'hommes (45 %) tirent des revenus de l'élevage d'animaux. Le revenu annuel moyen tiré des ressources animales est estimé à environ 134 584 XOF. Les petites entreprises 213 000 XOF et les prêts formels 296 688 XOF ont été signalés comme étant les sources avec le revenu annuel moyen le plus élevé.

Connaissances sur l'adaptation basée sur l'écosystème : les informations de base montrent des preuves de pratiques d'adaptation basées sur l'écosystème dans les communautés étudiées. Par exemple, la majorité des enquêtés pratiquent le paillage, la diversification des cultures/les cultures intercalaires, la collecte des eaux de pluie, le terrassement, le labour en courbes de niveau, l'utilisation de cultures résistantes à la sécheresse, le travail du sol sans labour, comme mentionné précédemment, la taille moyenne des exploitations varie de 0,2 à 7,5 ha selon la culture. D'autres activités comprennent la plantation d'arbres fruitiers parmi lesquels l'anacardier, le Baobab, les manguiers. Même si les pratiques EbA sont mentionnées, elles ne sont mises en œuvre que par une faible proportion des communautés. D'autres pratiques EbA sont également menées dans les terres forestières telles que la plantation d'enrichissement et la gestion durable de l'espace naturel. L'étude de base montre des preuves de pratiques d'adaptation basées sur les écosystèmes dans les communes étudiées. Les connaissances varient en ce qui concerne les pratiques d'adaptation. La rotation des cultures et l'utilisation d'engrais chimiques étaient les pratiques de conservation des sols et de l'eau les plus signalées, avec au moins 50 % des hommes et des femmes des groupes bénéficiaires et témoins ayant chacun déclaré l'utilisation des deux technologies. La collecte des eaux de pluie, le paillage et le compostage étaient les autres pratiques de conservation des sols et de l'eau les plus citées, elles ont été citées par au moins 24 % des enquêtés. Le moins cité était le zaï.

Les dirigeants communautaires, y compris le comité de gestion forestière, les dirigeants de coopératives et les acteurs du secteur public, ont indiqué qu'ils n'étaient au courant d'aucun outil ou stratégie d'EbA susceptible d'améliorer leurs connaissances sur l'EbA. La disponibilité des formations liées à l'EbA est très limitée dans les villages étudiés (8%) des enquêtés. Les informateurs clés n'avaient pas non plus assisté à de telles formations. Dans la municipalité de Djougou par exemple, l'agent agricole a affirmé qu'il avait été formé sur les pratiques d'adaptation et qu'il avait également formé certains membres de sa communauté sur les techniques. Les agriculteurs n'étaient généralement pas familiers avec les pratiques fourragères et ne connaissaient pas la Régénération Naturelle Assistée (RNA). À l'exception de 24 % des répondants qui pratiquent la FMNR sur l'Acacia, les agriculteurs n'étaient généralement pas familiers avec la pratique de la FMNR "moins de 4 % des pratiques de FMNR enregistrées". L'agriculture de conservation, en particulier la culture sans labour, était pratiquée par environ 42 % des enquêtés. Plus de femmes (50 %) que d'hommes (39 %) ont déclaré pratiquer la culture sans labour.

Accès aux services collectifs pertinents pour l'adaptation : Les résultats de l'enquête montrent que les communautés ont expérimenté diverses stratégies d'adaptation. Les trois changements les plus courants liés à l'adaptation identifiés par les communautés comprenaient : l'introduction de nouvelles variétés de cultures, le test de toute nouvelle variété de cultures et l'arrêt de la culture d'une culture pendant une saison. Il n'y avait pas de différences majeures entre les enquêtés masculins et féminins sur cette variable. Les communautés ont également signalé la cueillette de fruits et légumes sauvages comme stratégie de survie. En moyenne, plus de femmes que d'hommes dépendaient des fruits sauvages pour faire face pendant les mois de pénurie alimentaire qui se déroulent généralement entre juin et août,

lorsque la première saison de récolte commence. Les installations les plus courantes auxquelles les communautés ont accès sont les pompes à eau et les forages. Plus de ménages dirigés par des hommes que de femmes ont déclaré avoir accès à ces installations. Lorsqu'elles sont séparées par municipalité, les deux sources d'eau ont été les plus signalées par chaque municipalité. Ces sources d'eau peuvent être très cruciales dans le développement de systèmes d'irrigation ou dans la mise en place de pépinières. Aucun des enquêtés n'a déclaré avoir accès à une radio communautaire qui peut être utile pour la diffusion d'informations climatiques, cependant 75% des enquêtés avaient accès à des téléphones portables qui peuvent être utilisés pour diffuser des informations climatiques.

Initiatives de plantation d'arbres : Au moins 57 % des enquêtés avaient planté au moins un arbre au cours de l'année écoulée suite à la collecte des données. La plupart des agriculteurs (29%) avaient planté moins de 10 arbres tandis que 6,7% avaient planté plus de 100 arbres au cours de l'année écoulée. Plus de femmes (55,8 %) que d'hommes (38,4 %) n'avaient planté aucun arbre (tableau 4.27). Plus d'agriculteurs dans la commune de Tchaourou (86,6%) et Djougou (70,5%) avaient planté au moins un arbre par rapport aux autres communes. Banikoara est la commune qui compte le plus grand nombre d'enquêtés n'ayant planté aucun arbre au cours de l'année écoulée. Les résultats de l'enquête montrent qu'au moins 76 % des enquêtés ont protégé au moins un arbre au cours de l'année écoulée, avec plus d'hommes (79,5 %) que de femmes (66 %) protégeant les arbres. Plus d'agriculteurs à Tchaourou (87%) et Djougou (86,4%) avaient protégé au moins un arbre par rapport aux agriculteurs de l'une des municipalités au cours de l'année précédant l'enquête.

Accès aux intrants et aux crédits : Les résultats de l'enquête montrent que les enquêtés ont généralement des problèmes d'accès au matériel de plantation. Seuls 14% des enquêtés ont déclaré avoir produit du matériel de plantation l'année précédant les enquêtes, 9% ont déclaré avoir acheté des semences. Environ 3,6% et 1,9% ont déclaré avoir obtenu du matériel de plantation des ONG et des programmes gouvernementaux respectivement. Tchaourou, Cobly et Djougou étaient les municipalités avec le plus grand nombre de enquêtés qui ont déclaré avoir produit du matériel de plantation d'arbres. Les intrants les plus courants que les agriculteurs ont achetés et utilisés l'année précédente étaient les herbicides, les engrais minéraux et les semences améliorées signalés par 75 %, 34 % et 22 % des enquêtés. Seuls 19 % des enquêtés avaient accès à des prêts.

Capital social pour l'adaptation et les risques et expositions liés au climat : Des discussions avec des responsables gouvernementaux clés de différents départements ministériels et de différentes municipalités, y compris l'agriculture, la foresterie et d'autres services environnementaux, suggèrent que ces personnels ne sont pas au courant des pratiques d'EbA. Un membre du personnel interrogé sur 4 peut les utiliser sans savoir qu'il s'agit d'EbA. En général, tout le concept de changement climatique n'est pas nouveau pour le personnel des services forestiers, agricoles et municipaux. Certains membres du personnel avaient reçu une formation sur le changement climatique à l'école sans se concentrer sur l'EbA. Le personnel pense que le concept d'EbA est nouveau et que beaucoup d'informations existent au niveau des services centraux, mais cela n'atteint pas les communes. Aucun des plans de gestion forestière n'avait d'options EbA.

Les entretiens avec les ménages montrent qu'environ 5,6 % de tous les enquêtés étaient au courant d'une politique ou d'un ou plusieurs plans au niveau national et/ou local sur l'adaptation basée sur les écosystèmes. Les femmes des groupes témoin et bénéficiaire combinés (8,5 %) ont affirmé être au courant de ces politiques que les hommes des deux groupes combinés (4,5 %). Il a été demandé aux enquêtés s'ils connaissaient les politiques et les outils d'EbA ou s'ils avaient participé à une formation similaire ou à tout événement en tant qu'individu ou membre d'un groupe communautaire. Les résultats de l'enquête montrent que seuls 8 % (55 enquêtés) ont eu l'une de ces opportunités, dont 61 % ont suivi la formation entre 1 et 3 fois. Plus de femmes (68,8 %) que d'hommes ont participé à des formations sur les politiques/outils liés à l'EbA entre 1 et 3 fois par rapport aux hommes (30,6 %). La base de référence a également collecté des informations sur la participation des agriculteurs aux formations sur l'adaptation basée sur la nature, par ex. avantages à la ferme et hors ferme de la plantation d'arbres par le biais de

services de vulgarisation publics ou privés au cours des douze derniers mois. Les résultats de l'enquête montrent que seulement 7% des enquêtés ont participé à au moins une formation avec plus d'hommes que de femmes.

1. INTRODUCTION

Climate change impacts on food security, livelihoods and ecosystems are already alarming and affecting millions of smallholder farmers in sub-Saharan Africa as well as ecosystems services in the region. With increased frequency and severity of extreme events such as floods, droughts, heat conditions and over dependence on rainfed agriculture, there is a growing agricultural productivity crisis, dwindling household food availability and the economic prosperity of countries whose national economies are dependent on agriculture. Considering that climate change impacts are felt differently within regions, context-specific adaptation measures, including ecosystem-based solutions, are required to reduce risks, build adaptive capacity of smallholder farmers and increase ecosystems services for improving livelihoods of vulnerable communities.

Benin, like other countries in sub-Saharan Africa, faces the challenges of environmental degradation and climate change impacts issues. The country must find solutions to several challenges such as the degradation and loss of land, forests and natural habitats which have become obstacles to the country's development efforts in the current context increasingly marked by climate change.

Thus, while Benin strives to boost its economic growth and overcome poverty, the effects of climate change could further increase its vulnerability to poverty. It should be noted that drought, floods and changes in the rainfall regime are the main risks facing the country. In addition, studies have shown that by 2100, in northern Benin, there will be a temperature increase of 2.6°C to 3.27°C. All these various phenomena have led over the past three decades to substantial losses in the sectors of agriculture, health, water resources, infrastructure, energy and forestry. These recorded losses impact the Benin's economy which is essentially based on agriculture. Indeed, Beninese Agriculture provides about 80% of export earnings and supports some 70% of the population. It is characterized by forest resources and agricultural lands that provide important services of considerable economic value to the country. Climate change poses a serious threat to agricultural production systems and the well-being of these populations. Climate change increases the vulnerability of agro-ecosystems and human systems, exacerbating the problems of hunger, malnutrition and poverty.

In the agricultural sector, the combined effects of climate change have resulted in a decline in agricultural productivity which is already 10% lower than ten (10) years ago and the persistence of approximately 15% of rural households. in severe food and nutrition insecurity. The poorest and most vulnerable households to the impacts of climate change derive their livelihoods from the exploitation of forest and agricultural landscapes, which unfortunately are very degraded due to unsustainable land and forest management practices in some localities from the Center to the North.

With such alarming statistics, Benin government has identified several adaptation actions. Among other actions, it is noted the investment in climate-resilient agriculture through an EbA approach (Ecosystem-based Adaptation) for the restoration and management of forests and land. This approach essentially consists of developing appropriate mechanisms to carry out structuring investments in the management of forests and adjacent agricultural lands in central and northern Benin. This commitment of the Government of Benin for the survival of the most vulnerable populations has received a favorable response from the Green Climate Fund (GCF) which, through the establishment of a grant, supports through UNEP, the realization of the Ecosystem-based Adaptation project (PABE).

The objective of the Ecosystem-Based Adaptation Project is to protect communities from the adverse effects of climate change by adapting agricultural livelihoods and investing in land management. Climate-resilient agricultural interventions will be implemented in the following seven municipalities in central and northern Benin: Dassa-Zoumè, Tchaourou, Djougou, Ouaké, Cobly, Boukoumbé and Banikoara. More specifically, the ecosystems concerned are the agroforestry landscapes which are: Community Forests (CF) of Déroubou in Banikoara; Salangwa in Ouaké; Katenga in Boukoumbé; Didani in Cobly and Bètècoucou in Dassa-Zoumè and Forest Management Units of Bakou and Bétérou in Protected forest of Ouémé Supérieur-N'Dali (OSN) in Djougou and Tchaourou.

For the success of the implementation, PABE have requested the technical assistance of ICRAF. The overall objective of ICRAF's technical support as International Technical Assistance (ITA) is to provide strategic and operational guidance in the implementation of specific project activities (Activities 111; 112, 121, 311 and 313) by working in direct collaboration with the Project Management Unit (PMU), national and international consultants, as well as other project partners. This will involve the establishment of International Technical Assistance for direct and continuous support to the PMU through a Principal Technical Advisor (PTA) over the total duration of the project, and specific thematic technical assistance that could be redefined from time to time according to the evolution of the project and the realities on the ground.

This report presents a baseline/diagnostic assessment of the project, it provides a reference situation of the agricultural and forest landscapes dynamics in the seven (7) municipalities.

1.1 Background and context

Climate change represents an undeniable challenge for the world in general and for Africa in particular. Faced with their threats, The Government of Benin requested and obtained, by approval decision of the Council of the Green Climate Fund (GCF) through UNEP, the financing of the Ecosystem-Based Adaptation Project (PABE). The Project is aimed at improving the Resilience of Rural Communities in the North and Centre Benin by implementing Ecosystem-Based Adaptation Measures in Forest and Agricultural Landscapes, also referred to as the "Ecosystem-Based Adaptation Project - EbA". The project will specifically target seven municipalities in central and northern Benin: Dassa-Zoumè, Tchaourou, Djougou, Ouaké, Cobly, Boukoumbé and Banikoara. The specificity of the project is its implementation approach – based on the principles of Ecosystem Based Adaptation (EBA), the restoration of ecosystems the reorganization of supply and demand for ecosystem services with emphases on strengthening the adaptative capacity of rural communities. During the project life cycle, three evaluations are planned: i) baseline/diagnostic assessment, to provide a reference situation of the agricultural and forest landscapes dynamics in seven (7) municipalities, ii) midterm, to assess progress towards impact and iii) end term to measure the impact of the project. The last two assessments must refer to the reference situation or the baseline at the start of the project.

The PABE project sees the baseline study and the monitoring and evaluation (M&E) framework as essential steps in managing the process of assessing and reporting progress towards achievement of results and outputs. The main objective of the M&E framework is to provide a conceptual basis and methodology for monitoring and evaluation and to describe the tools that will be used to facilitate information gathering and reporting. The M&E framework therefore mainly aims to provide an overview and an operational mechanism for M&E with different requirements and responsibilities that fits with GCF's requirements.

It is within this context that the PABE project solicited the services of World agroforestry to (i) carry out the baseline study to set the reference situation and (ii) develop a monitoring and evaluation plan to track and assess the results of the interventions throughout the life of the project.

The overall objective of PABE is to protect communities from the effects of climate change by adapting agricultural livelihoods and investing in land management. This overall objective is broken down into three Specific Objectives (SO) as shown in table 1.1

Table 1.1 : Outcomes and outputs of PABE

Specific Objectives (SO)	Expected Results
OS 1: SO1. 3,600 hectares of land restored for multiple energy and livelihood uses	Outcome 1.1 Seven forest management plans are revised or developed and put into practice by community forest management committees, to include EbA and climate resilient sustainable forest management practices.

Specific Objectives (SO)	Expected Results
	Outcome 1.2 Land is reforested to mitigate the effects of climate change such as flooding and soil erosion, and to improve the supply of non-timber forest products (NTFPs) such as fruits, medicines, nuts, firewood and fibers.
SO 2: Increase productivity through protection of agricultural livelihoods against climate change	Outcome 2.1 Interventions in favour of agriculture resilient to climate change increase agricultural yields under conditions of climate change, implemented on 3,000 hectares.
	Outcome 2.2 Creation of market access for climate resilient crops to support the adoption of EbA by target groups
SO 3: Strengthen the technical and institutional capacities of government and communities for the implementation of climate-resilient agriculture (EbA) and increased awareness of the benefits of adaptation	Outcome 3.1 Tools, instruments and strategies are developed and implemented to enable communities, businesses and the public sector to respond to climate change and variability

1.2. Ecosystem based adaptation in Benin

Ecosystem-based adaptation (EbA) is "the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change" (Convention on Biological Diversity [CBD] 2009). In 2014, the United Nations Environment Assembly (UNEA) adopted Resolution 1/8 which requests UNEP, in partnership with governments and other stakeholders, develop and implement EbA programs and encourages all countries to include EbA in their policies (UNDP 2015).
The advantages of the ecosystem-based approach to adaptation are:

- Use of compost, simple crop rotation systems, cover crops and legumes improving agricultural productivity;
- Reduced pressure on surrounding ecosystems such as forests;
- Protection of biodiversity at the local level;
- Strengthening the resilience of crops and livestock to climate change;
- Broader source of crop resilience to uncertain effects of extreme weather events;
- Diversification of agricultural production systems and sources of income for local communities;
- Farmers more likely to support reforestation activities and protect forest areas when they benefit directly.

The EbA approach is conceived along three main dimensions:

Dimension 1: Ecosystemic

- Conserve the function, structure and species composition of ecosystems, recognizing that all components are interconnected;
- Strengthen and assist the recovery of ecosystems that have been degraded, damaged or destroyed; and
- Manage resources in ways that promote the long-term sustainability of ecosystems and the continued provision of essential ecosystem services to society.

Dimension 2: Benefits of adaptation

- Maintain or improve the productivity of crops, livestock or farms in the face of climate change;
- Reduce the biophysical impacts of extreme weather events on crops, animals or agricultural systems; and
- Reduce the risk of crop diseases and pests due to climate change.

Dimension 3: Livelihood security

- Strengthen the food security of smallholder households;
- Increase or diversify the income-generating activities of smallholders;
- Take advantage of traditional or local knowledge of smallholder farmers;
- Use local, available and renewable inputs; and
- Promote lower implementation costs and affordable labour for smallholder farmers.

The implementation of the EbA approach often faces several obstacles including:

- Limited technical capacity within government and local communities to implement an EbA approach and thereby demonstrate the economic and climate change adaptation benefits of this approach;
- Limited integration of adaptation to climate change in development planning at the local level;
- Limited information and knowledge on the risks and impacts of climate change on ecosystems and appropriate interventions.
- Limited geographic scope and demographic coverage of climate change adaptation projects;
- Limited knowledge of the ecological and economic benefits of the EbA approach to sustainable forest management by local communities and governments; and
- Uncertainties about forest ownership and forest law enforcement.

Benin finalized its national climate change adaptation plan in 2022. The diagnostic studies carried out clearly show that Benin is particularly vulnerable to climate change like most developing countries. All socioeconomic and biophysical sectors of the country are affected. These are essentially agriculture, water resources, energy, health, infrastructure and urban planning, tourism, forestry and the coast. To deal with the vulnerability of these sectors, the Government of Benin intends to include in the long term the economic analysis of the impacts of climate change adaption in the budgetary processes. In addition, particular emphasis was placed on the relationship to gender, endogenous adaptation knowledge and migration, the consideration of which would contribute to the sustainability of the recommended adaptation measures. The National Adaptation Plan[1] considers the ecosystem-based approach to adaptation as one of its guiding principles and identifies implementation pathways that strengthen the resilience of biodiversity and ecosystem resources through a systemic approach to adaptation with respect to natural capital.

1.3. General objectives of the assignment

The general objective of the assignment is two folds: (i) carry out a baseline study for the PABE project and (ii) set up a monitoring and evaluation plan for the same.

The baseline will serve as the starting point in monitoring results and implementation outcomes. The baseline will be designed to include environmental, biodiversity, socio-economic, ethnographic as well as gender-related elements aimed at improving the gender strategy of the project in 7 selected community and classified forest. The baseline begins with the identification of indicators for the baseline study and for monitoring and evaluation.

The specific objectives of the assignment include:

i) Selecting indicators and establishing the baseline[2]:
ii) Assess the project results framework and propose any specific revisions to project activities, outputs and outcomes, risks and assumptions;

[1] https://unfccc.int/sites/default/files/resource/PNA_BENIN_2022_0.pdf

[2] The project indicators defined in the SAP0005 - https://www.greenclimate.fund/sites/default/files/document/funding-proposal-sap005-unep-benin.pdf document and LORTA framework have been reviewed and updated jointly with CIFOR-ICRAF and PABE project team in consultation with UNEP.

iii) Assess and describe status of each of the indicators based on project log frame and theory of change, validate and/or use of EbA and SMART (Specific, Measurable, Achievable, Realistic and Timely) criteria to revise or further develop the indicators and targets for each of the revised outcomes and output according to the project theory of change and log frame, and
iv) Develop a monitoring and evaluation plan for the project including, data collection tools and a description of the methodology to be used to obtain values for each main output, including indicator for mid and end term evaluation.

1.4. Main outputs and deliverables of the baseline and M&E plan

i) A revised project results framework and indicators.
ii) Baseline draft report with description of baseline methodology for control and treatment groups, and baseline data based on agreed upon indicators disaggregated by gender and for each of the 5 community forests and 2 classified forests.
iii) A monitoring and evaluation plan

2. METHODOLOGY

This section of the report describes the approach that was used to collect and analyse the baseline data. It also describes the study sites and sampling techniques; the data collection tools and the respondents.

2.1. Broad description of the baseline approach

Figure 2.1 gives a general overview of the steps and approaches that were adopted in conducting the baseline study.

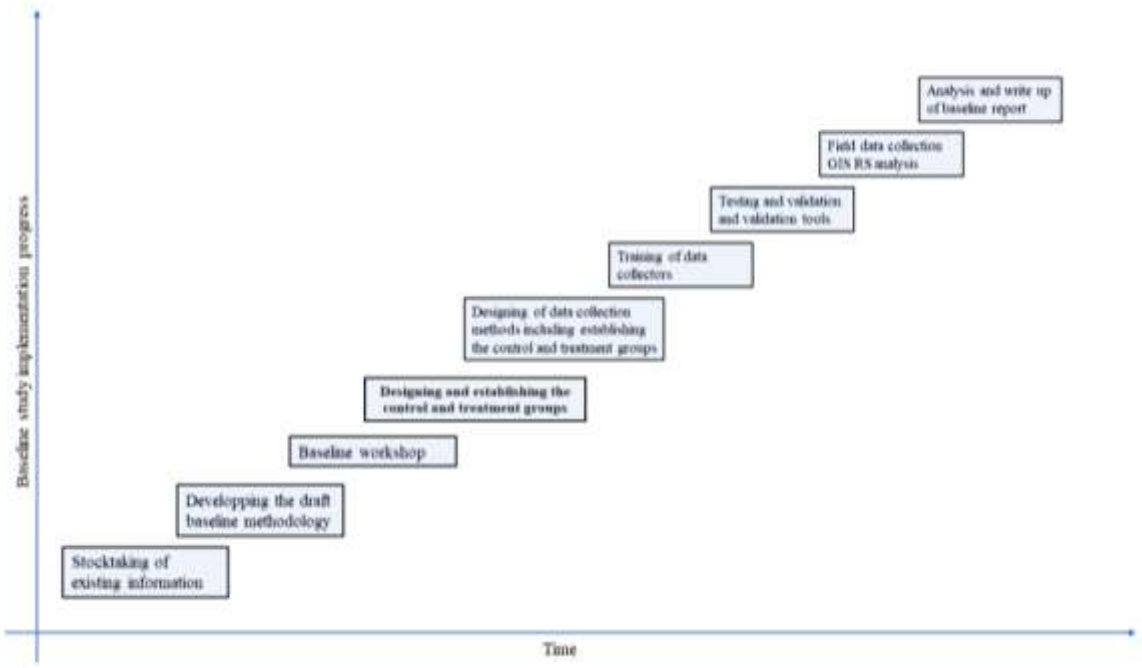


Figure 2. 1: Implementation steps for the baseline study

Step 1. Desk review and development of a draft baseline methodology
This included a desk review of project documents including results/logical framework, all key performance indicators, conceptual framework, and the LORTA approach (see section 2.2 for details about LORTA). At this stage, we focused on collecting all necessary information, including exploitation of feasibility studies carried out during the development phases of the project proposal. The desk review also permitted us to explore existing literature, reports and other secondary data that were significant in acquiring information that were not sufficiently captured during the feasibility studies. To some extent, this information helped to triangulate information available and relevant to the project. From such a diverse set of data/information we refined the draft methodology and included elements specific to the LORTA approach. Results of the desk review include:

- Proposed revised project outputs.
- Proposed revised set of output indicators.
- Proposed revised outcome indicators ensuring they are SMART

Step 2. Baseline tools and indicators review meeting
An online and a physical work was organized between ICRAF and staffs of PABE between January and May 2022. The objectives of the workshops were to:

- Harmonize understanding of the objectives of the baseline and monitoring and evaluation activities of the project, particularly between the different actors with roles or issues in the process
- Review the proposed indicators and identify the most relevant, effective, and appropriate set of indicators using SMART and EbA criteria,
- Discuss and agree on the proposed methodology specifically data collection tools, sampling of villages and respondents.
- Brainstorm ideas and share other relevant knowledge and experience

Step 3. Development and pre-validation of data collection methods

Once the indicators were agreed and the work plan developed, the data collection methods was developed. It consisted of rapid appraisal techniques considered efficient to effectively reduce costs while capturing credible data on selected villages and community and classified forests included in this project. Spatial analysis was for example used to collect information on land use and land cover. Participatory approaches were used to collect social, economic, and environmental information from members of the selected community and classified using interview guides and focus groups. The research design used the LORTA approach sampling the communities and respondents (see section 2.2 for details about LORTA)

Step 4. Training of investigators, finalization of data collection tools and quality control

To ensure quality data, three data collection teams were constituted and trained on the methodological approach and the data collection tools. The teams were trained in advance to better familiarize themselves with the tools to be used. Besides the content of the data collections tools, they were also trained to use the Open Data Kit (ODK) that was used to collect relevant data. The training of interviewers also allowed us to test and verify the clarity of the tools. All technical terms were translated into local languages or their explanations in local languages were agreed upon. Quality control was further ensured through close supervision of the trained enumerators by team leaders who were ICRAF or PABE staffs.

Step 5. Data analysis and writing of the baseline study report

The main activity was to analyse the collected data and produce the baseline survey report. The results reported at this stage on the specified indicators will be used as benchmarks for comparison during and even after project implementation. For these analyses, we used basic descriptive statistics, by examining the measures of central tendency (mean or median, or mode), the standard deviation and the standard error wherever necessary were also used to describe the summary statistics. In addition, univariate, bivariate and multivariate analyses were deployed to appreciate the distribution, relationships and prediction of important variables related to project performance indicators in different socio-cultural and environmental contexts.

Table 2.1: Summary of methodological approach

Activity /Task	Approach	Comments
i)Assess the project results framework and propose any specific revisions to project activities, outputs and outcomes, risks and assumptions	• Literature review, including project documents and project inception report with specific attention to theory of change and logical framework, • Consultation workshop Participatory process including discussions with project management team/actors in the relevant ministry to validate the revisions made in the project activities, outputs and outcomes	: • log frame and theory of change were discussed this with PABE team in two online meetings • project indicators were evaluated using SMART criteria.

Activity /Task	Approach	Comments
ii) Assess and describe status of each of the indicators, and ensure they are SMART respect LORTA process	This was done in two online meetings and prior to data collection with the PABE team	
iii) Establish the sampling plan for the control and treatment groups (details in section 2.2.3)	• The quasi-experimental design was used. • Treatments were measured at different levels (Forest management units and community forest at the first level and the households at the second level)	• Completed
iii) Field surveys for baseline data collection	• Focus group discussions with mixed gender groups, two separate focus group discussion with cattle grazers and women • Key informant interviews with municipalities, community forest management • Forest officers, Agric officers • Review literature at municipal levels • Interviews with farmer group leaders if any	• Some data at household and community forest levels including vegetation data were collected during a survey to identify EbA practices and where necessary will be referred to
iv) Identify data gaps and agree with PABE team and on a methodology to fill in the data gaps	• Discussions were held with PABE team to discuss existing data gaps that could not be collected through lit review, field surveys and GIS e.g. specific details about land use and degradation in each community forest	• Completed
v) Development of a monitoring and evaluation plan	• Workshop with PABE ministry and other stakeholders	• Outline defined, some sections completed lacking: M&E data collection sheet for each indicator, methodology for collecting Monitoring data, budget etc

2.2. Adapting the LORTA approach

A detail description of the quasi-experimental design and presented in section 2.2.3. Being an ecosystem-based adaptation project financed by GCF, we adapted the method used by the Learning-Oriented Real-Time Impact Assessment (LORTA)[3,4] programme. LORTA employs state-of the art rigorous theory based on counterfactual methods to measure change and to mainstream real-time learning into project financed by GCF. The general objective of LORTA is to:

- Measure the overall change (outcome or impact) of GCF's funded projects and enhance learning.
- Understand and measure results at different parts of theories of change.
- Measure GCF's overall contribution to catalyse a paradigm shift and achieve impacts at scale.

The LORTA methodology uses experimental and non-experimental or quasi-experimental design approaches to track project impacts in real-time. In the case of the PABE project, the quasi-experimental design was used because it is not possible to randomize the classified forests and the communities surrounding the forests and the members of the community to treatment and control groups. In other words, the choice of the community forests and the concerned villages where PABE is implemented

[3] https://ieu.greenclimate.fund/evaluation/lorta
[4] https://ieu.greenclimate.fund/sites/default/files/evaluation/lorta-approach-paper-summary.pdf

was guided by project objectives amongst which the selected municipalities where the project is implemented and the kind of EbA options to be implemented in each municipality and or village.

Treatments were measured at different levels:

a) Forests: (i) two classified forests and (ii) five community forests

b) Households in selected villages living in and around the two types of forests.

After having selected the households living in and around the two typologies of forests, the quasi-experimental design approach ensured that we identify comparison groups that are similar as possible to the treatment groups in terms of baseline characteristics. In this regard we selected treatment and control groups that are balanced. That is for each community forests and the hosting community we chose another community forests in, another site in a different municipality as control. Difference-in-difference approach will be used to compare the changes in outcome over time between the treatment and comparison groups to estimate impact. The intervention and comparison groups will be matched on key characteristics using propensity score matching (PSM), to ensure that they are otherwise as similar as possible.

2.3. Sample sizes

We selected villages from each of the seven participating municipalities that are representative of the surrounding communities that exploit the forest and forest resources. A total of 60 beneficiary and 30 control households were randomly selected from each municipality. Taking into consideration the small number of households per village, we targeted about 3 beneficiary villages per municipality and one control village. The villages were chosen to capture variability in resources use, project interventions and consequently influences on the forest. Taking into consideration the expected beneficiary of 3600 households, the minimum expected for a 95% CI was 378 households. In all, 495 beneficiary households and 171 control were interviewed, which is largely above the minimum expected. Table 1.2 summarizes the sampling design.

The project employed gender sensitive approaches by ensuring that at least 40% of the sample were women. In almost all the communities it was difficult to reach this number because of cultural barriers that made a majority of the women to shy away from participating in the interviews. Efforts were made to include women enumerators in all the data collection. Data was collected either early in the morning or in the evening when farmers were free, as such we did not interfere with their daily chores.

Table 2.2: Summary of sampling design

Municipality	Arrondiss-ement	Villages	Beneficiary or Control	Number of respondents
Tchaourou	Bétérou	Kpessou	Beneficiary	26
		Oubérou		19
		Sinanhou		23
	Sanson	Barerou	Control	30
Total Tchaourou				**98**
Djougou	Onklou	Bakou	Beneficiary	34
		Daringa		31
	Barienou	Toko-Toko	Control	24
Total Djougou				**89**
Dassa-Zoumè	Akofodjoule	Agonkpinzin	Beneficiary	11
		Betecoucou		28
		N'gbega		11
	Atinkpaye	Atinkpaye		15
	Tre	Lema-Tre	Control	33
Total Dassa-Zoumè				**98**

Municipality	Arrondiss-ement	Villages	Beneficiary or Control	Number of respondents
Banikoara	Gomparou	Alibori	Beneficiary	10
	Banikoara	Tokey-Banta		32
	Somperekou	Déroubou		29
		Gnindarou	Control	20
Total Banikoara				**91**
Cobly	Cobly	Bagapody	Beneficiary	28
		Didani		24
		Nouangou		9
		Cobly centre		3
	Tapoga	Tapoga	Control	27
Total Cobly				**91**
Boukoumbé	Nata	Koudogou	Beneficiary	33
		Kouporgou		29
		Kouwotchirgou		2
	Boukoumbe	Koussogou		28
		Koutatiegou	Control	4
Total Boukoumbé				**96**
Ouaké	Ouake	Alayomde	Beneficiary	23
	Komde	Oloude		6
		Yamsale		41
	Badjoude	Badjoude	Control	33
Total Ouaké				**103**
Grand Total				**666**

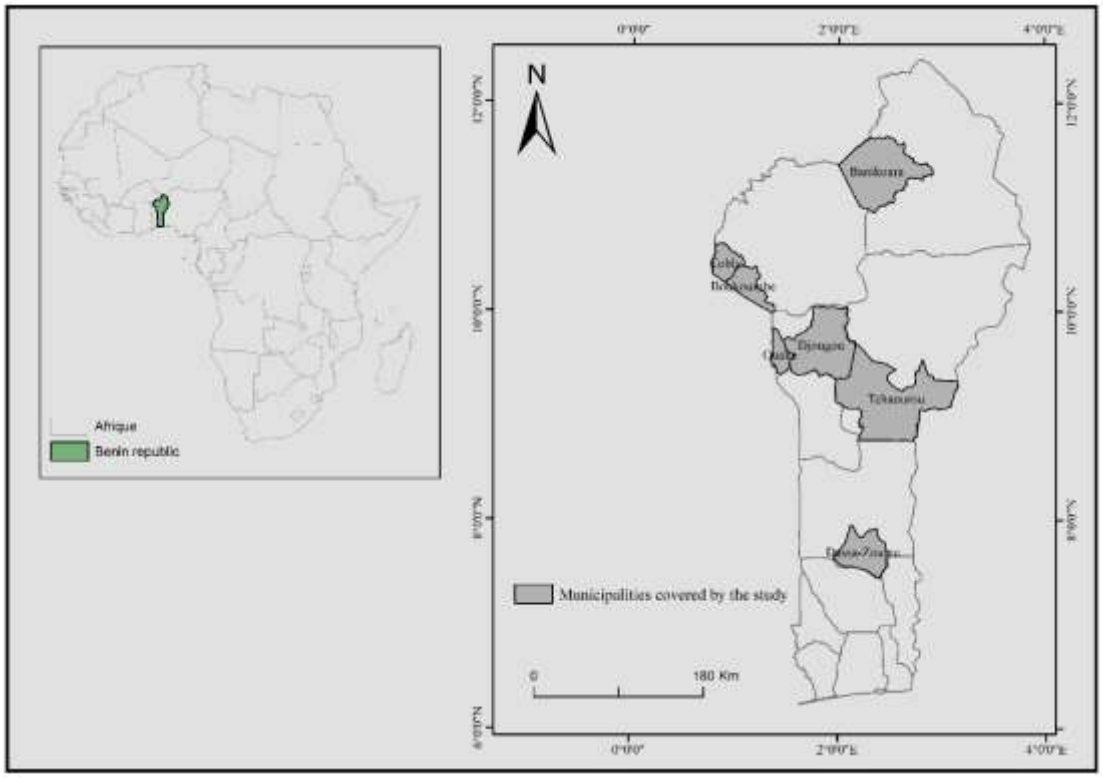


Figure 2. 2: Map of Benin republic with municipalities covered by the sudy

2.4. Typology of data and data collection tools

- Household questionnaires: This included demography and livelihoods characteristics, climate-related shocks, resilience strategies, ambitions for tree planting accompanied by preferences for species, types of support received to plants trees, and support needed etc. In each household, one person (preferably the head of household or his legitimate representative) was targeted as the respondent. In each village we also made efforts to identify female headed households who were included in the survey.
- Vegetation data: The data sought here included the rate of woody biomass degradation, the potential for tree planting and restoration accompanied by possible strategies, the identification of areas where different EbA interventions could take place, etc. For detailed procedures for collecting this data, please see the Vegetation Inventory Protocol section.
- Farm Data: These data focused on the status of the exploitation, the location, the restoration or rehabilitation areas, the state of the woody plants, the ambitions in terms of tree planting, the questions of food security, production status, etc.
- Community forest level information. Data were collected using focus group with community forest leaders and community members including women. Separate focus groups were held with women to deepen understanding of women activities and their relationship with the forest. At least one mix sex focus group was organised in each community and one, women only focus group.
- Cooperatives. Information was also collected from at least one cooperative in each municipality. Data collected included the number of members, main income generating activities and sales and business partners.
- Key informant interviews were also carried out with government and municipality staffs especially those related to forestry, environment, and agriculture in order to appraise their perception of climate change and especially available tools and strategies that they use to implement EbA if ever in each of the municipalities. These persons were also contacted to provide additional information on agricultural productivity especially that farmers knowledge on yields were relatively weak.

3. INDICATOR ANALYSES AND M&E PLAN

3.0. Indicator analyses

The indicators were assessed based on the SMART criteria as shown in table 3.1 below. The indicators assessed were the final list of indicators provided by PABE for the project. When an indicator was found not to respect the SMART criteria, the indicator was rephrased accordingly. The list of indicators below is the revised list which includes the baseline situation.

Table 3.1: Summary of criteria used in assessing the indicators

Criteria	Description
Specific	- Is it clear what is being measured? - Has the appropriate level of disaggregation been specified? - Does the indicator capture the essence - of the desired result? - Is the indicator specific enough to measure progress towards the result? - Does it capture differences across areas and categories of people?
Measurable	- Are changes objectively verifiable? - Will the indicator show desirable change? - Is it a reliable and clear measure of results? - Is it sensitive to changes in policies and programs? - Do stakeholders agree on exactly what to measure? - Is the indicator practical to monitor?
Attainable	- What changes are anticipated as a result of the assistance? - Is/Are the result/s realistic?
Reliable	- Does the indicator capture the essence of the desired result? - Is it relevant to the intended outputs and outcome? - Is the indicator plausibly associated with the sphere of activity?
Trackable in time	- Are data available at a reasonable cost and effort? - Are data sources known? - Does an indicator monitoring plan exist?

Source: Adapted from Denz et al 2021.

GCF Impact Indicators:

A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions

Indicator	Definition of indicator	Target /assumption	State at baseline
A.1.2 Numbers of males and females benefiting from the adoption of diversified, climate resilient livelihood options	Total number of males and females who adopted diversified climate resilient livelihood options	11,000 women and 11,000 men benefit from climate resilient livelihoods	Few farmers are already involved in implementing some EbA options.details per option are reported in section 4.3.

Baseline survey results show that males and females in all the studied villages are already practicing some EbA options amongst which Agroforestry, conservation agriculture, soil and water conservation techniques, improved forage, integration of fruits trees into existing farming systems, etc (details about numbers are presented in table. They are also involved in diversified income generating activities

amongst which, NTFPs collection and processing, charcoal, and apiculture. Details about these various practices are reported in section 4.

Implication for PABE is that within the scope of the project, it will be important to assess how farmers improved on exiting practices and or how these technologies could be scaled out to meet project targets. Efforts should be made to target women as potential beneficiaries especially that the number of women involved in EbA practices are comparably lower.

A4.0 Improved resilience of ecosystems and ecosystem services

Description	Definition of indicator	Targets	State at baseline
A4.1. Coverage/scale of ecosystems protected and strengthened in response to climate variability and change	Level of degradation on at least 3600ha of land	3,600 ha of degraded forests protected and strengthened in response to climate variability and change.	zero

A summary of land cover in the area and state of degradation is presented in table 3.2

GCF outcome indicators

A7.0 Strengthened adaptive capacity and reduced exposure to climate risks

Description	Definition of indicator	Targets	State at baseline
Use by vulnerable communities, businesses, and public-sector services of Fund supported tools, instruments, strategies and activities to respond to climate change and variability.	Number and type of actors using different capacity development tools, instruments and strategies developed by the project: e.g training manuals, EBA technical bulletins	30% of 22,000 people in 7 communities, 30% of technical officers in the 7 Districts and 20% of technical officers in municipal and central government using Fund supported tools, instruments, strategies and activities to respond to climate change	**zero** No specific EbA tools, capacity instruments or strategies exist. Existing technical bulletins are outdated and do not consider climate change risks and vulnerability

Farmers and key informants interviewed during the baseline all confirm the communities are exposed to several climate risks and vulnerability. These include irregular rainfall, heavy rains over short periods of time, droughts, floods, difficulty to carry out off seasons farming.

Faced with these challenges extensions officers we talked to narrate that existing extensions materials and other technical bulletins meant for farmers are outdated and do not consider climate change related risks and vulnerability. Focus group discussions with farmers did not suggest the existence of any climate change adaptation support materials or tools. Household surveys suggest that about 8% of the respondents (55 in number) 68% (37 in number) of whom were females are aware of some policy or plan(s) at national and/or local level on ecosystem-based adaptation or have used natural resources to adapt to climate change e.g. tree planting. It is thus necessary to develop extension materials and strategies that response to climate risks and vulnerability.

Climate trends in PABE project areas

According to the country's climatic framework, Benin covers three climatic zones from south to north. This is from the Guinean zone to the Sudanian zone via the Sudano-Guinean zone in central Benin. Thus, the communes of intervention of the PABE are divided between the Sudano-Guinean zone and the Sudanian zone. The communes of Tchaourou, Djougou, Ouaké, Cobly, Boukoumbé and Banikoara are in the Sudanian zone while the commune of Dassa-Zoumè is in the Sudano-Guinean zone. The Sudanian zone in northern Benin (between 9° 45' – 12° 25'N) is characterized by a unimodal rainfall regime. The rainy season extends from April to October, with a peak between June and September. The vegetative growth period in this area is less than 145 days, coinciding with the rainy season. The average annual precipitation is less than 1000 mm and the average relative humidity is 54.9%. The average annual temperature is 27.5°C. The Sudano-Guinean zone in central Benin (between 7° 30' – 9° 45'N) is characterized by a unimodal rainfall regime peaking between May and October, with rainfall average annual 900–1100 mm. The vegetative growth period is about 200 days, during the rainy season. The average annual temperature varies between 21.2°C and 32.5°C and the relative humidity between 45.5% and 87.1%.).

a) <u>Sudanian Zone</u>

- ***Rainfall***

Figure 3.1 presents the interannual variability of rainfall in the Sudanian zone which covers the communes of Ouaké, Boukoumbé, Cobly, Djougou, Banikoara, Tchaourou and respectively the forests of Salangawa, Katenga, Didani, Bakou, Déroubou, Bétérou.

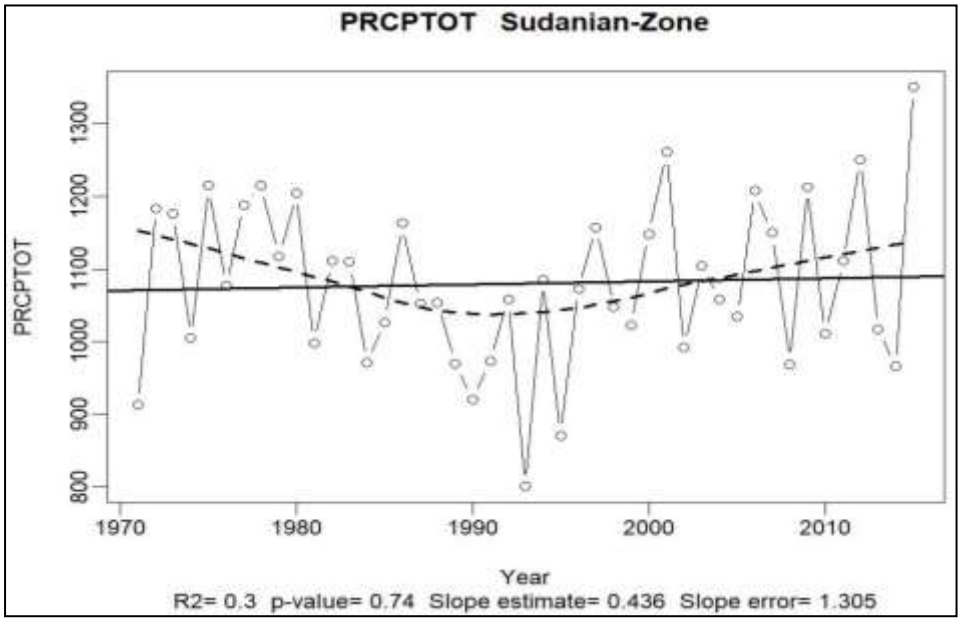


Figure 3.1: Trend of annual rainfall amounts in the Sudanian zone from 1971 to 2015

Data processing, DNM, 2015

The analysis of Figure 3.1 reveals an inter-annual variability in rainfall amounts over the period 1971 to 2015 with a general upward trend in the Sudanian zone. This upward trend is justified by the values of the slope of the regression line which is positive, i.e. 0.436. It should also be noted that this trend is not statistically significant because the value of the calculated p-value is greater than 0.05. However, this variability can have repercussions on forest ecosystems and agrosystems.

- ***Temperature***

Figure 3.2 illustrates the evolution of the annual average minimum and maximum temperature in the Sudanian zone from 1971 to 2015.

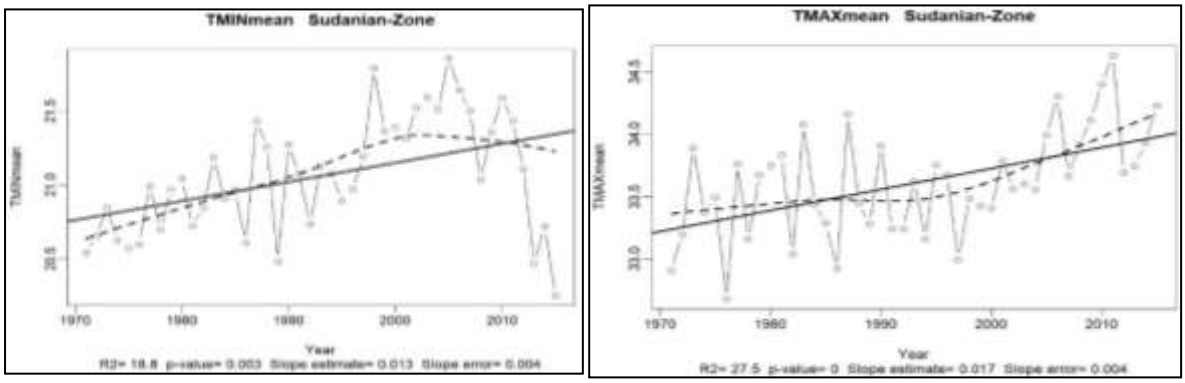


Figure 3.2: Evolution of the annual average minimum temperature in the Sudanian zone from 1971 to 2015. Data processing, DNM, 2015

It is observed a variability of the minimum and maximum average temperature in the municipality of Ouaké with a significant trend (p-value <0.05) upwards (slope greater than zero). This observation can be further amplified by the effects of deforestation with accentuation of evaporation and repercussions on water resources, forest ecosystems and agriculture.

b) <u>Sudano Guinean zone</u>

- ***Rainfall***

Figure 3.3 presents the interannual variability of rainfall in the Sudano-Guinean zone in Benin from 1971 to 2015. The Sudano-Guinean zone covers the commune of Dassa-Zoumè with Bétécoucou forest

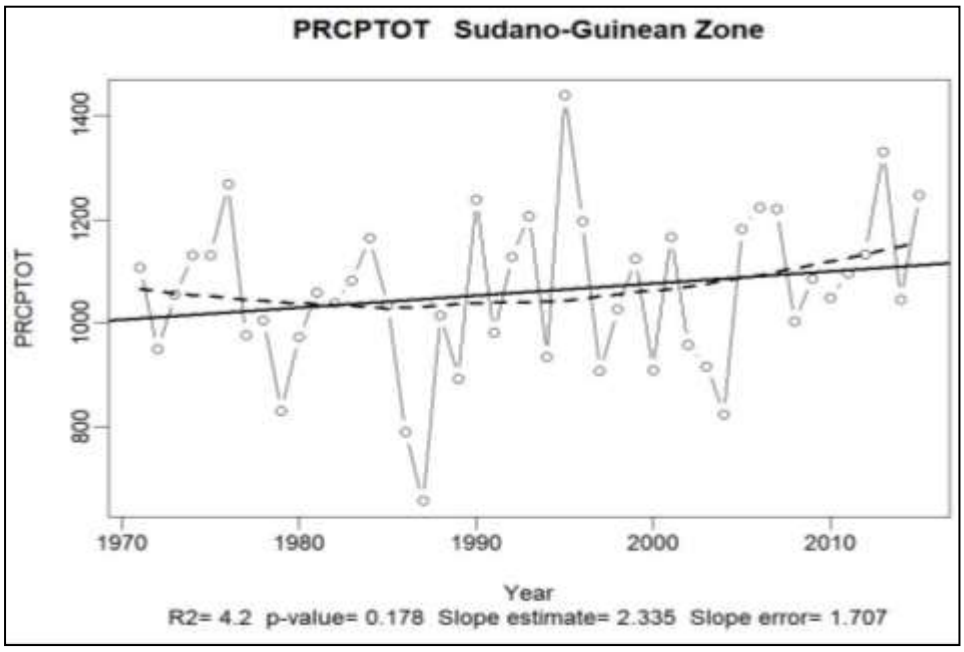


Figure 3.3: Trend of annual rainfall amounts in the Sudano-Guinean zone from 1971 to 2015

Field work and cartographic processing

Analysis of Figure 3 reveals an interannual variability in rainfall amounts over the period 1971 to 2015 with a general upward trend in the Sudano-Guinean zone.

- ***Temperature***

Figure 3.4 illustrates the evolution of the average annual maximum temperature in the municipality of Dassa-Zoumè in the Sudano-Guinean zone from 1971 to 2015

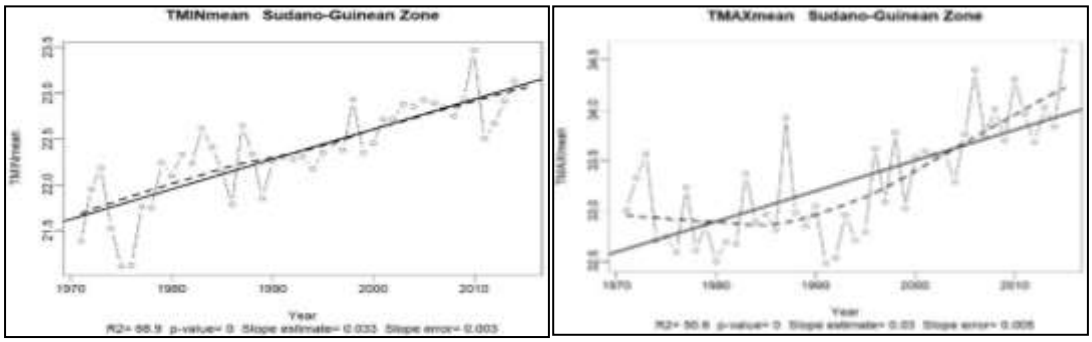


Figure 3.4: Evolution of the average annual temperature in the Sudano-Guinean zone from 1971 to 2015. Source: Field work and cartographic processing

The maximum temperatures also show variability with an increasing trend (positive slope) over the period. Statistically this trend is significant (p-value < 0.05). Thus, the increase in temperatures can accentuate the evaporation of water resources with repercussions on forest and agricultural ecosystems.

Other consequences of these variability include degradation of farm to market roads, difficulty to dry produce, difficulty to store products and challenges to meet supply orders.

Project outcomes

Outcome1: 3600 hectares of land restored for multi-use energy and livelihood benefits.

Description	Definition of indicator	Target	State at baseline
Number of ha of forest land restored.	The number and ha of land that will be restored/planted	3600ha of forest land restored	**Zero**
Number of ha of land restored in each community/project site land restored for multi-use energy and livelihood benefits	Minimum number of lands restored in each site for multipurpose use including energy, livelihoods benefits	Minimum 10ha of land restored in each site for multiple use including energy and livelihoods	**zero**
Number of orchards created	Minimum number of orchards created per site	210ha, 30ha per site	**zero**

A summary of land cover in the area and state of degradation is presented in table 3.2. Land cover and land use statistics indicate the state of degradation in each project site and thus possible to meet project target. Findings show that in the classified forest there are different land uses/cover which the project can build on for restoration e.g UA Bakou (58,276.51ha), UA Bétérou (26,982.15 ha).

Table 3.2: Land cover statistics in the 7 forests

Land use/land cover	Area (ha)	Percentage (%)
Bétécoucou	-	-
Farmland and fallow	170.12	28.22
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	220.75	36.62
Forest plantations / Fruit plantations	3.52	0.58
Tree and shrub savannas	204.69	33.95
Rocky surface	3.82	0.63
Total	**602.90**	**100.00**
Katenga	-	-
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	4.69	9.45
Tree and shrub savannas	29.42	59.31
Farmland and fallow	15.5	31.24
Total	**49.61**	**100.00**
Didani	-	-
Tree and shrub savannas	3.26	58.16
Farmland and fallow	2.34	41.84
Total	**5.60**	**100.00**
Salangawa	-	-
Farmland and fallow	8.44	29.10
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	17.76	61.2
Tree and shrub savannas	2.82	9.7
Total	**29.02**	**100.00**
Déroubou	-	-
Farmland and fallow	11.66	36.38
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	7.91	24.69
Tree and shrub savannas	12.47	38.93
Total	**32.04**	**100.00**
Bakou	-	-
Farmland and fallow	5837.48	10.02
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	31603.84	54.23
Water	87.33	0.15
Forest plantations / Fruit plantations	2637.79	4.53
Tree and shrub savannas	14284.46	24.51
Rocky surface	3825.61	6.56
Total	**58276.51**	**100.00**
Bétérou	-	-
Farmland and fallow	1954.99	7.24
Forests cover area (Open forests and wooded savannas, Gallery forests and riparian forests)	12825.31	47.53
Built up area	196.68	0.73

Land use/land cover	Area (ha)	Percentage (%)
Water	164.42	0.61
Forest plantations / Fruit plantations	894.82	3.32
Tree and shrub savannas	9500.87	35.21
Rocky surface	1445.07	5.36
Total	**26982.15**	**100.00**

Besides, farmers reported during focus group discussions and surveys that soil are generally degrading and gave several reasons to explain degradation as shown in (Table 3.3).

Baseline data show evidence of the use of EbA practices including agroforestry, FMNR, composting intercropping, crop rotation on individual farmlands (section 4 for details). Discussions with community forest leaders indicate that some portion of community managed forest also benefit from enrichment plantings, restoration of degraded areas and other sustainable management practices implemented by the forest management committee. These activities will need to be intensified during PABE project implementation.

Table 3.3: Percentage of farmers reporting different factors causing soil degradation

Soil degradation drivers	Control sites		Beneficiary sites		Male		Female	
Increase in salinity	10	7.6%	37	13.1%	42	13.0%	5	5.5%
Intensive land use	42	32.1%	107	37.7%	124	38.4%	25	27.2%
Bad farming practices	92	69.7%	187	66.1%	210	65.0%	69	75.0%
Minimal/insufficient application of fertilizer	17	13.0%	31	11.0%	34	10.5%	14	15.4%
Flood	21	16.0%	58	20.5%	71	22.0%	8	8.8%
Monoculture	52	39.7%	80	28.3%	104	32.2%	28	30.8%
Tree cutting	66	50.0%	147	51.9%	167	51.7%	46	50.0%
Extreme climatic events leading for example to floods and/or drought	33	25.2%	66	23.3%	74	22.9%	25	27.5%
Applying too much or the wrong type of fertilizer	54	41.2%	80	28.3%	102	31.6%	32	35.2%
Pests and diseases	6	4.6%	36	12.7%	35	10.8%	7	7.7%
Others	173	83.2%	379	82.6%	402	80.1%	150	90.9%

Output1.1. Seven forest management plans revised or developed and put into practice by Community Forest Management Committees, to include EbA and climate-resilient sustainable forest management practices.

Description	Definition of indicator	Targets	State at baseline
Number of forest management plans having EbA and climate resilient sustainable forest management practices	The Number of forest management plans revised and /or developed that include EbA and climate resilient sustainable forest management practices	7 CFMCs at Level 4: CFMC NR permit system working effectively to enforce sustainable natural resource extraction.	Zero No existing forest management plan has EbA options however some EbA activities were recorded in OSN protected forest

Review of existing forest management plans reveal that none of them has elements of EbA. However, focus group discussions show that some members of the Bakou and Bétérou forest management committee of Ouémé Supérieur and N'Dali (OSN) protected forest had carried out carried EbA related techniques specifically tree planting activities and enrichment planting in the last two years prior to data collection in different parts of the forest including degraded lands, and in farms and settlements. Different species planted include: *Tectona grandis; Gmelina arborea; Khaya senegalensis, etc.*

etc. (Table 3.3 and 3.4). According to community forests leaders, some of the planting materials came from nurseries run by the communities and others were supplied by government or NGOs. PABE can exploit this experience proposing other EbA options in the revised management plans.

Table 3.4: EbA activities carried out in some management units of OSN protected forests

	UA Bétérou			UA Bakou	
Activities carried out by AVIGEF	**Sinahou**	**Ouberou**	**Kpessou**	**Daring**	**Bakou**
Sustainable forest management					
Reduced impact logging	No	No	No	No	No
Sustainable harvest plans	No	No	No	No	No
Enrichment planting	Yes	Yes	Yes	Yes	Yes
Planting degraded forest areas or reforestation	Yes	Yes	Yes	Yes	Yes
Avoiding deforestation and forest degradation	Yes	Yes	Yes	Yes	Yes
Avoiding slash and burn	No	Yes	Yes	No	No
Reducing illegal logging	Yes	Yes	No	Yes	Yes
Assisted regeneration	Yes	Yes	Yes	Yes	Yes
Sustainable agricultural practices					
Agroforestry	Yes	Yes	Yes	Yes	Yes
Intensification and diversification	No	Yes	Yes	Yes	Yes
Conservation agriculture	No	No	No	No	No
Soil and water conservation	No	Yes	No	Yes	No
Biodiversity conservation					
Conservation of high value indigenous tree species	Yes	Yes	Yes	Yes	Yes
Wildlife conservation	No	No	No	Yes	No
Conserved areas for high biodiversity	No	No	No	Yes	No
Aquatic area conservation	No	Yes	No	Yes	No
Wetland management	No	No	No	No	No

Source: Focus group discussions

Table 3.5: Species of tree planted by UA Bakou and Bétérou

	Species of trees planted		
AVIGEF	**In Degraded areas**	**For Enrichment**	**In Farm and settlement areas**
Sinahou	- *Tectona grandis* - *Gmelina arborea* - *Khaya senegalensis*	- *Tectona grandis* - *Gmelina arborea* - *Khaya senegalensis*	
Oueberou	- *Anacardium occidentale* - *Gmelina arborea* - *Khaya senegalensis* - *Mangifera indica* - *Citrus sinensis*	- *Gmelina arborea* -	- *Anacardium occidentale* - *Gmelina arborea* - *Khaya senegalensis* - *Tectona grandis* - *Mangifera indica*
Kpessou	- *Gmelina arborea* - *Khaya senegalensis* - *Tectona grandis*	- *Gmelina arborea* - *Khaya senegalensis* - *Tectona grandis*	- *Anacardium occidentale* - *Mangifera indica* - *Citrus sinensis*

	- *Anacardium occidentale*	-	
Daringa	- *Gmelina arborea* - *Tectona grandis*	- *Gmelina arborea* - *Tectona grandis*	- *Anacardium occidentale* - *Mangifera indica* - *Gmelina arborea* - *Eucaleptus*
Bakou	- *Gmelina arborea* - *Khaya senegalensis* - *Tectona grandis*	- *Gmelina arborea* -	- *Mangifera indica* - *Moringa oleifera* - *Tectona grandis* - *Gmelina arborea* - *Citrus sinensis*

Source: village level focus group discussion

Output 1.2. Land reforested to buffer against the impacts of climate change such as floods and soil erosion, and to enhance the provision of non-timber forest products (NTFPs) such as fruits, medicines, nuts, fuelwood and fiber

Description	Definition of indicator	Target	State at baseline
Percentage survivorship of planted trees.	Number of trees planted and that survive	60% of trees planted survive	Zero

About 57% of both the control and beneficiary groups had planted at least one tree in the last year prior to data collection (table 3.6) while about 43 % had not planted any. More women than men had not planted any tree in both the control and beneficiary groups. In focus groups it was reported that transhumance and other stray animals reduce the survival rate of some of the trees planted. Most of the farmers had contributed to protecting at least one tree. There were no preferences as to which species of trees were planted for different purposes in degraded forests, agricultural lands, and for enrichment plantings. Some of the farmers are not properly informed about the environmental consequences of planting different tree species. For example, eucalyptus was reported to be planted on farmland when it has negative consequences on the environment. It is important to take into consideration farmers potential to plant trees based on available land and other resources. It is important to take note of the survival rate of trees in different farming systems to establish the number of trees to be planted to meet project targets. Focus group discussions reveal that 6 out of ten trees planted may survive and in some cases it may be lower especially due to the influence of stray animals and transhumance for the case of the trees planted within the forests.

Table 3.6: Number of trees planted by individual households in the last 12 months

	None	Less than 10	11 to 50	51 to 100	More than 100
Control	95	57	19	21	16
	45.7%	27.4%	9.1%	10.1%	7.7%
Beneficiary	190	137	56	47	29
	41.4%	29.8%	12.2%	10.2%	6.3%
Male	193	152	65	55	37
	38.4%	30.3%	12.9%	11.0%	7.4%
Female	92	42	10	13	8
	55.8%	25.5%	6.1%	7.9%	4.8%
Total	285	194	75	68	45
	42.7%	29.1%	11.2%	10.2%	6.7%

Source survey data

Table 3.7: Number of trees planted 2021 in protected forests in the last 12 months

	UA Bétérou			UA Bakou	
Activities carried out by AVIGEF	**Sinahou**	**Ouberou**	**Kpessou**	**Daring**	**Bakou**
Tree planting activities					
Number of trees planted enrichment plating	166,000	10,000	30000	~ 3000	/
Area planted to enrichment planting (ha)	1000	100	30	>100	52
Number of trees planted in degraded forest	/	/	/	/	/
Area planted degraded forest	500	/	/	/	300
Tree planted in agroforestry system	/	100	1200	50,000	30,000
Area planted agroforestry systems(ha)	20	20	/	/	/

Outcome 2. Higher productivity from agricultural livelihoods secured in the face of climate change

Description	Definition of indicator	Targets	State at baseline
- **Increased average yields of major crops per ha.** - **Increased revenue from marketing and processing** - **Increased nutrition and food security**	The increase in yields, per ha of different crops including revenue	Yields of 50% of 22 000 beneficiaries increase by 20%.	Survey results based on 2012 data for maize and sorghum are for example 1.5tons/ha and 0.6 tons/ha Households may sell 0-100% percent of produce About 30-50 of households have food insecurity issues for up to 3 months of a year

This baseline captures current average production for 2021, and average farm sizes for the same year for major crops grown by the respondents. Due to poor record keeping habits of farmers we found great variability and inconsistencies in the data reported by farmers. For example, current yields for maize, sorghum and soja based on survey data stand at 1.5tons/ha ,0.6tons/ha and 0.8 tons /ha respectively. While the yield for maize is closer to the averages of the municipality recorded in 2020 by the bureau of agricultural statistics, they were all very low for sorghum and soja. For this reason, we make reference to yields for major crops as provide by the department of agricultural statistic reported in the annex.

Survey results also show different sources of revenue amongst which livestock, agriculture and other sources. Generally, most household sell between 0% to 100% percent of their harvest depending on the product. For major staple such as maize and yams, farmers sell between 40% to 50 % of their harvest respectively. For crops like groundnuts, soja, and sorghum, baseline result show that they respectively sell 90%, 80% and 70% of their harvest. Processing is not common in all the villages. Only a few households are into artisanal processing of NTFPs e.g Nere and shea.

Baseline data indicate that most household have access to food for 7 months of the year during which time they depend on their harvest or could buy. The most difficult months of the year when there is usually shortage of food are June -August. Only very few communities depend on wild forest products to cope during the difficult periods. Depending on the community and customs, some households may be over dependent on cereals or tubers especially during the harvesting seasons.

Output 2.1. Climate resilient agriculture interventions, which increase agricultural yields under climate change conditions, implemented on 3000 hectares

Description of indicator	Definition of indicator	Targets	State at baseline
Area (ha) of agricultural lands where sustainable, climate-resilient agriculture is implemented	The total areas in ha of farmland where climate smart agriculture technologies have been implemented	3,000 ha of agricultural lands where climate-resilient agriculture is implemented. 1000 ha of climate resilient agriculture or climate smart agriculture (CSA) will be implemented within the community forest while 2000 ha will be under climate smart agriculture (CSA) outside the forest	Zero. However, baseline show evidence of the use of EbA practices on individual farmlands, including agroforestry, FMNR, soil and water conservation.

Baseline information show evidence of Ecosystem based adaptation practices in the studied communities. For example, majority of respondents practice mulching, crop diversification/intercropping, rainwater harvesting, terracing, contour ploughing use of drought resistant crops, zero tillage; Average farm sizes range from 0.2-7.5ha depending on the crop. Other activities include planting of fruit trees amongst which cashew, Baobab, mangoes. Even though EbA practices are mentioned, they are only implemented by a small proportion of the communities. Other EbA practices are also carried out in forest lands such as enrichment planting and sustainable management of natural space.

The baseline study shows evidence of ecosystem-based adaptation practices in the studied municipalities. Knowledge varied with respect to the of adaptation practice. Crop rotation and the use of chemical fertilisers were the most reported with at least 50% of both males and females of the beneficiary and control groups each reporting the use of the two technologies. Rainwater harvesting, mulching and composting were the other most cited soil and water conservation practices, they were cited by at least 24% of the respondents (Table 3.8). The least cited was zaï. Additional information about the respondents segregated by communes, gender and beneficiary vs control groups are reported in section 4 and the annexes.

Table 3.8: Percentage of farmers performing EbA practices: Soil and water conservation

Sex	Crop rotation	Rainwater harvesting	Stone breaks	Mineral fertiliser	Mulching	Terracing	Composting/ vegetation	Alley cropping	Zaï	cover crop	Irrigation	other
Male	71	26	19	57	25	16	35	19	12	15	20	17	11
Female	61	30	21	59	25	16	42	13	9	15	19	16	8.5
Control	67	25	19	57	27	16	35	14	11	15	19	17	10
Beneficiary	69	28	19	57	24	16	37	19	11	15	19	17	10
Total	69	27	19	57	25	16	36	18	11	15	19	17	10

Output 2.2. Market access created for climate resilient crop to support EbA.

Description of indicator	Definition of indicator	Targets	State at baseline
The economic value of trade agreements (number and value of trade agreements) facilitating sales from the value chain, which post-harvest facilities are expected to increase/improve.	Total income generated from the NFTP marketed Total number of new tree-based income source	7-14 new trade agreements,1 per cooperative (formal /informal or hybrids of the latter 2). Economic value created by the project to be established during baseline assessment in year 1.	2 out of 14 cooperatives have some kind of trade agreements Income is generated from the sales of 0 to about 25000kg of different produce

Discussions with the leaders of the case study cooperatives indicate that only 2 out of 14 case study cooperatives have any form of commercial contract with buyers. Some of cooperatives have informal contracts with buyers for example the group Suru tcheka in Djougou sells Nere to buyers from Niger through informal agreements based on trust. It will be important to see how many new agreements will be engaged by these cooperatives and how the value of the agreements evolve with time. Baseline data indicate that some of the coops generated some income in the past year while others did not generate any.

Table 3.9: Cooperatives membership and activities

N°	Communes	Name of cooperative	Activity	Number of members			Number of direct beneficiaries			Total annual production			COMMERCIALISATION		OBSERVATION
				M	F	TOTAL	M	F	TOTAL	Before PABE	With PABE AU 30/08/22	Projection with PABE on31/12/2022	Based on demand Yes /No	Have a contract	
1	Djougou	Sessewa Tchenime	Anacarde	2	09	11	28	44	72	1500 Kg	3500 Kg	5000 Kg	Yes	Yes	Well-functioning cooperative
		Suru-Tcheka	Nere	0	18	18	0	18	18	9360 Kg	24960 kg	62400 kg	Yes	No	Very well organized cooperative, but registration in progress.
2	Ouaké	coopérative des producteurs et transformateurs des noix cajou Alayomdé	Anacarde	20	14	34	20	14	34	0	0	1000kg	No	No	Cashew producer cooperative initiated into training by PABE
		coopérative des producteurs et transformateurs des noix cajou Yamasalé	Anacarde	10	25	35	0	0	0	0	0	1000kg	No	No	Cashew producer cooperative initiated into training by PABE
3	Banikoara	Déroubou	Karité	5	45	50	0	0	0	0	0	1000kg	No	No	Cooperative in the process of being formalized following PABE training
		Nikkido	Karité	3	30	33	3	30	33	416 litres	1560 litres	5200 litres	Yes	No	Well organized cooperative
4	Boukoumbé	SCOOPS beurre de karité de Koudogou	Karite	0	28	28	0	28	28	600 litres	2500 litres	10000 litres	Yes	No	Well organized cooperative
		SCOOPS graine de Néré de Koukoua	Nere	3	13	15	12	46	58	2500 Kg	3000 Kg	5000 Kg	Yes	No	Cooperative with poor market access
5	Cobly	Piritagou (Nouagou)	Karite	5	20	35	15	44	59	800 litres	2000 litres	5000 litres	Yes	No	Well organized cooperative

N°	Communes	Name of cooperative	Activity	Number of members			Number of direct beneficiaries			Total annual production			COMMERCIALISATION		OBSERVATION
				M	F	TOTAL	M	F	TOTAL	Before PABE	With PABE AU 30/08/22	Projection with PABE on31/12/2022	Based on demand Yes /No	Have a contract	
		Bagapodi	Karite	4	32	36	4	32	36	500 litres	2000 litres	10000 litres	Yes	No	Well organized cooperative
6	Dassa-Zoumè	Agbara	Amandes de cajou	3	08	11	20	13	43	15000 Kg	20000 Kg	25000Kg	Yes	Yes	Well organized cooperative
		Egbelayo	Amandes de cajou	0	26	26	0	26	26	500 kg	2500 kg	10000 kg	Yes	No	Without electricity, unsuitable processing equiqepment
7	Tchaourou	Union communale des producteurs d'anacarde (UCPA) de tchaourou: sous coopérative de Tchalla	Anacarde	15	33	48	10	22	32	0	500 Kg	2000 Kg	Yes	No	Cashew producer cooperative initiated into training by PABE
		Coopérative villageoise de producteurs d'anacarde (CVPA) de Banigri	Anacarde	12	18	30	12	18	30	0	0	2000 Kg	No	No	Cashew producer cooperative initiated into training by PABE
				0	26.00	11.00			0						

Outcome 3. Strengthened technical and institutional capacity of the government and communities for implementing EbA and climate resilient agriculture and enhanced awareness of the adaptation benefits

Description of indicator	Definition of indicator	Target	State at baseline
Increased /awareness and uptake of EbA and climate resilient agriculture approaches by government in revised forest and agricultural policies. and communities (see project doc pg 20)	The number and type of Government and community services that implement EbA practices or who report strengthened capacity to implement EbA	30% of 22,000 people in 7 communities, 30% of technical officers in the 7 Districts and 20% of technical officers in municipal and central government using Fund-supported tools, instruments, strategies and activities to respond to climate change, segregated by gender.	**Zero**

Discussions with key government officials of different ministerial departments and at the different municipalities including agriculture, forestry and other environmental services suggest that these staffs are not abreast with EbA practices. One in 4 staffs interviewed may be using them without knowing they are EbA. In general, the whole concept of climate change is not new to staffs at the forest, agriculture and municipality services. Some of the staffs had received some training on climate change in school without any focus on EbA. The staff belief the concept of EbA is new and much information exists at the central services, but this does not reach the communes. None of the forest management plans had any EbA options.

Household interviews show that about 5.6 % of all the respondents were either aware of a policy or plan(s) at national and/or local level on ecosystem-based adaptation. Women both in the control and beneficiary group combined (8.5%) claimed to be aware of such policies than the men in both groups combined (4.5%).

Output 3.1. Tools, instruments, and strategies developed by EbA to enable communities, businesses and the public sector to respond to climate change and variability.

Description	Definition of indicator	Target	State at baseline
Typology of tools, instruments and strategies developed by EbA to enhance communities' businesses and the public sector to respond to climate change	The number and kinds of tools, instruments, and strategies developed to enhance - Communities - Public sector - Businesses Respond to climate change		**Zero**

Discussion with community leaders including forest management committee, cooperatives leaders and public sector actors reveals that they are not aware of any tools or EbA strategies that may enhance their knowledge on EbA.

Output 3.2. Communities, businesses and the public sector representatives trained to use EbA tools and strategies developed to respond to climate change and variability.

Description	Definition of indicator	Target	State at baseline
Number and type of people trained to use EbA tools and strategies developed to respond to climate change and variability.	The number of - Community - Public sector - Private sector representatives trained to use various tools and strategies developed		Zero. Only very few people trained on EbA practices. More training is required at households, community and municipal levels.

Baseline information revealed very limited EbA related trainings in the studied villages (8%) of respondents. Neither did the key informants had attended any such trainings. In Djougou municipality for example the agricultural officer claimed he had been trained on adaptation practices and he had also trained some members (number not available) of his community on the techniques.

3.1. Monitoring and evaluation plan

Annex 1 describes the proposed monitoring and evaluation plan. It is designed to capture the total amount of change that has taken place and that can be claimed by PABE interventions. In order to meet this, requirement and as described in the methodology section we used the LORTA approach that permits us to compare the results of the intervention to a control group and site that did not receive the interventions of PABE. In this regard the control groups were selected to be as similar as possible to the beneficiary communities. To be effective we used a quasi-experimental design approach to choose communities within the same municipality that had a community forest but were not part of PABE. The communities were close to one another and carried out similar activities to that of the beneficiary group. Baseline data was collected for both the beneficiary and control community and similarly monitoring data will be collected from the same. The quasi-experimental approach uses statistical techniques that aim to mimic random assignment.

In the case of the PABE project, the quasi-experimental design was used because it was not possible to randomize the classified forests and the communities surrounding the forests and the members of the community to treatment and control groups. In other words, the choice of the community forests and the concerned villages where PABE is implemented is guided by project objectives.

Monitoring data will therefore be collected from:

a. Forests: (i) two classified forests and (ii) five community forests (beneficiary forest)
b. Beneficiary households and cooperatives in selected villages living in and around the two types of forests
c. Households and cooperatives in control villages

To address ethical issues, related to collecting data from the control community when they are not part of the project, we envisage that the control community benefit from subsequent project activities especially if there are avenues for scaling up.

The proposed M&E plan describe the following

- the indicators and data collection methods chosen,
- authority responsible for data collection
- a timetable for monitoring activities and components
- reporting requirements for the donor and project
- a budget for M&E

4. Detailed household level assessment

This section of the report presents detailed information on socio economic characteristics of the respondents, perception of climate change, adaptation practices, and types of trainings received. The data provide details on the baseline indicators and additional information that may be used to explain the current context. The data reported in this section are either segregated by gender, municipality and typology of respondents (control vs beneficiary). To facilitate comprehension of the tables, some details per municipality have been moved to the appendix.

4.1. Socioeconomic characteristics of the respondents

4.1.1. Number and sex of respondents per commune

A total of 666 respondents from 7 communes took part in the survey 25% of whom were females. The number of females however vary from one municipality to another from a low of 5% to a high of 44%. Low participation of women in some communities is largely due to religion and cultural differences that prevented some women from participating in the survey. In most cases women shied away from participating in the interviews. Some of the women were household heads or simply represented their husbands at the time of interview.

Table 4.1: Number and percentages of respondents per municipality.

	Control			Beneficiary			Control and beneficiaries combined		
Municipality	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Banikoara	26 (81)	6 (19)	32(100)	47(80)	12(20)	59(100)	73(80)	18(20)	91(100)
Boukoumbé	10 (30)	23 (70)	33(100)	46(73)	17(27)	63(100)	56(58)	40(42)	96(100)
Cobly	18 (63)	8 (31)	26(100)	41(63)	24(37)	65(100)	59(65)	32(35)	91(100)
Dassa-Zoumè	10 (30)	23 (70)	33(100)	45(69)	20(31)	65(100)	55(56)	46(44)	98(100)
Djougou	23(100)	0	23(100)	62(94)	20(31)	65(100)	85(95)	4(5)	89(100)
Ouaké	24(73)	9(27)	33(100)	67(96)	3(4)	70(100)	91(88)	12(12)	103(100)
Tchaourou	23(79)	6(21)	29(100)	59(86)	10(15)	69(100)	82(84)	16(16)	98(100)
Total	134(64)	75(36)	209(100)	367(80)	90(20)	457(100)	501(75)	165(25)	666(100)

Source: survey data. N/B percentages are in parenthesis

4.1.2. Average number of years respondents have been living in village

On average respondents have been living in the village for about 34 years +/-17 years. There seem to be no significant difference between the number of years for women and men respondents (Table 4.2). This means that the respondents have enough experience in their village to be able to explain climate related changes for at least the last three decades including impacts of climate change on their livelihoods and on the ecosystems.

Table 4.2: Average number of years respondents have been living in the community

	Control			Beneficiaries			Control and beneficiaries combined		
Commune	Male	Female	Total	Male	Female	Total	Male	Female	Total
Banikoara	43.1 (19.0)	52 (26)	44 (20.4)	46.1 (12.4)	52.1 (10.8)	44.9 (12.6)	35.4 (16.)	33.0 (22.0)	34.3 17.3)
Boukoumbé	23.9(19.0)	29.8 (13.6)	28.0 (15.4)	23.9 (16.3)	29.8 (18.0)	28.1 (16.6)	35.4 (17.5)	33.0 (15.8)	34.3 (16.8)
Cobly	41.0 (20.7)	33.7 (20.3)	38.8 (20.4)	41.1 (21.9)	33.7 (22.7	38.8 (22.1)	41.3 (21.4)	41.1 (22.3)	41.2 (21.6)
Dassa-Zoumè	49.9 (25.4)	41.1 (18.8)	43.7 (21.0)	44.2 (18.6)	34.9 (14.5)	41.3 (17.9)	45.2 (19.9)	38.2 (17.1)	42.1 (18.9)
Djougou	28.6 (6.6)	/	28.6 (6.6)	34.0 (14.9)	30.7 (9.2)	33.8 (14.6)	32.5 (13.3)	30.7 (9.2)	32.5 (13.2)
Ouaké	29.1 (19.2)	32.8 (18.7)	29.9 (18.2)	39.2 (14.0)	23.5 (23.3)	38.7 (14.3)	36.8 (15.9)	30.5 (16.5)	36.3 (15.9)
Tchaourou	27.3 (13.1)	17.8 (9.3)	25.3 (12.9)	28.1 (16.8)	24.4 (20.1)	27.5 (17.2)	27.9 (15.8)	21.9 (16.7)	26.9 (16.1)
Total	34.3 (18.9)	34.9 (18.7)	34.5 (18.8)	26.2 (17.1)	34.2 (19.1)	35.8 (17.5)	35.7 (17.6)	34.6 (18.8)	35.4 (17.9)

Source: Survey data. N = 659, Standard deviation in parenthesis

4.1.3. Educational level of respondents

Survey results indicate that most of the respondents (79%) had attended at least primary school. A comparatively higher proportion of men (21.5%) compared to women (18.8%) had not received any education. Survey results also show differences in educational levels between the municipalities with Banikoara having the highest number of respondents who had not been to school (Table 4.3)

Table 4.3: Education level of respondents per commune in number and percentage

Commune	Sex	No education	Primary	secondary	post-secondary	Total
BANIKOARA	Male	26 (36.0)	7 (10.0)	31 (42.0)	9 (12.0)	73 (100.0)
	Female	4 (22.0)	3 (17.0)	11 (61.0)	0 (0.0)	18 (100.0)
	Total	30 (33.0)	10 (11.0)	42 (46.2)	9 (9.9)	91 (100.0)
BOUKOUMBE	Male	17 (30.4)	16 (28.6)	19 (33.9)	4 (7.1)	56 (100.0)
	Female	10 (25.0)	13 (32.5)	15 (37.5)	2 (5.0)	40 (100.0)
	Total	27 (28.1)	29 (30.2)	34 (35.4)	6 (6.3)	96 (100.0)
COBLY	Male	3 (5.1)	5 (8.5)	34 (57.6)	17 (28.8)	36% 36%
	Female	2 (6.3)	6 (18.8)	18 (56.3)	6 (18.8)	32 (100.0)
	Total	5 5.5%	11 12.1%	52 57.1%	23 25.3%	91 (100.0)
DASSA ZOUMÈ	Male	13 (23.6)	14 (25.5)	21 (38.2)	7 (12.7)	55 (100.0)
	Female	8 (18.6)	11 (25.6)	19 (44.2)	5 (11.6)	43 (100.0)
	Total	21 (21.4)	25 (25.5)	40 (40.8)	12 (12.2)	98 (100.0)
DJOUGOU	Male	22 (25.9)	27 (31.8)	29 (34.1)	7 (8.2)	85 (100.0)

Commune	Sex	No education	Primary	secondary	post-secondary	Total
	Female	2 (50.0)	1 (25.0)	1 (25.0)	0 (0.0)	4 (100.0)
	Total	24 (27.0)	28 (31.5)	30 (33.7)	7 (7.9)	89 (100.0)
OUAKE	Male	5 (6.5)	22 (23.9)	52 (56.5)	12 (13.0)	91 (100.0)
	Female	1 (8.3)	1 (8.3)	9 (75.0)	1 (8.3)	12 (100.0)
	Total	6 (6.7)	23 (22.1)	61 (58.7)	13 (12.5)	103 (100.0)
TCHAOUROU	Male	21 (25.6)	18 (22.0)	36 (43.9)	7 (8.5)	82 (100.0)
	Female	4 (25.0)	8 (50.0)	3 (18.8)	1 (6.3)	16 (100.0)
	Total	25.00 (25.50)	26.00 (26.50)	39.00 (39.80)	8.00 (8.20)	98.00 (100)
Total	Male	108 (21.5)	109 (21.7)	222 (44.2)	63 (12.5)	502 (100.0)
	Female	31 (18.8)	43 (26.1)	76 (46.1)	15 (9.1)	165 (100.0)
	Total	138 (20.8)	152 (22.8)	298 (44.7)	78 (11.7)	666 (100.0)

Source: survey data

Table 4.4: Education level of respondents segregated by gender and control vs Beneficiary groups in number and percentage

	Sex	No education	Primary	Secondary	Post-secondary	Total
Control	Male	34	20	58	22	134
		(25.4)	(14.9)	(43.3)	(16.4)	100.0
	Female	12	17	38	8	75
		(16.0)	(22.7)	(50.7)	()10.7	(100.0)
	Total	46	37	96	30	209
		(22.0)	(17.7)	(45.9)	(14.4)	100.0
Beneficiary	Male	73	89	164	41	363
		(20.1)	(24.2)	(44.6)	(11.1)	(100.0)
	Female	19	26	38	7	90
		(21.1)	(28.9)	(42.2)	()7.8	(100.0)
	Total	93	115	202	48	458
		(20.3)	(25.1)	(44.1)	(10.5)	(100.0)
Total	Male	108	109	222	63	502
		(21.5)	(21.7)	(44.2)	(12.5)	(100.0)
	Female	31	43	76	15	165
		(18.8)	(26.1)	(46.1)	(9.1)	(100.0)
	Total	138	152	298	78	666
		(20.8)	(22.8)	(44.7)	(11.7)	(100.0)

Source: Survey data. N/B percentages are in parenthesis

4.1.4. Household size

Survey results found that the average household sizes for both control and beneficiary villages was 9 members (+/-6 members). Beneficiary households had relatively higher average household sizes (10 members) compared to control households (Table 4.5).

Table 4.5: Average household sizes for sampled respondents

Commune		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
		Control		Beneficiary		Total	
BANIKOARA	Male	7.8	2.7	10.9	8.0	9.8	6.7
	Female	10.0	4.4	10.7	6.1	10.4	5.5
	Total	8.2	3.1	10.9	7.6	9.9	6.5
BOUKOUMBE	Male	5.6	2.2	7.8	4.9	7.4	4.6
	Female	8.7	3.5	7.2	2.8	8.1	3.3
	Total	7.8	3.4	7.6	4.4	7.7	4.1
COBLY	Male	8.9	5.6	8.2	3.3	8.4	4.1
	Female	7.1	2.1	6.7	2.8	6.8	2.6
	Total	8.3	4.8	7.7	3.2	7.9	3.7
DASSA ZOUMÈ	Male	8.1	6.7	12.6	8.3	11.8	8.2
	Female	6.8	3.4	9.0	4.0	7.8	3.8
	Total	7.2	4.6	11.5	7.5	10.0	6.9
DJOUGOU	Male	7.8	5.3	11.0	6.1	10.2	6.0
	Female	0.0	0.0	5.3	2.2	5.3	2.2
	Total	7.8	5.3	10.7	6.0	9.9	6.0
OUAKE	Male	8.1	5.2	10.6	6.1	10.0	5.9
	Female	8.7	4.7	12.3	5.1	9.6	4.8
	Total	8.2	5.0	10.7	6.0	9.9	5.8
TCHAOUROU	Male	10.0	9.6	8.9	6.1	9.2	7.2
	Female	6.3	1.9	6.8	3.5	6.6	2.9
	Total	9.3	8.7	8.6	5.8	8.8	6.8
Total	Male	8.2	5.9	10.1	6.4	9.6	6.3
	Female	7.9	3.5	7.9	4.0	7.9	3.8
	Total	8.1	5.2	9.7	6.1	9.2	5.9

Source: survey data

4.1.5. Land holdings in ha mode of accessing land and state of farmlands

For all categories of respondents combined, total average land holdings range from a low of 6.6 ha to a high of 10.7ha. Men generally had bigger land sizes (10.8ha) compared to women (5.4ha). Further analysis shows that some respondents from Ouaké, recorded the smallest land holdings compared to the other commune for example Dassa-Zoumè 11.7ha. (Table 4.6). The amount and size of land matter because it may determine the kind of EbA practices that a given household may adopt.

Table 4.6: Total land holdings held by respondents segregated by commune and by sex.

		Control			Beneficiary			Total		
Communes		Mean	Std. Deviation	Median	Mean	Std. Deviation	Median	Mean	Std. Deviation	Median
BANIKOARA	Male	5.8	5.2	3.5	15.2	23.2	10.0	11.8	19.4	7.0
	Female	3.9	2.6	4.0	11.6	7.4	13.1	9.0	7.1	6.5
	Total	5.4	4.8	3.5	14.5	21.0	10.0	11.3	17.6	7.0
BOUKOUMBE	Male	2.5	1.2	2.5	11.4	30.2	4.0	9.8	27.6	3.0
	Female	2.8	2.4	2.0	3.3	2.4	3.0	3.0	2.4	3.0
	Total	2.7	2.1	2.0	9.2	26.0	3.0	7.0	21.3	3.0
COBLY	Male	5.3	3.3	5.0	9.5	18.1	6.5	8.2	15.2	6.0
	Female	2.7	1.6	2.5	5.9	3.8	4.8	5.1	3.7	4.0
	Total	4.5	3.1	3.5	8.2	14.6	6.0	7.1	12.5	5.0
DASSA ZOUMÈ	Male	6.9	7.1	3.5	18.4	24.4	11.0	16.3	22.7	10.0
	Female	4.9	5.7	4.0	7.0	3.5	6.5	5.9	4.9	5.0
	Total	5.5	6.1	4.0	14.9	21.0	8.0	11.7	18.0	6.0
DJOUGOU	Male	14.3	10.7	10.0	13.2	20.4	6.0	13.5	18.3	7.0
	Total	14.3	10.7	10.0	6.9	8.8	3.0	6.9	8.8	3.0
OUAKE	Male	5.4	6.6	3.0	5.5	3.2	5.0	5.5	4.3	5.0
	Female	3.6	4.5	2.0	4.3	2.5	4.0	3.8	4.0	2.0
	Total	4.9	6.1	2.5	5.5	3.2	5.0	5.3	4.3	5.0
TCHAOUROU	Male	12.6	21.0	7.0	11.2	12.1	8.0	11.6	15.0	7.0
	Female	4.7	2.9	3.0	8.6	6.9	7.5	7.1	5.9	5.0
	Total	11.0	19.0	6.0	10.8	11.5	8.0	10.9	14.0	7.0
Total	Male	8.1	11.2	5.0	11.7	19.9	6.0	10.8	18.1	6.0
	Female	3.7	3.9	3.0	6.7	5.3	5.0	5.4	4.9	4.0
	Total	6.6	9.5	4.0	10.7	18.1	6.0	9.4	16.0	5.0

Source: Survey data

Survey results show that respondents farmlands could be either inside or outside the forest. Most of the respondents had land outside or around the forest while 11% had farmlands inside the forest. More farmers in Tchaourou (26.8%) and Djougou (47.7%) had farmlands inside the classified forest compared to their peers from the other communes who do not own farms within the community forests. This maybe because farmers in these two communities are allowed to farm a limited portion of land within the classified forest against a fee. More men (28%) compared to women (20%) had farmland inside the forest (Table 4.7).

Table 4.7: Number and percentage of farmers having farmland inside and outside the forest segregated by municipality

	Control			Beneficiary			Total (beneficiary + Control)		
	Inside the forest	Around the forest	Total	Inside the forest	Around the forest	Total	Inside the forest	Around the forest	Total
BANIKOARA	0	28	28	0	57	57	0	85	85
	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%
BOU-KOUMBE	0	24	24	0	57	57	0	81	81
	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%
COBLY	0	25	25	2	57	59	2	82	84
	0.0%	100.0%	100.0%	3.4%	96.6%	100.0%	2.4%	97.6%	100.0%
DASSA ZOUMÈ	0	33	33	1	61	62	1	94	95
	0.0%	100.0%	100.0%	1.6%	98.4%	100.0%	1.1%	98.9%	100.0%
DJOUGOU	9	14	23	33	32	65	42	46	88
	39.1%	60.9%	100.0%	50.8%	49.2%	100.0%	47.7%	52.3%	100.0%
OUAKE	0	19	19	1	67	68	1	86	87
	0.0%	100.0%	100.0%	1.5%	98.5%	100.0%	1.1%	98.9%	100.0%
TCHAOUROU	0	28	28	26	43	69	26	71	97
	0.0%	100.0%	100.0%	37.7%	62.3%	100.0%	26.8%	73.2%	100.0%
	9	171	180	63	374	437	72	545	617
	5.0%	95.0%	100.0%	14.4%	85.6%	100.0%	11.7%	88.3%	100.0%

Table 4.8: Number and percentages of farmers having land inside and outside the forest segregated by commune and gender

	Males			Females			Total		
	Inside the forest	Outside the forest	Total	inside the forest	outside the forest	Total	inside the forest	outside the forest	Total
BANIKOARA	0	69	69	0	16	16	0	85	85
	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%
BOU-KOUMBE	0	47	47	0	34	34	0	81	81
	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%
COBLY	0	54	54	2	28	30	2	82	84
	0.0%	100.0%	100.0%	6.7%	93.3%	100.0%	2.4%	97.6%	100.0%
DASSA ZOUMÈ	0	53	53	1	41	42	1	94	95
	0.0%	100.0%	100.0%	2.4%	97.6%	100.0%	1.1%	98.9%	100.0%

	Males			Females			Total		
DJOUGOU	42	43	85	0	3	3	42	46	88
	49.4%	50.6%	100.0%	0.0%	100.0%	100.0%	47.7%	52.3%	100.0%
OUAKE	1	81	82	0	5	5	1	86	87
	1.2%	98.8%	100.0%	0.0%	100.0%	100.0%	1.1%	98.9%	100.0%
TCHAOUROU	23	59	82	3	12	15	26	71	97
	28.0%	72.0%	100.0%	20.0%	80.0%	100.0%	26.8%	73.2%	100.0%
Total	66	406	472	6	139	145	72	545	617
	14.0%	86.0%	100.0%	4.1%	95.9%	100.0%	11.7%	88.3%	100.0%

No matter the sex, commune or typology of respondents, the most common mode of acquiring land was by inheritance (Figure 4.1). In the commune of Tchaourou and Djougou where respondents could farm inside the classified forest, the most common mode of acquiring such land was by inheritance (54%). However, a good number (31%) could access the land by just clearing the forest since it was considered community/communal land (Table 4.9). More men (55%) compared to women 38% had tree crop plantations. Only a very small proportion of both sexes 6% use part of their land as pasture (Figure 4.2).

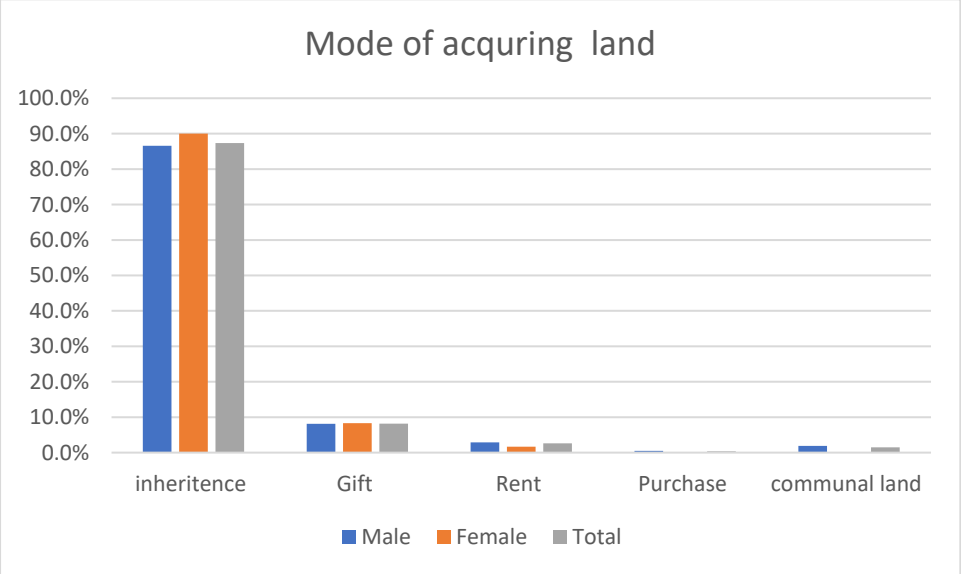


Figure 4.1: Percentage of respondents acquiring land through various means

Table 4.9: Number and percentage of farmers reporting mode of accessing land inside the forest segregated by sex and by commune

Sex	Commune	inheritance	Gift	Rent	Pur-chase	commu-nal land	Total
Male	DJOUGOU	36	2	1	0	16	55
		65.5%	3.6%	1.8%	0.0%	29.1%	100.0%
	TCHAOUROU	14	1	6	0	17	38
		36.8%	2.6%	15.8%	0.0%	44.7%	100.0%
	Total	15.4%			0.0%	0.0%	15.4%

Female	DJOUGOU	1			0	0	1
		100.0%			0.0%	0.0%	100.0%
	TCHAOUROU	4			0	3	7
		57.1%			0.0%	42.9%	100.0%
	Total	9			1	3	13
		69.2%			7.7%	23.1%	100.0%
Total	DJOUGOU	37	2	1	0	16	56
		66.1%	3.6%	1.8%	0.0%	28.6%	100.0%
	TCHAOUROU	18	1	6	0	20	45
		40.0%	2.2%	13.3%	0.0%	44.4%	100.0%
	Total	63	8	7	2	36	116
		54.3%	6.9%	6.0%	1.7%	31.0%	100.0%

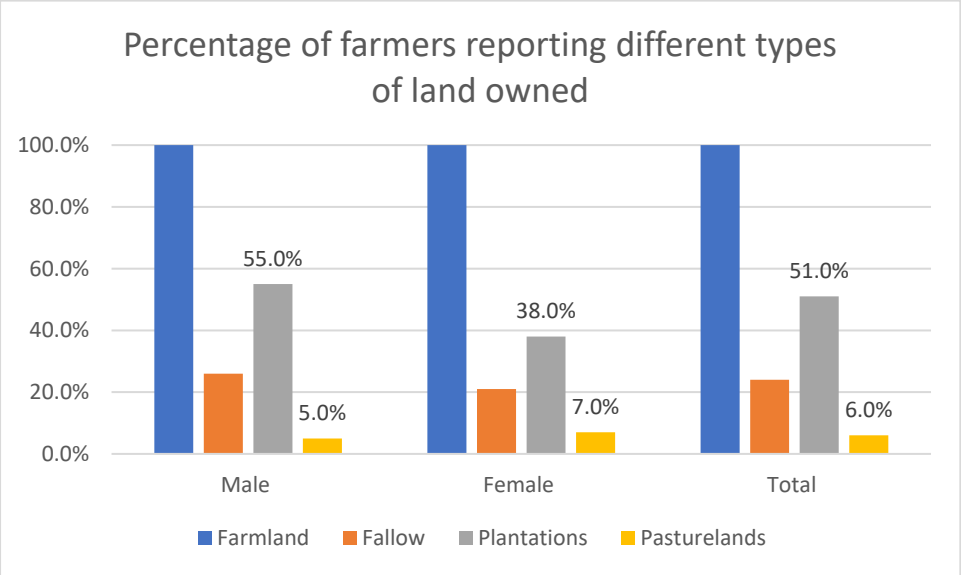


Figure 4.2: Uses of land owned

Table 4.10: Nature of land before farmer started using it

	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
Control	1	77	3	23	88	16
	.5%	37.0%	1.4%	11.1%	42.3%	7.7%
Beneficiary	39	168	13	83	126	30
	8.5%	36.6%	2.8%	18.1%	27.5%	6.5%
Male	29	175	11	83	173	31
	5.8%	34.9%	2.2%	16.5%	34.5%	6.2%
Female	11	70	5	23	41	15
	6.7%	42.4%	3.0%	13.9%	24.8%	9.1%
Total	40	245	16	106	214	46
	6.0%	36.7%	2.4%	15.9%	32.1%	6.9%

Most of the farmers reported that their lands were either wooded areas (36,7%) or forest areas 32% when they acquired it. More female respondents 42% claimed their land were wooded land compared to men and more men 34.5% claimed their land were forest land compared to women 24.8%. This may be related to the fact that access to the forest is against a fee and women did not have the resources to pay for land in the forest as the men.

Most of the farmers (62%) claim their land is in a degradation phase and more men (64.3 %) than women (55.2%) reported cases of land degradation (Table 4.11). Perception of land degradation varied between the municipalities with the highest number of cases reported in Djougou, Boukoumbé and Ouaké in this order (Table 4.12). Farmer reported several reasons for increasing soil degradation. The most cited by both male and female respondent (67%) was bad farming practices (Table 4.13).

Table 4.11: Perception of soil degradation segregated by respondents

	Improved fertility status	Soil in degradation phase	No change
Control	42	131	42
	20.2%	63.0%	20.2%
Beneficiary	105	283	84
	22.9%	61.7%	18.3%
Male	117	323	93
	23.3%	64.3%	18.5%
Female	30	91	33
	18.2%	55.2%	20.0%
Total	147	414	126
	22.0%	62.1%	18.9%

Table 4.12: Perception of soil fertility and degradation segregated by municipality

Councils	Improved fertility status	Soil in degradation phase	No change
BANIKOARA	0	27	2
	0.0%	27.6%	2.0%
BOUKOUMBE	24	70	26
	25.3%	73.7%	27.4%
COBLY	29	57	16
	32.6%	64.0%	18.0%
DASSA ZOUMÈ	5	56	9
	4.9%	54.9%	8.8%
DJOUGOU	12	66	16
	13.6%	75.0%	18.2%
OUAKE	27	71	22
	27.6%	72.4%	22.4%
TCHAOUROU	50	67	35
	51.5%	69.1%	36.1%
Total	147	414	126
	22.0%	62.1%	18.9%

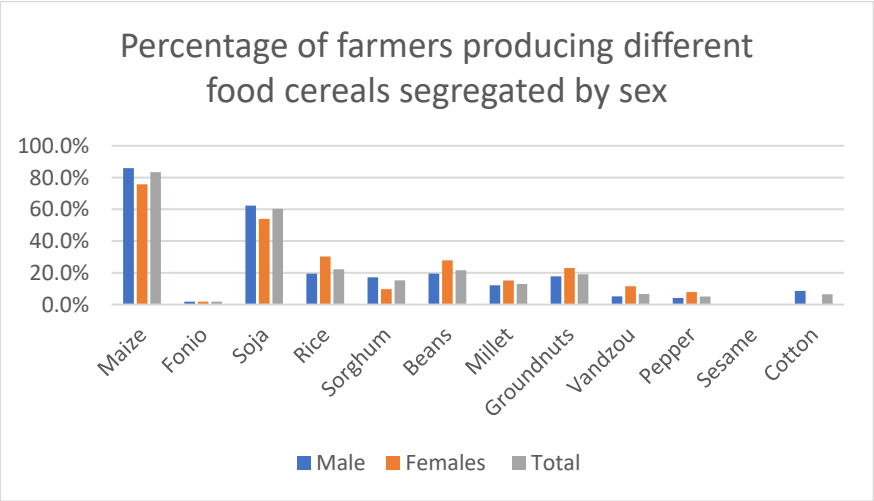
Table 4.13: Factors influencing soil degradation segregated by respondent type

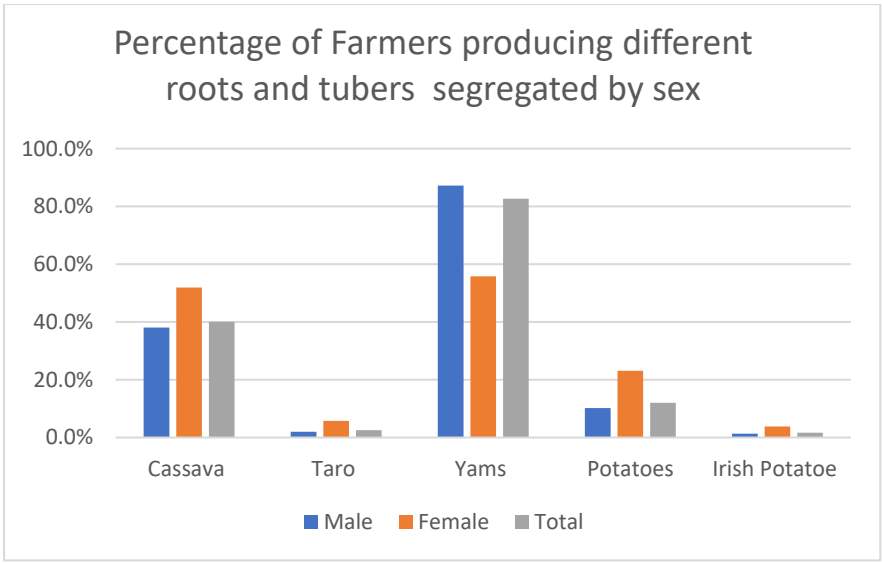
	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events	Applying fertilizer	pests and diseases	Others
Control	10	42	92	17	21	52	66	33	54	6	173
	7.6%	32.1%	69.7%	13.0%	16.0%	39.7%	50.0%	25.2%	41.2%	4.6%	83.2%
Beneficiary	37	107	187	31	58	80	147	66	80	36	379
	13.1%	37.7%	66.1%	11.0%	20.5%	28.3%	51.9%	23.3%	28.3%	12.7%	82.6%
Male	42	124	210	34	71	104	167	74	102	35	402
	13.0%	38.4%	65.0%	10.5%	22.0%	32.2%	51.7%	22.9%	31.6%	10.8%	80.1%
Female	5	25	69	14	8	28	46	25	32	7	150
	5.5%	27.2%	75.0%	15.4%	8.8%	30.8%	50.0%	27.5%	35.2%	7.7%	90.9%
Total	47	149	279	48	79	132	213	99	134	42	552
	11.4%	35.9%	67.2%	11.6%	19.1%	31.9%	51.3%	23.9%	32.4%	10.1%	82.8%

4.2. Sources of food and income

4.2.1. Farm products

The baseline found that most households generate farm and non-farm income. Agriculture or farm income was cited by all the households as major sources of income. Figures 4.3 and 4.4 show different crops grown and the percentages of respondents who grow the crops and also make income out of them. Maize and yams were the most common crops grown by a majority of the households, at least 83%. Cashew was the most cited tree crop grown by at least 20% of the respondents. More men compared to women were found to be involved in the cultivation of Yams and cashew compared to maize where the differences were not very significant.





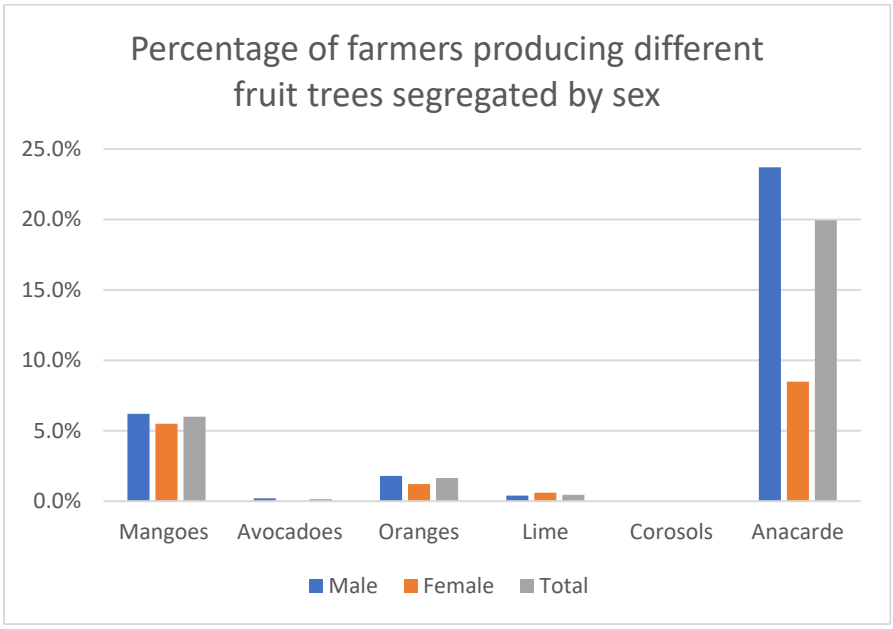
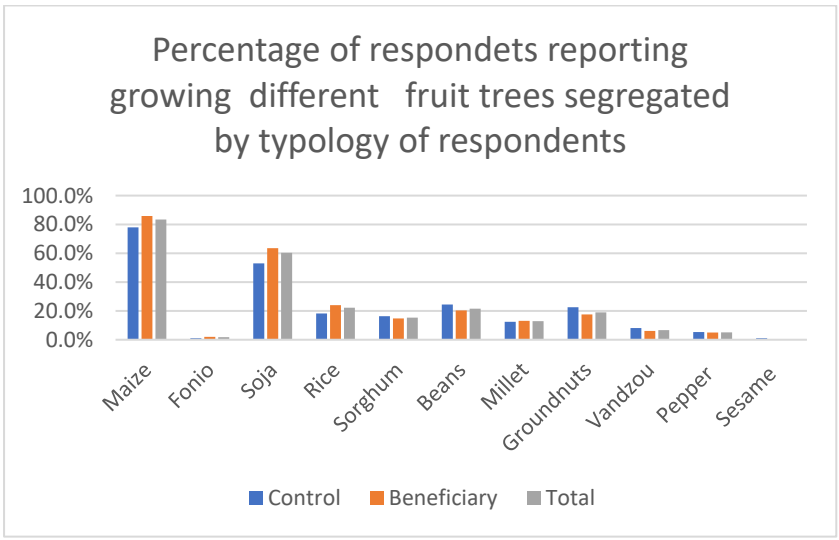


Figure 4.3: Percentage of farmers producing different food and trees crops segregated by sex



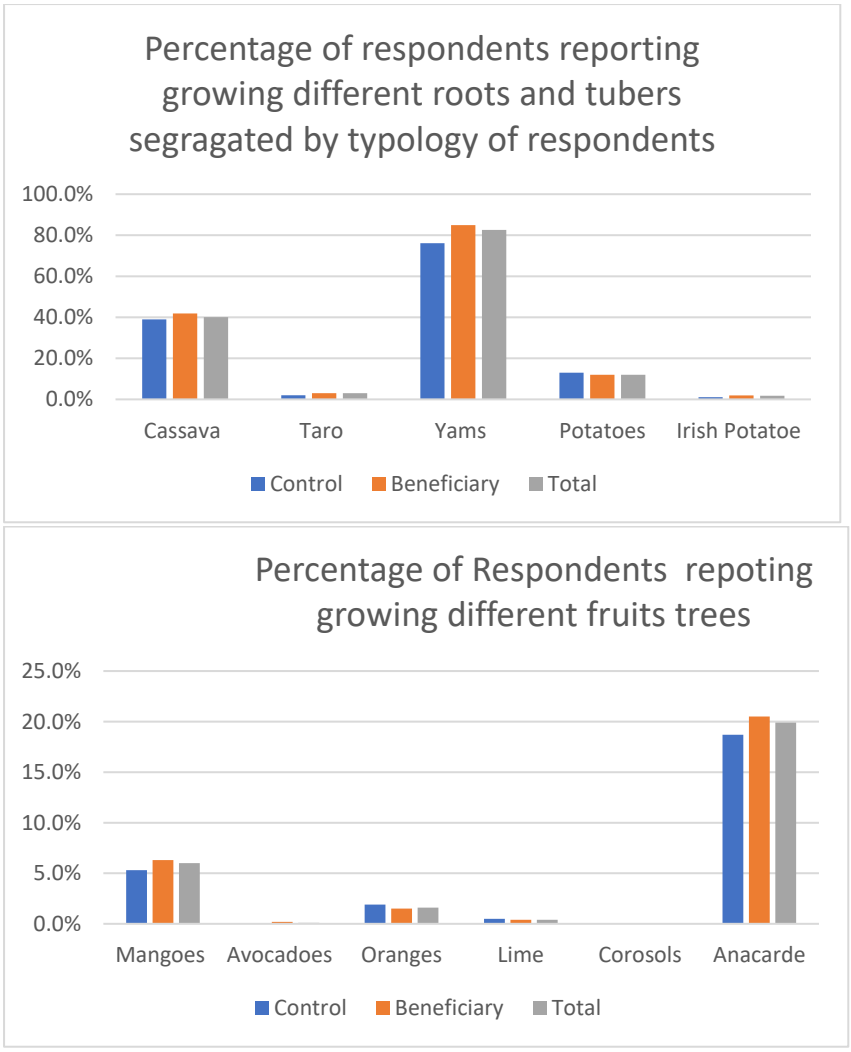


Figure 4.4: Percentage of farmers producing different food and trees crops segregated by typology of respondents

Cotton was found to generate the highest mean annual revenue over the past 12 months, but it was not amongst the crops that was farmed by most of the respondents (Table 4.14). Soja, yams and maize in this order are the other food crops that generated high annual revenues for farmers over the past 12 months.

Table 4.14: Mean annual revenue from cereals and leguminous crops overs the past 12 months

		Miaze	Soja	Ground-nuts	Coton	Fonio	Haricot	Millet	Fonio	Rice	Sor-ghum	Voandou
FEMININ	Mean	118,438	288,197	210,396		25,000	25,871	74,085	240,000	261,909	267,160	13,658
	SD	199,818	283,004	659,896			20,077	55,743		533,307	211,247	13,532
MASCULIN	Mean	287,872	565,560	164,353	1,459,225		80,774	53,463	229,138	498,230	115,380	56,200
	SD	558,000	848,446	217,404	1,987,169		82,889	51,180	188,181	1,244,469	104,194	60,731
Total	Mean	255,665	511,125	180,158	1,459,225	25,000	57,482	60,337	230,344	424,090	145,736	32,995
	SD	513,641	778,155	420,039	1,987,169		69,194	51,161	176,065	1,072,711	140,967	45,392
Fruit trees												
		Cashew	Citron	Mangoes	Orange							
FEMININ	Mean	369,093		12,825								
	SD	486,793		18,240								
MASCULIN	Mean	390,029	14,394	93,151	16,650							
	SD	1,204,694	14,198	183,695	13,083							
Total	Mean	385,327	14,394	75,783	16,650							
	SD	1,084,384	14,198	165,632	13,083							
Roots and tubers												
		Yams	Cassava	Potatoes								
FEMININ	Mean	216094	74148									
	SD	433941	76635									
MASCULIN	Mean	403905	158945	19536								
	SD	1012625	128239	8989								
Total	Mean	366641	141698	19536								
	SD	928513	123862	8989								

4.2.2. Non timber forest products and other forest products

The most common non timber forest products collected by farmers included karite, Nere and Baobab. For all these NTFPs, women (38%, 35% and 22% respectively) were the most involved in the collection compared to men (Table 4.15). Karite was found to be the NTFP that generated the most revenue (119252 XOF in the last 12 months) for women (Table 4.16).

Table 4.15: Number and percentage of respondents collecting different NTFPs segregated by gender and commune

Type of NTFPs	Sex	Commune							Total
		BANIKOARA	BOU-KOUMBE	COBLY	DASSA ZOUMÈ	DJOUGOU	OUAKE	TCHAOUROU	
Baobab	Male	5	24	14	6	0	9	0	58
		6.8%	42.9%	23.7%	10.9%	0.0%	9.8%	0.0%	11.6%
	Female	1	25	9	1	0	1	0	37
		5.6%	62.5%	28.1%	2.3%	0.0%	8.3%	0.0%	22.4%
	Total	6	49	23	7	0	10	0	95
		6.6%	51.0%	25.3%	7.1%	0.0%	9.6%	0.0%	14.2%
Vitex doniana akounmalakpa	Male	0	1	0	3	0	0	1	5
		0.0%	1.8%	0.0%	5.5%	0.0%	0.0%	1.2%	1.0%
	Female	0	1	0	2	0	0	1	4
		0.0%	2.5%	0.0%	4.7%	0.0%	0.0%	6.3%	2.4%
	Total	0	2	0	5	0	0	2	9
		0.0%	2.1%	0.0%	5.1%	0.0%	0.0%	2.0%	1.3%
Nere	Male	26	20	31	13	3	44	5	142
		35.6%	35.7%	52.5%	23.6%	3.5%	47.8%	6.1%	28.3%
	Female	7	14	20	12	0	2	2	57
		38.9%	35.0%	62.5%	27.9%	0.0%	16.7%	12.5%	34.5%
	Total	33	34	51	25	3	46	7	199
		36.3%	35.4%	56.0%	25.5%	3.4%	44.2%	7.1%	29.8%
Karite	Male	50	15	27	11	19	32	23	177
		68.5%	26.8%	45.8%	20.0%	22.4%	34.8%	28.0%	35.3%
	Female	14	9	18	11	2	4	5	63
		77.8%	22.5%	56.3%	25.6%	50.0%	33.3%	31.3%	38.2%
	Total	64	24	45	22	21	36	28	240
		70.3%	25.0%	49.5%	22.4%	23.6%	34.6%	28.6%	36.0%

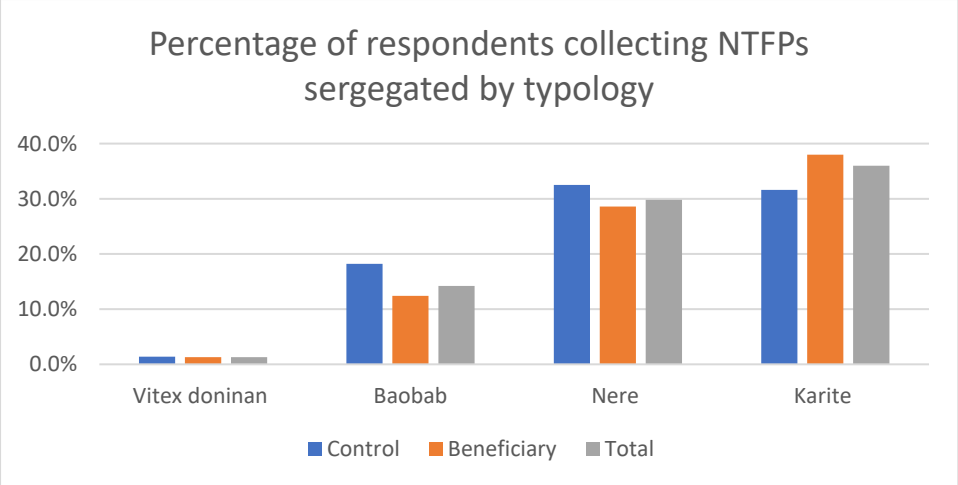


Figure 4.5: percentage of respondents who collect NTFP segregated by typology of respondents

Table 4.16: Mean annual revenue from NTFPs and other forest products over the las 12 months in XOF

		NTFPs						
		Baobab	Karite	Nere	Charbon	Planks/fire-wood	Nursery	Organic manure
FEMALE	Mean	32997	119252	58134	30525	262500		
	SD	28162	147540	89570	34931			
MALE	Mean	53710	54390	62993	34288	19750	77550	12500
	SD	103893	72422	92085	43555	14704	101726	16263
Total	Mean	48757	67166	61673	33413	46722	77550	12500
	SD	91713	95019	90876	41345	82077	101726	16263

4.2.4. Animal resources

The most common type of animals reared in all the studied areas include poultry, cattle and sheep. About 46% of the respondents, 41% and 48 % respectively from control and beneficiary communities do animal rearing and generate revenue from it. On average more women (47%) compared to men (45%) generate income from rearing animals (Table 4.17). Annual average revenue derived from animal resources is estimated at about 134,584 XOF (Table 4.18). Though more women than men are involved in animal rearing average annual revenue generated by men is relatively larger compared to those of women.

Table 4.17: Number and percentage of respondents deriving income from animal resources segregated by commune and control vs beneficiary respondents

Type of Tuber	Sex	Commune							Total
		BANIKOARA	BOUKOMBE	COBLY	DASSA ZOUMÈ	DJOUGOU	OUAKE	TCHAOUROU	
Animals	Male	43	20	35	33	24	50	22	227
		58.9%	35.7%	59.3%	60.0%	28.2%	54.3%	26.8%	45.2%
	Female	10	18	16	24	1	5	4	78
		55.6%	45.0%	50.0%	55.8%	25.0%	41.7%	25.0%	47.3%
	Total	53	38	51	57	25	55	26	305
		58.2%	39.6%	56.0%	58.2%	28.1%	52.9%	26.5%	45.7%

Table 4.18: Mean annual revenue from animal resources in the last 12 months in XOF

		N	Mean	Std. Deviation
Control	Male	52.0	84,980.8	127,275.6
	Female	34.0	84,450.0	146,860.8
	Total	86.0	84,770.9	134,510.3
Beneficiary	Male	175.0	91,374.7	147,462.5
	Female	44.0	39,181.8	45,253.9
	Total	219.0	80,888.4	134,905.7
Total	Male	227.0	89,910.0	142,844.9
	Female	78.0	58,914.1	104,391.3
	Total	305.0	81,983.2	134,584.4

4.2.5. Other sources of revenue

Besides agriculture, about 30% of the surveyed households reported other income sources over a year. The most important in terms of numbers for both men and women respondents were small businesses and other income (salaries and pensions) 28% each. There were no major differences between the sources of other income for men and women respondents (Figure 4.6). In terms of monetary value, small business 213000 XOF and formal loans 296,688 XOF were reported to be the sources with the highest average annual income (Table 4.19).

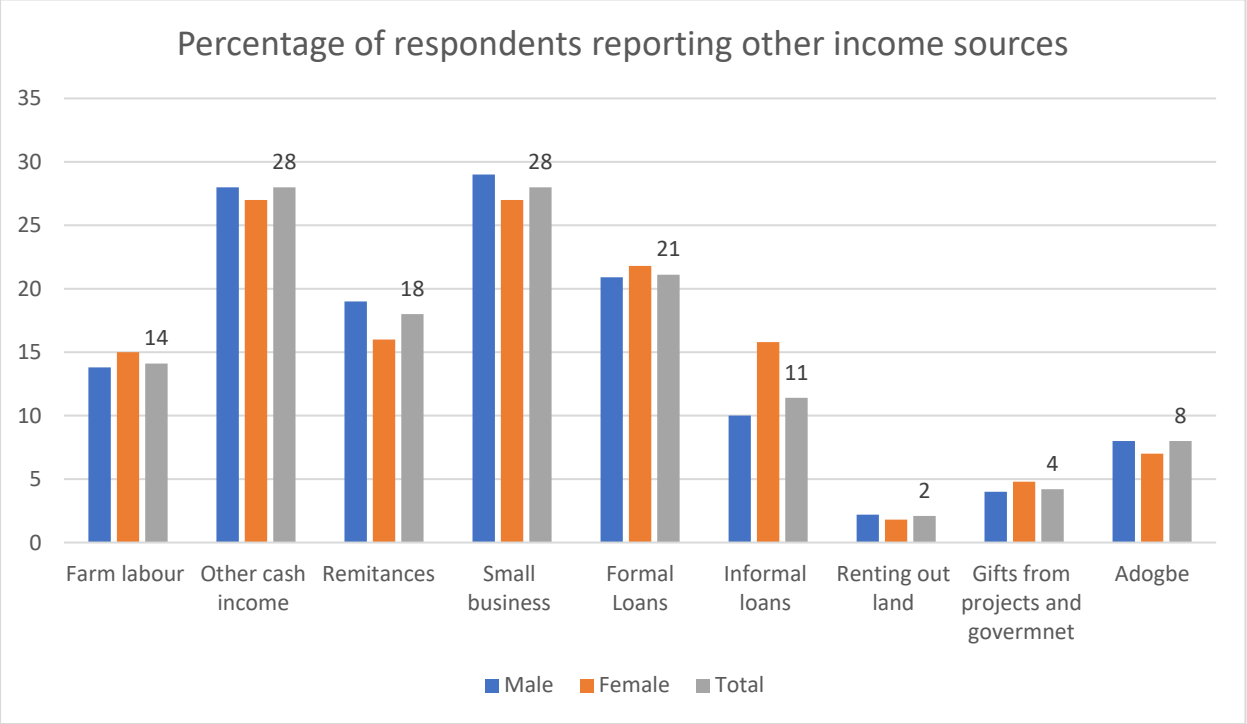


Figure 4.6: Income sources reported by respondents

Table 4.19: Mean annual income in the last 12 months from other sources in XOF

		Farm labour	Other cash income	Remit-tances	Small busi-ness	Formal Loans	Infor-mal loans	Rent-ing out own land	Adjogbe[5]
Control	Mean	82,200	66,717	70,609	166,643	250,985	117,271	40,833	1,667
	Std. Dev	136,335	84,773	78,086	234,926	283,440	209,286	44,093	2,887
	Median	25,000	30,000	30,000	60,000	200,000	47,500	27,500	0
Beneficiaries	Mean	154,326	209,551	67,368	232,694	320,818	89,737	120,606	105,240
	Std. Dev	505,032	669,625	132,163	890,154	562,931	194,315	111,118	147,910
	Median	40,000	50,000	30,000	70,000	200,000	25,600	100,000	46,000
Female	Mean	62,300	72,087	76,231	178,489	282,353	115,292	36,667	24,167
	Std. Dev	110,293	101,864	114,167	212,548	293,772	230,214	47,258	40,301
	Median	25,000	35,000	30,000	70,000	200,000	30,000	20,000	2,500
Male	Mean	151,083	193,617	66,095	223,885	297,359	93,260	104,405	113,227
	Std. Dev	471,278	636,813	121,706	859,699	520,577	188,986	104,549	155,578
	Median	40,000	50,000	30,000	70,000	200,000	30,000	67,500	48,000
Total	Mean	127,471	163,722	68,238	213,019	293,688	98,548	92,451	94,143
	Std. Dev	408,769	557,227	119,765	756,463	474,249	198,225	99,341	143,218
	Median	35,000	45,000	30,000	70,000	200,000	30,000	35,000	40,000

[5] Mutual jointed agricultural labour force.

4.3. Knowledge about Ecosystem based adaptation

The baseline study shows evidence of ecosystem-based adaptation practices in the studied municipalities. The EbA Knowledge varies with respect to the kind of adaptation practice. Crop rotation and the use of chemical fertilisers were the most reported, with at least 50% of both males and females of the beneficiary and control groups each reporting the use of the two technologies. Rainwater harvesting, mulching, and composting were the other most cited soil and water conservation practices, they were cited by at least 24% of the respondents (Table 4.20). The least cited was zaï. Additional information about the respondents segregated by municipality, gender and beneficiary vs control groups are presented in the appendix

Table 4.20: Percentage of farmers performing EbA practices: Soil and water conservation

EbA practices	Male	Female	Control	Beneficiary	Total
Crop rotation	71	61	67	69	69
Rainwater harvesting	26	30	25	28	27
Stone breaks	19	21	19	19	19
Mineral fertiliser	57	59	57	57	57
Mulching	25	25	27	24	25
Terracing	16	16	16	16	16
Composting/	35	42	35	37	36
Alley cropping	19	13	14	19	18
Zai	12	9	11	11	11
vegetation	15	15	15	15	15
cover crop	20	19	19	19	19
Irrigation	17	16	17	17	17
other	11	8.5	10	10	10

Survey results also show evidence of farmers practicing either tree planting or managing indigenous fruits trees. The most cited is shea (68%) followed by Nere (54%) and mangoes (54%). Except for cashew, women were more involved in collecting NTFPs compared to men. (Table 4.21)

Table 4.21: Percentage of farmers performing EbA practices: Improved fruit trees and seed banks

	Improved fruit trees										Seed bank	
Typology of respondents	Pomme cannelle	Cashew	Baobab	Karite	Orange	Nere	Mangoes	Tamarine	Others	Jujubier	Moringa	Baobab
Male	11	55	41	67	36	55	53	27	7	7	49	50
Female	11	49	50	70	38	66	58	41	12	14	59	61
control	10	43	35	60	29	52	47	25	9	9	51	44
Beneficary	12	58	48	71	41	61	57	33	8	8	44	57
Total	11	53	44	68	37	58	54	30	8	8	51	53

Farmers were generally not familiar with fodder practices nor were they conversant with FMNR, except for acacia where about 24% of the population practices it as an FMNR, some fodder and FMNR practices recorded as low as 4%. Conservation agriculture particularly zero tillage was practiced by about 42% of the respondents. More female (50%) compared to males (39%) reported practicing zero tillage (Table 4.22).

Table 4.22: Percentage of farmers performing EbA practices: fodder, NAR & conservation agriculture

Typology of Respondents	Fodder					Natural Assisted Regeneration				Conservation agriculture	
	Pterocarpus lucens	Gliricidia sepium	Commiphora africana myrrhe	Pterocarpus erinaceus Vene A102-T108	Prosopis africana	Lawsonia inermis	Live fencing	Jatropha curcas	Acacia nilotica	Zero tillage	Mulching
Male	12.6	8	3	11	8	5	4	12	20	39	19
Female	10	2	3	9	8	5	4	12	27	50	23
control	8.5	3	2	7	4	4	3	10	17	41	25
Beneficiary	14	8	4	12	11	5	5	13	24	42	17
Total	12	6	3	10	8	5	4	12	22	42	20

Table 4.23: Percentage of farmers performing EbA practices: agroforestry, restoration of degraded forest and nature-based enterprises

Typology of respondents	Agroforestry					Restoration of degraded forest		Nature based Enterprises			
	Improved fallow with accacia, cajanus	Faidherbia and shea parks	Tree plantation with Eucaleptus, neem	Natural assisted regeneration with local species	Fruit orchard	Enrichment planting	Sustaintable forest management and reduced fire	Apiculture	Firewood	Ecotourism	
Male	29	16	16	22	29	**26**	22	35	48	7	
Female	20	17	18	28	32	**23**	24	30	60	2	
control	19	12	12	26	26	**25**	16	27	46	4	
Beneficiary	31	19	19	22	32	**25**	25	38	54	7	
Total	27	16	16	24	30	**25**	22	33	51	6	

Adaptation strategies

Survey results show that communities have been experimenting various adaptation strategies. The three most common adaptation related changes identified by communities included: introduction of new crop varieties, testing any new crop variety and stopping growing a crop over a season. There were no major differences between male and female respondents on this variable (Table 4.24). Communities also

reported collecting wild fruits and vegetables as survival strategy. On average, more women than men depended on wild fruits to cope during months of food shortages which generally run between June and August when the first harvest seasons begins (fig 4.8).

Table 4.24: Adaptation strategies in relation to agriculture and tree products

Typology of respondents	Intro-duced any new crop	Testing any new crop (still not sure about)	Stopped growing a crop (totally)	Stopped growing a crop (in one season)	Introduced any tree species? Over some time	Testing any tree species (still not sure about)	Stopped growing a tree species (totally)
Male	27	22	13	20	16	14	13
Female	22	21	8	14	13	12	7
Control	27	25	9	17	15	13	11
Beneficiary	25	21	13	19	15	14	12
Total	26	22	12	18	15	14	11

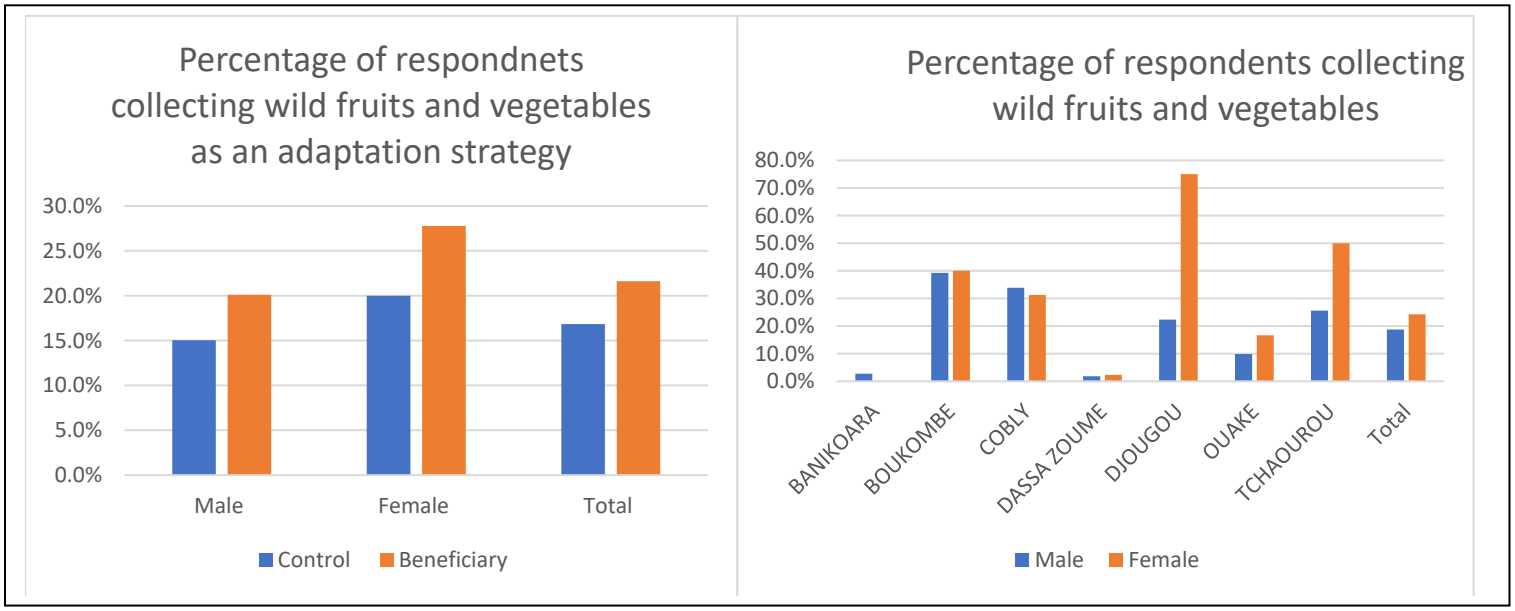


Figure 4.7: Percentage of farmers collecting wild fruits and vegetables

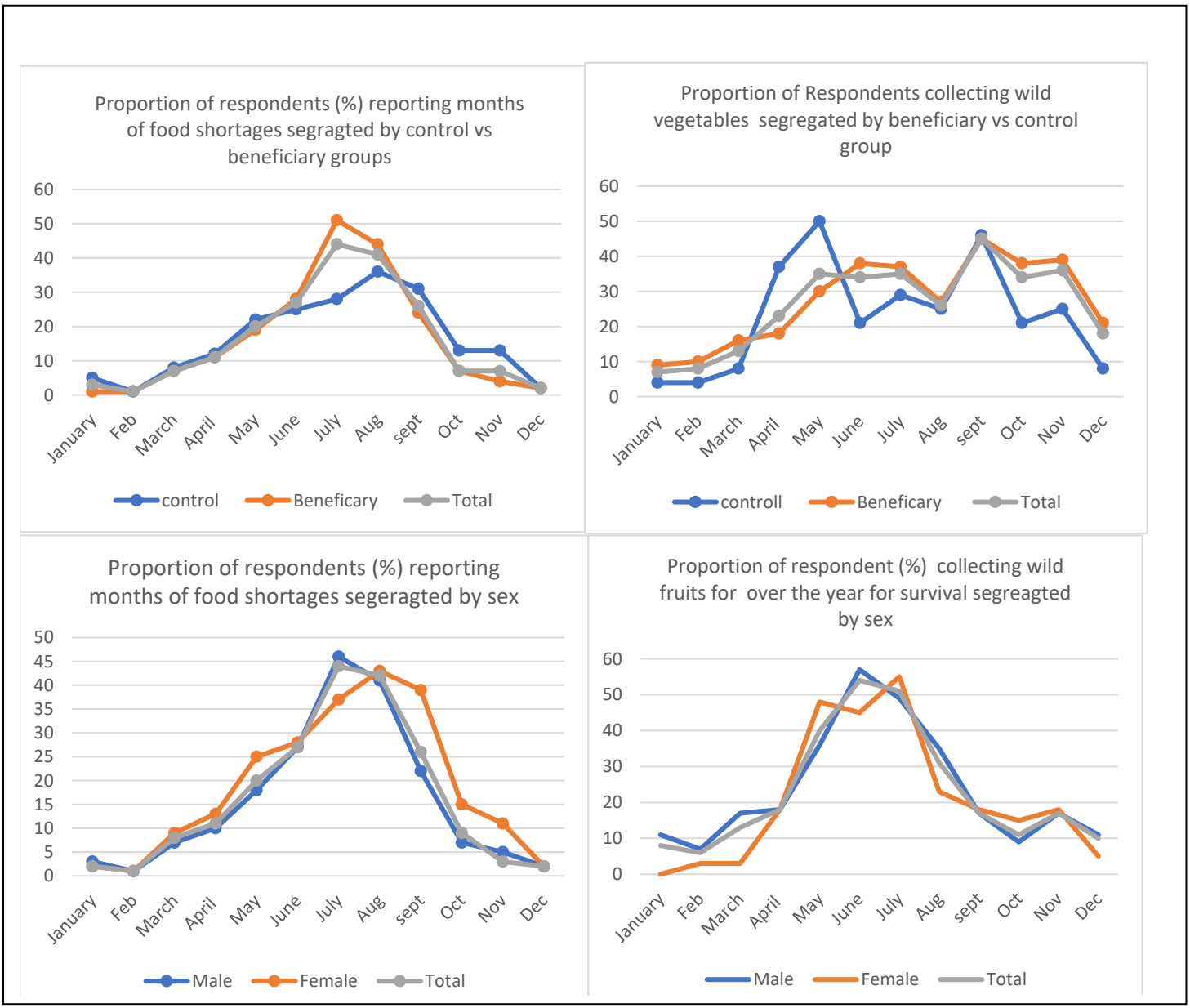


Figure 4.8: Months of food shortage and wild vegetables and wild fruits collection

4.5. Access to community utilities relevant for adaptation

The most common facilities that communities have access to are water pumps and bore holes. More male headed households than females reported having access to these facilities. When segregated by municipality, the two water sources were the most reported by each municipality. These water sources can be very crucial in developing irrigation systems or in setting up nurseries. None of the respondents reported having access to community radio that can be useful for the dissemination of climate information, however 75% of the respondents had access to mobile telephones that can be used to disseminate climate information (Tabe 4.25).

Table 4.25: Access to community utilities segregated by municipality

	Irriga-tion	Infrastructure reservoirs for wa-ter collection	Dams or water ponds	Bore-holes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
Control	7	14	49	86	15	7	137	8	12	25
	3.4%	6.7%	23.6%	41.3%	7.2%	3.4%	65.9%	3.8%	6.3%	13.8%
Beneficiary	16	35	67	196	30	21	279	23	62	42
	3.5%	7.6%	14.6%	42.7%	6.5%	4.6%	60.8%	5.0%	14.8%	11.1%
Male	17	35	91	222	37	19	327	26	51	41
	3.4%	7.0%	18.1%	44.2%	7.4%	3.8%	65.1%	5.2%	11.1%	9.7%
Female	6	14	25	60	8	9	89	5	23	26
	3.6%	8.5%	15.2%	36.4%	4.8%	5.5%	53.9%	3.0%	15.6%	18.7%
Total	23	49	116	282	45	28	416	31	74	67
	3.4%	7.3%	17.4%	42.3%	6.7%	4.2%	62.4%	4.6%	12.2%	11.9%

Table 4.26: Access to community utilities segregated by municipality

Councils	Irriga-tion	Infrastructure res-ervoirs for water collection	Dams or water ponds	Bore-holes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
BANIKOARA	0	0	6	5	0	0	82	3	12	46
	0.0%	0.0%	6.1%	5.1%	0.0%	0.0%	83.7%	3.1%	13.3%	51.1%
BOUKOUMBE	7	12	26	60	12	9	28	11	13	7
	7.4%	12.6%	27.4%	63.2%	12.6%	9.5%	29.5%	11.6%	14.3%	9.0%
COBLY	0	10	11	39	5	0	51	4	2	3
	0.0%	11.2%	12.4%	43.8%	5.6%	0.0%	57.3%	4.5%	2.4%	4.1%
DASSA ZOUMÈ	14	21	19	35	21	15	67	11	9	9
	13.7%	20.6%	18.6%	34.3%	20.6%	14.7%	65.7%	10.8%	13.4%	13.4%
DJOUGOU	0	0	15	56	4	0	72	2	11	2
	0.0%	0.0%	17.0%	63.6%	4.5%	0.0%	81.8%	2.3%	12.6%	2.3%
OUAKE	0	6	22	42	2	4	30	0	24	0
	0.0%	6.1%	22.4%	42.9%	2.0%	4.1%	30.6%	0.0%	24.5%	0.0%

Councils	Irriga-tion	Infrastructure res-ervoirs for water collection	Dams or water ponds	Bore-holes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
TCHAOUROU	2	0	17	45	1	0	86	0	3	0
	2.1%	0.0%	17.5%	46.4%	1.0%	0.0%	88.7%	0.0%	3.3%	0.0%
Total	23	49	116	282	45	28	416	31	74	67
	3.4%	7.3%	17.4%	42.3%	6.7%	4.2%	62.4%	4.6%	12.2%	11.9%

4.6 Tree planting initiatives

At least 57% of the respondents had planted at least one tree in the past year following data collection. Most of the farmers (29%) had planted less than 10 trees while 6.7% had planted more than 100 trees in the past year. More women (55.8 %) compared to men (38.4%) had not planted any tree (table 4.27). More farmers in the commune of Tchaourou (86.6%) and Djougou (70.5%) had planted at least one tree compared to the other communes. Banikoara is the commune with the highest number of respondents who had not planted any tree in the past year.

Table 4.27: Number and percentage of farmers who planted trees in the past segregated by respondents

	None	Less than 10	11 to 50	51 to 100	More than 100
Control	95	57	19	21	16
	45.7%	27.4%	9.1%	10.1%	7.7%
Beneficiary	190	137	56	47	29
	41.4%	29.8%	12.2%	10.2%	6.3%
Male	193	152	65	55	37
	38.4%	30.3%	12.9%	11.0%	7.4%
Female	92	42	10	13	8
	55.8%	25.5%	6.1%	7.9%	4.8%
Total	285	194	75	68	45
	42.7%	29.1%	11.2%	10.2%	6.7%

Table 4.28: Number and percentage of farmers who planted trees in past year segregated by municipality

Councils	None	Less than 10	11 to 50	51 to 100	More than 100
BANIKOARA	78	14	3	2	1
	79.6%	14.3%	3.1%	2.0%	1.0%
BOUKOMBE	39	43	2	9	2
	41.1%	45.3%	2.1%	9.5%	2.1%
COBLY	31	35	10	11	2
	34.8%	39.3%	11.2%	12.4%	2.2%
DASSA ZOUMÈ	54	26	11	9	2
	52.9%	25.5%	10.8%	8.8%	2.0%
DJOUGOU	26	22	13	11	16
	29.5%	25.0%	14.8%	12.5%	18.2%
OUAKE	44	22	17	11	4
	44.9%	22.4%	17.3%	11.2%	4.1%
TCHAOUROU	13	32	19	15	18
	13.4%	33.0%	19.6%	15.5%	18.6%
Total	285	194	75	68	45
	42.7%	29.1%	11.2%	10.2%	6.7%

Survey results show that at least 76% of the respondents had protected at least one tree in the past year with more men (79.5%) than women (66%) protecting trees. More farmers in Tchaourou (87%) and Djougou (86.4%) had protected at least one tree compared to farmers from any of the municipalities in the past year before the survey (Tables 4.29 and 4.30). The most common reason cited by both men and women for protecting trees were either for food or shelter (Table 4.31). Farmers declared they would

need support to plant more trees. The most cited reasons given by the respondents include provision of farm equipment, provision of planting material, and training to plant trees and manage planted trees.

Table 4.29: Number and percentage of farmers protecting tree segregated by typology of respondents

	None	Less than 10	11 to 50	51 to 100	More than 100
Control	57	96	23	12	20
	27.4%	46.2%	11.1%	5.8%	9.6%
Beneficiary	102	205	59	52	41
	22.2%	44.7%	12.9%	11.3%	8.9%
Male	103	231	69	48	51
	20.5%	46.0%	13.7%	9.6%	10.2%
Female	56	70	13	16	10
	33.9%	42.4%	7.9%	9.7%	6.1%
Total	159	301	82	64	61
	23.8%	45.1%	12.3%	9.6%	9.1%

Table 4.30: Number and percentage of farmers protecting trees segregated by commune

Councils	None	Less than 10	11 to 50	51 to 100	More than 100
BANIKOARA	34	62	1	1	0
	34.7%	63.3%	1.0%	1.0%	0.0%
BOUKOMBE	25	53	7	8	2
	26.3%	55.8%	7.4%	8.4%	2.1%
COBLY	20	47	8	6	8
	22.5%	52.8%	9.0%	6.7%	9.0%
DASSA ZOUMÈ	32	50	14	1	5
	31.4%	49.0%	13.7%	1.0%	4.9%
DJOUGOU	12	24	15	17	20
	13.6%	27.3%	17.0%	19.3%	22.7%
OUAKE	24	28	21	14	11
	24.5%	28.6%	21.4%	14.3%	11.2%
TCHAOUROU	12	37	16	17	15
	12.4%	38.1%	16.5%	17.5%	15.5%
Total	159	301	82	64	61
	23.8%	45.1%	12.3%	9.6%	9.1%

Table 4.31: Reasons for protecting tree segregated by typology of respondents

	Food	Fodder	Fire-wood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
Control	126	1	61	86	22	18	83	27	38
	60.6%	.5%	29.3%	41.3%	10.6%	8.7%	39.9%	13.0%	20.1%
Beneficiary	321	15	163	217	81	49	218	73	50

	Food	Fodder	Fire-wood	Shade	Controls soil and wind ero-sion	Delineation	Medici-nal	Others	None
	69.9%	3.3%	35.5%	47.3%	17.6%	10.7%	47.5%	15.9%	11.9%
Male	344	10	163	228	80	56	235	72	57
	68.5%	2.0%	32.5%	45.4%	15.9%	11.2%	46.8%	14.3%	12.4%
Female	103	6	61	75	23	11	66	28	31
	62.4%	3.6%	37.0%	45.5%	13.9%	6.7%	40.0%	17.0%	21.1%

Table 4.32: Reasons for protecting trees segregated by commune

Councils	Food	Fod-der	Fire-wood	Shade	Controls soil and wind erosion	Deline-ation	Medic-inal	Others	None
BANIKOARA	43	0	37	46	3	0	24	30	15
	43.9%	0.0%	37.8%	46.9%	3.1%	0.0%	24.5%	30.6%	16.7%
BOUKOUMBE	71	9	44	50	20	14	49	9	25
	74.7%	9.5%	46.3%	52.6%	21.1%	14.7%	51.6%	9.5%	27.5%
COBLY	71	3	36	45	31	3	61	6	9
	79.8%	3.4%	40.4%	50.6%	34.8%	3.4%	68.5%	6.7%	10.7%
DASSA ZOUMÈ	59	2	21	45	6	5	34	21	13
	57.8%	2.0%	20.6%	44.1%	5.9%	4.9%	33.3%	20.6%	19.4%
DJOUGOU	63	0	22	34	10	12	32	6	7
	71.6%	0.0%	25.0%	38.6%	11.4%	13.6%	36.4%	6.8%	8.0%
OUAKE	70	2	40	46	26	11	60	13	15
	71.4%	2.0%	40.8%	46.9%	26.5%	11.2%	61.2%	13.3%	15.3%
TCHAOUROU	70	0	24	37	7	22	41	15	4
	72.2%	0.0%	24.7%	38.1%	7.2%	22.7%	42.3%	15.5%	4.4%
Total	447	16	224	303	103	67	301	100	88
	67.0%	2.4%	33.6%	45.4%	15.4%	10.0%	45.1%	15.0%	14.5%

Table 4.33: Support needed by farmers to plant more tree segregated by typology of respondents

	Planting material, e.g. han-dles	Training on Manage-ment of planted trees	Farm equipment to manage trees	Land for planting trees	Water supply	None	Others
Control	104	90	129	98	95	16	21
	50.0%	43.3%	62.0%	47.1%	45.7%	8.8%	11.6%
Beneficiary	202	180	233	205	185	43	52
	44.0%	39.2%	50.8%	44.7%	40.3%	11.3%	13.7%
Male	226	197	276	241	199	40	47
	45.0%	39.2%	55.0%	48.0%	39.6%	9.5%	11.1%
Female	80	73	86	62	81	19	26
	48.5%	44.2%	52.1%	37.6%	49.1%	13.7%	18.7%
Total	306	270	362	303	280	59	73
	45.9%	40.5%	54.3%	45.4%	42.0%	10.5%	13.0%

Table 4.34: Support needed by farmers to plant more tree segregated by typology of respondents

Councils	Planting material, e.g. handles	Training Management of planted trees	Farm equipment to manage trees	Land for planting trees	Water supply	None	Others
BANIKOARA	27	34	44	18	26	12	26
	27.6%	34.7%	44.9%	18.4%	26.5%	13.3%	28.9%
BOUKOUMBE	49	48	57	45	51	8	9
	51.6%	50.5%	60.0%	47.4%	53.7%	10.3%	11.5%
COBLY	53	36	55	51	45	2	3
	59.6%	40.4%	61.8%	57.3%	50.6%	2.7%	4.1%
DASSA ZOUMÈ	48	52	53	31	39	10	9
	47.1%	51.0%	52.0%	30.4%	38.2%	14.9%	13.4%
DJOUGOU	35	31	33	51	24	11	13
	39.8%	35.2%	37.5%	58.0%	27.3%	12.6%	14.9%
OUAKE	53	37	62	42	46	9	11
	54.1%	37.8%	63.3%	42.9%	46.9%	9.9%	12.1%
TCHAOUROU	41	32	58	65	49	7	2
	42.3%	33.0%	59.8%	67.0%	50.5%	9.3%	2.7%
Total	306	270	362	303	280	59	73
	45.9%	40.5%	54.3%	45.4%	42.0%	10.5%	13.0%

Species of trees that are becoming rare

Farmers listed species of trees that are becoming scarce in the community. About 14 different species were cited at least 10 times for a total of the 571 citations in this category. Species with less than ten citations were not included in this analysis. The most cited were karite (*Vitellaria paradoxa*), Kosso (*Afzelia Africana*) Nere (*Parkia biglobosa*) and baobab (*Adansonia digitata*) each of which were cited more than 70 times. The most important reasons given by the farmers to explain the disappearance of the species include deforestation, bush fires, and demographic pressure.

Table 31: Native trees disappearing and cited at least 10 times

Tree Species	Scientific Name	Frequency
Karité	*Vitellaria paradoxa*	118
Kosso or Kpakpa	*Afzelia africana*	169
Néré	*Parkia biglobosa*	87
Baobab	*Adansonia digitata*	72
Iroko	*Milicia excelsa*	29
Caïlcédrat ou Gbirou	*Khaya senegalensis*	70
Tona (bariba)	*Pterocarpus erinaceus*	15
Agni	*Terminalia leocarpa*	11
Total		571

4.7 Access to inputs and credits

Results of the survey show that respondents generally have problems with access to planting materials. Only 14% of the respondents declared that they produced any planting material the year before the surveys, another 9% declared that they bought some seeds. About 3.6% and 1.9 % declared they got planting material from NGOs and Government programmes respectively. Tchaourou, Cobly and

Djougou were the municipalities with the highest number of respondents who claimed to have produced tree planting materials.

Table 4.35: Sources of tree planting materials the previous year -number and percentage segregated by typology of respondents

	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
Control	29	16	10	2	8
	13.9%	7.7%	4.8%	1.0%	4.0%
Beneficiary	65	44	14	11	9
	14.2%	9.6%	3.1%	2.4%	2.1%
Male	81	52	17	12	16
	16.1%	10.4%	3.4%	2.4%	3.4%
Female	13	8	7	1	1
	7.9%	4.8%	4.2%	.6%	.6%
Total	94	60	24	13	17
	14.1%	9.0%	3.6%	1.9%	2.7%

Table 4.36: Sources of tree planting materials the previous year -number and percentage segregated by typology of respondents

Municipality	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
BANIKOARA	1	1	1	1	0
	1.0%	1.0%	1.0%	1.0%	0.0%
BOUKOUMBE	10	13	5	3	6
	10.5%	13.7%	5.3%	3.2%	6.7%
COBLY	23	11	8	2	6
	25.8%	12.4%	9.0%	2.2%	7.2%
DASSA ZOUMÈ	3	9	0	2	0
	2.9%	8.8%	0.0%	2.0%	0.0%
DJOUGOU	14	1	5	4	1
	15.9%	1.1%	5.7%	4.5%	1.4%
OUAKE	18	20	2	0	4
	18.4%	20.4%	2.0%	0.0%	4.1%
TCHAOUROU	25	5	3	1	0
	25.8%	5.2%	3.1%	1.0%	0.0%
Total	94	60	24	13	17
	14.1%	9.0%	3.6%	1.9%	2.7%

Survey results also show that the most common inputs that farmers bought and used the previous year were herbicides, inorganic fertilizers and improved seeds reported by 75%, 34%nd 22 % of the respondents. Only 19% of the respondents had access to loans (Tables 4.37 and 4.38).

Table 4.37: Access to inputs and credits.

	Use of purchased certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
Control	50	74	147	23	52	13	
	24.0%	35.6%	70.7%	11.1%	25.0%	7.2%	
Beneficiary	98	157	351	60	79	16	2
	21.4%	34.3%	76.5%	13.1%	17.2%	4.2%	9.1%
Male	123	173	387	66	103	27	2
	24.5%	34.5%	77.1%	13.1%	20.6%	6.4%	1.9%
Female	25	58	111	17	28	2	0
	15.2%	35.2%	67.3%	10.3%	17.0%	1.4%	0.0%
Total	148	231	498	83	131	29	
	22.2%	34.7%	74.7%	12.4%	19.7%	5.2%	

Table 4.38: Access to inputs and credits segregated by municipality

Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
BANIKOARA	3	32	65	6	12	0	0
	3.1%	32.7%	66.3%	6.1%	12.2%	0.0%	0.0%
BOUKOUMBE	22	49	72	20	15	5	0
	23.2%	51.6%	75.8%	21.1%	15.8%	6.4%	0.0%
COBLY	15	28	67	13	18	0	0
	16.9%	31.5%	75.3%	14.6%	20.2%	0.0%	0.0%
DASSA ZOUMÈ	16	39	61	7	17	0	0
	15.7%	38.2%	59.8%	6.9%	16.7%	0.0%	0.0%
DJOUGOU	33	12	66	10	28	12	0
	37.5%	13.6%	75.0%	11.4%	31.8%	13.8%	0.0%
OUAKE	17	65	79	23	11	2	2
	17.3%	66.3%	80.6%	23.5%	11.2%	2.2%	1.5%
TCHAOUROU	42	6	88	4	30	10	
	43.3%	6.3%	90.7%	4.1%	31.3%	13.3%	
Total	148	231	498	83	131	29	
	22.2%	34.7%	74.7%	12.4%	19.7%	5.2%	

4.8. Social capital for adaptation and climate related risks and exposure

Respondents listed a number of social groups to which they belong. Survey results (table 4.39) suggest that a majority of the respondents do not belong to social groups thus presenting a weak social capital for adaptation. The most cited groups, were marketing groups (32%), followed by savings (22.5%) loan groups (18.8%) and productivity enhancement groups. More women than men belonged to these groups. Membership in such groups enhances diversification and adaptive capacity of members as they are often sources of loans and information. However, survey results (table 38) indicates that in case of climate

crises, a majority of the respondents did not receive any assistance and only 4% were rescued by the local organisation to which they belong..

Table 4.39: Membership in different association

Items	Control sites		Beneficiary sites		Male		Female		Total	
Productivity enhancement/value addition (i.e. livestock, crops, trees or fish)	25	16.0%	60	20.3%	63	18.4%	22	20.2%	85	18.8%
Sewing	10	7.2%	22	8.4%	23	7.5%	9	9.5%	32	8.0%
Nursery/tree planting	6	4.1%	15	5.4%	15	4.7%	6	5.8%	21	4.9%
Soil improvement activities	17	11.6%	23	8.4%	27	8.5%	13	12.6%	40	9.5%
Beekeeping	4	2.8%	19	7.1%	20	6.5%	3	3.0%	23	5.6%
Seed production	9	6.3%	14	5.3%	14	4.5%	9	8.9%	23	5.6%
Vegetable production	9	6.3%	21	7.7%	24	7.7%	6	5.8%	30	7.3%
Collection of forest products, exp . seeds, nuts, shea, neem	22	15.2%	44	16.4%	42	13.5%	24	23.5%	66	16.0%
Ecotourism (Nature trails/walks, guides)	1	.7%	7	2.7%	5	1.6%	3	3.0%	8	2.0%
Fish/shrimp ponds	1	.7%	7	2.7%	5	1.6%	3	3.0%	8	2.0%
Introduction/crop substitution	6	4.2%	12	4.6%	14	4.6%	4	4.0%	18	4.5%
Fishing	3	2.1%	8	3.1%	10	3.3%	1	1.0%	11	2.7%
Commercialization of agricultural products (i.e. livestock, crops, trees or fish)	49	33.6%	83	31.6%	97	31.6%	35	34.3%	132	32.3%
Savings and/or credit	42	28.4%	51	19.2%	58	18.8%	35	33.3%	93	22.5%
Irrigation	1	.7%	5	2.0%	5	1.7%	1	1.0%	6	1.5%

Table 4.40: Sources of assistance in case of climate crises over the past five years

	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
Control	24	1	1	2	2	1	66	2
	25.3%	1.1%	1.1%	2.1%	2.1%	1.1%	80.5%	2.4%
Beneficiary	40	3	5	9	2	8	164	5
	18.3%	1.4%	2.3%	4.1%	.9%	3.7%	88.6%	2.7%
Male	52	3	5	7	4	6	173	7
	21.6%	1.2%	2.1%	2.9%	1.7%	2.5%	84.0%	3.4%
Female	12	1	1	4		3	57	
	16.7%	1.4%	1.4%	5.6%		4.2%	93.4%	
Total	64	4	6	11	4	9	230	7
	20.4%	1.3%	1.9%	3.5%	1.3%	2.9%	86.1%	2.6%

Respondents listed several challenges faced by the groups in their communities or to which they belong. Human wildlife conflict was the most listed followed by illegal logging. Cases of illegal logging were most cited in Tchaourou and Djougou where there are protected forest compared to the other municipalities. The high number of human life conflicts must have been confused with farmer graziers' conflicts that are common in the area. More females than men reported cases of illegal extraction of wood. This may be related to the fact that men are those that are more involved in the activity than women.

Table 4.41: Major challenges faced by community forest and other social groups segregated by municipality

Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
BANIKOARA	24	5	4	13	28	24	6	10
	88.9%	83.3%	66.7%	81.3%	87.5%	100.0%	85.7%	28.6%
BOUKOUMBE	18	10	13	12	28	20	9	30
	75.0%	58.8%	48.1%	63.2%	70.0%	87.0%	64.3%	73.2%
COBLY	18	12	17	17	30	19	13	20
	90.0%	75.0%	68.0%	58.6%	69.8%	76.0%	81.3%	71.4%
DASSA ZOUMÈ	41	8	9	28	43	36	9	18
	91.1%	80.0%	90.0%	93.3%	86.0%	97.3%	90.0%	34.6%
DJOUGOU	30	14	22	36	51	22	27	14
	93.8%	93.3%	84.6%	94.7%	96.2%	91.7%	96.4%	73.7%
OUAKE	16	18	8	21	28	5	14	21
	61.5%	66.7%	61.5%	75.0%	73.7%	83.3%	82.4%	63.6%
TCHAOUROU	62	40	38	41	60	37	43	30
	93.9%	95.2%	84.4%	85.4%	92.3%	88.1%	95.6%	62.5%
Total	209	107	111	168	268	163	121	143
	87.1%	80.5%	73.0%	80.8%	83.5%	90.1%	88.3%	55.9%

Table 4.42: Major challenges faced by community forest and other social groups segregated by sex

	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
Control	79	44	49	67	85	66	50	43
	92.9%	86.3%	89.1%	84.8%	85.9%	89.2%	92.6%	55.1%
Beneficiary	130	63	62	101	183	97	71	100
	83.9%	76.8%	63.9%	78.3%	82.4%	90.7%	85.5%	56.2%
Male	168	88	89	137	208	119	99	114
	86.2%	82.2%	74.8%	81.5%	83.2%	90.2%	89.2%	56.7%
Female	41	19	22	31	60	44	22	29
	91.1%	73.1%	66.7%	77.5%	84.5%	89.8%	84.6%	52.7%
Total	209	107	111	168	268	163	121	143
	87.1%	80.5%	73.0%	80.8%	83.5%	90.1%	88.3%	55.9%

Table 4.43: Participation in Eba related trainings or tools segregated by beneficiary

	1 to 3 times	4 to 6 times	more than 6 times
Control	10	5	2
	58.8%	29.4%	11.8%
Beneficiary	22	11	2
	62.9%	31.4%	5.7%
Male	21	13	2
	58.3%	36.1%	5.6%
Female	11	3	2
	68.8%	18.8%	12.5%
Total	32	16	4
	61.5%	30.8%	7.7%

Respondents were asked if they were aware of EbA policies, tools or had participated in similar training or any event as an individual or member of community group. Survey results show that only 8% (55 respondents) had had any of such opportunities amongst which 61% of had attended the training between 1 to 3 times. More females (68.8%) than men had participated in EbA related policy /tools trainings between 1 to 3 times compared to men (30.6 %). Survey results further showed disparities within the municipalities with Dassa-Zoumè , Ouaké and Boukoumbé in this order reporting the most cases in the 1-3 category (Table 4.44).

Table 4.44: Participation in Eba related trainings or tools segregated by commune

Councils	1 to 3 times	4 to 6 times	more than 6 times
BANIKOARA	1	1	1
	33.3%	33.3%	33.3%
BOUKOUMBE	9	3	1
	69.2%	23.1%	7.7%
COBLY	2	3	1
	33.3%	50.0%	16.7%
DASSA ZOUMÈ	4	0	1
	80.0%	0.0%	20.0%
DJOUGOU	3	4	0
	42.9%	57.1%	0.0%
OUAKE	11	3	0
	78.6%	21.4%	0.0%
TCHAOUROU	2	2	0
	50.0%	50.0%	0.0%
Total	32	16	4
	61.5%	30.8%	7.7%

The baseline also collected information on farmers participation in trainings on nature-based adaptation e.g. on farm and off farm benefits of tree planting through public or private extension services in the last twelve months. Survey results show that only 7% of the respondents had participated in at least one training with more men than women participating.

Table 4.45: Participation in trainings on nature-based adaptation in the past year segregated by respondent type

	1 to 3	4 to 6	More than 6
Control	14	2	1
	6.7%	1.0%	.5%
Beneficiary	23	8	1
	5.0%	1.7%	.2%
Male	32	6	1
	6.4%	1.2%	.2%
Female	5	4	1
	3.0%	2.4%	.6%
Total	37	10	2
	5.5%	1.5%	.3%

References

Denz F, Huys, C. Silvestrin S. Indicators Matter to LNOB An indicator toolbox to leave no one behind in fighting poverty and inequality A practical guide for project designers and implementers. GIZ. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

ANNEXES

Annex 1: Monitoring and Evaluation logframe

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
Impact based on GCF indicators	A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions	A.1.2 Numbers of males and females benefiting from the adoption of diversified, climate resilient livelihood options	Total number of males and females who adopted diversified climate resilient livelihood options	Baseline Survey: describing sources of Revenues, And adaptation strategies.	4,000 women and 4,000 men benefit from climate resilient livelihoods	11,000 women and 11,000 men benefit from climate resilient livelihoods	Random sampling; Project-level field surveys comprising interviews with local communities	Baseline Midterm and end of project	PABE	Report	Climate resilient agricultural strategies will improve the resilience of ecosystems and ecosystem services
	A4.0 Improved resilience of ecosystems and ecosystem services	A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change.	Level of degradation on at least 3600ha of land	3600 hectares of land; the extent of degradation on will be established in the start-up phase of the project.	1,200 ha of degraded forests protected and strengthened in response to climate variability and change.	3,600 ha of degraded forests protected and strengthened in response to climate variability and change.	GIS mapping of project intervention sites	Baseline Midterm and end of project	PABE	Report	The EbA measures implemented are effective in increasing resilience and improving the livelihoods of vulnerable people
Outcome measured by GCF indicators	A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	Use by vulnerable communities, businesses, and public-sector services of Fund supported tools,	Number and type of actors using different capacity development tools, instruments and strategies developed by	Zero	Tools and instruments developed by year 3: national knowledge hub, website; policy and	30% of 22,000 people in 7 communities, 30% of technical officers in the 7 Districts and 20% of	Scorecard approach targeting beneficiary communities and technical officers in districts,	Baseline Midterm and end of project	PABE	Report	The tools, instruments, strategies and activities developed by the project will improve adaptive capacity.

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
		instruments, strategies and activities to respond to climate change and variability.	the project: e.g training manuals, EBA technical bulletins		information briefs; draft revisions to Forest Law and to associated strategies and policies; mainstreaming ng guidelines	technical officers in municipal and central government t using Fund supported tools, instruments, strategies and activities to respond to climate change	municipalities s and central government				
Outcome base on project logical framework. Divine	O1. . 3,600 hectares of land restored for multi-use energy and livelihood benefits.	Number of ha of land restored for multi-use energy and livelihood benefits	The number and of land that will be restored/planted for multipurpose use including energy, livelihoods benefits	Zero	1200 ha of land restored for multiple use including energy, and livelihoods benefits	3600ha of land restored for multiple use including energy and livelihoods	Farm surveys and forest mapping of restored areas, GIS mapping Report of reception of reforestation sites/activities	Baseline, Midterm [6] and end term	PABE	Report	
	O2. Higher productivity from agricultural livelihoods secured in the	Increased average yields of major crops per ha. Increased revenue from	The increase in yields, per ha of different crops including revenue	Baseline and consultancy report on production	20% of 22 000 beneficiaries increase their yields by 20%	Yields of 50% of 22 000 beneficiaries increase by 20%.	Farm surveys, area measurement	Baseline, Midterm and end term	PABE	Report	Data for estimating yield at farmers level will be available

[6] (Time frame defined by midterm will be agreed upon based on observed delays, it can be defined 1yr 1-5)

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
	face of climate change	marketing and processing Increased nutrition and food security		and productivity							
	O3. Strengthened technical and institutional capacity of the government and communities for implementing EbA and climate resilient agriculture and enhanced awareness of the adaptation benefits	Increased /awareness and uptake of EbA and climate resilient agriculture approaches by government in revised forest and agricultural policies. and communities (see project doc pg 20)	The number and type of Government and community services that implement EbA practices or who report strengthened capacity to implement EbA	Zero	Tools and instruments developed by year 3: national knowledge hub, website; policy and information briefs; draft revisions to Forest Law and to associated strategies and policies; mainstreaming guidelines	30% of 22,000 people in 7 communities, 30% of technical officers in the 7 Districts and 20% of technical officers in municipal and central government using Fund-supported tools, instruments, strategies and activities to respond to climate change.	Scorecard approach targeting beneficiary communities and technical officers in districts, municipalities and central government.	Baseline, midterm and end term	PABE	Report	
Output based on project logical framework	1.1. Seven forest management plans revised or developed and put	Number of forest management plans having EbA and climate resilient	The Number of forest management plans revised and /or developed that include EbA	Zero	7 CFMCs at Level 2: CFMC in place, meeting regularly with	7 CFMCs at Level 4: CFMC NR permit system working effectively to enforce	Review of management plans Field visits, Key informant interviews;	Baseline, Midterm and end term	PABE	Report	CFMCs are able to command authority in the development and implementation of the forest

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
	into practice by Community Forest Management Committees, to include EbA and climate-resilient sustainable forest management practices	sustainable forest management practices	and climate resilient sustainable forest management practices		appropriate representation (gender and decision-making authorities)	sustainable natural resource extraction.	household surveys.				management plans.
	1.2. Land reforested to buffer against the impacts of climate change such as floods and soil erosion, and to enhance the provision of non-timber forest products (NTFPs) such as fruits, medicines, nuts, fuelwood and fibre.	Percentage survivorship of planted trees.	Number of trees planted and that survive	Baseline (at time of planting): 100% 3,600 ha	75% of trees planted survive	60% of trees planted survive	Field survey (by local ecologist and/or Forestry Department staff) collecting survivorship data from transects of 50 m by 2 m	Baseline, Midterm and end term	PABE		Community members correctly implement planting of seedlings to ensure survivorship

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
	2.1. Climate resilient agriculture interventions, which increase agricultural yields under climate change conditions, implemented on 3000 hectares		The total areas in ha of farmland where climate smart agriculture technologies have been implemented. The farmland of beneficiaries' small-scale farmers in and out of the community forest	Baseline: (zero)	1000 ha of agricultural lands where climate-resilient agriculture is implemented 500 ha of climate resilient agriculture will be implemented within the community forest while 1000 ha will be under climate smart agriculture (CSA) outside the forest	3,000 ha of agricultural lands where climate-resilient agriculture is implemented. 1000 ha of climate resilient agriculture or climate smart agriculture (CSA) will be implemented within the community forest while 2000 ha will be under climate climate smart agriculture (CSA) outside the forest	GIS based plots surveys of the beneficiary farmers and socio-economic data collection within the community while CSA technologies /practices are upscale within the community	Baseline Midterm and end of project			Communities are open to learning and implementation of the climate resilient agricultural measures

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
		Change in agricultural yields	Percentage change in agricultural yields		Yields increase for 20% of the target population of 22,000 households by 20% through project interventions	Yields increase for 50% of the target population of 22,000 households by 20% through the project interventions.	Randomised sampling; project-level field surveys comprising interviews with local communities				Climate resilient measures are effective in counteracting the effects of weather extremes on agriculture.
	2.2. Market access created for climate resilient crop to support EbA.	The economic value of trade agreements (number and value of trade agreements) facilitating sales from the value chain, which post-harvest facilities are expected to increase/improve.	Total income generated from the NFTP marketed Total number of new tree-based income source	Baseline Survey 0 cooperatives Economic Value to be established during baseline assessments in Year 1. 0	7-14 cooperatives formed and business strategies developed. Economic value created by the project = 0 as work is carried out to strengthen cooperatives and implement Output 2.1	7-14 new trade agreements (1 per cooperative) Economic value created by the project to be established during baseline assessment in year 1.	Random sampling; Project-level field surveys comprising interviews with households and key value chains actors	Baseline Midterm and end of project	ICRAF		Cooperatives fulfil desired production levels.
	Output 3.1 Tools, instruments and strategies	3.1. Degree of integration of climate change and/or		Zero	Level						

		Indicator	Definition of indicator /purpose	Baseline / what is the current value	Target? What is the target value		Data source / how will it be measured	Frequency	Responsible	Reporting format	Assumptions
	developed to enable communities, businesses and the public sector to respond to climate change and variability.	EbA into the Forest Law and agricultural policy (PSDSA)									

Annex 2: Key household physical assets owned by respondents segregated by commune and sex

Physical asset	Sex	Commune							Total
		BANIKOARA	BOU-KOMBE	COBLY	DASSA ZOUMÈ	DJOU-GOU	OUAKE	TCHAOUROU	
Improved roofing sheets	Male	32	48	47	16	66	65	64	338
		43.8%	85.7%	79.7%	29.1%	77.6%	70.7%	78.0%	67.3%
	Female	5	35	21	28	1	4	11	105
		27.8%	87.5%	65.6%	65.1%	25.0%	33.3%	68.8%	63.6%
	Total	37	83	68	44	67	69	75	443
		40.7%	86.5%	74.7%	44.9%	75.3%	66.3%	76.5%	66.4%
Improved Housing	Male	5	24	15	5	63	19	55	186
		6.8%	42.9%	25.4%	9.1%	74.1%	20.7%	67.1%	37.1%
	Female	1	4	6	11	1	2	7	32
		5.6%	10.0%	18.8%	25.6%	25.0%	16.7%	43.8%	19.4%
	Total	6	28	21	16	64	21	62	218
		6.6%	29.2%	23.1%	16.3%	71.9%	20.2%	63.3%	32.7%
Lodging separated from animals	Male	27	35	17	16	58	49	49	251
		37.0%	62.5%	28.8%	29.1%	68.2%	53.3%	59.8%	50.0%
	Female	14	11	28	21	3	8	6	91
		77.8%	27.5%	87.5%	48.8%	75.0%	66.7%	37.5%	55.2%
	Total	60	32	70	60	30	51	39	342
		65.9%	33.3%	76.9%	61.2%	33.7%	49.0%	39.8%	51.3%
Improved storage facility	Male	1	23	7	4	40	23	42	140
		1.4%	41.1%	11.9%	7.3%	47.1%	25.0%	51.2%	27.9%
	Female	0	16	4	10	0	2	4	36
		0.0%	40.0%	12.5%	23.3%	0.0%	16.7%	25.0%	21.8%
	Total	1	39	11	14	40	25	46	176
		1.1%	40.6%	12.1%	14.3%	44.9%	24.0%	46.9%	26.4%

Pipe borne water	Male	1	5	4	4	9	5	3	31
		1.4%	8.9%	6.8%	7.3%	10.6%	5.4%	3.7%	6.2%
	Female	0	1	4	10	0	1	1	17
		0.0%	2.5%	12.5%	23.3%	0.0%	8.3%	6.3%	10.3%
	Total	1	6	8	14	9	6	4	48
		1.1%	6.3%	8.8%	14.3%	10.1%	5.8%	4.1%	7.2%
Irrigation facility	Male	1	5	6	2	9	12	6	41
		1.4%	8.9%	10.2%	3.6%	10.6%	13.0%	7.3%	8.2%
	Female	0	3	7	10	0	2	0	22
		0.0%	7.5%	21.9%	23.3%	0.0%	16.7%	0.0%	13.3%
	Total	1	8	13	12	9	14	6	63
		1.1%	8.3%	14.3%	12.2%	10.1%	13.5%	6.1%	9.4%
Connection to electrical energy	Male	8	2	6	10	29	68	12	135
		11.0%	3.6%	10.2%	18.2%	34.1%	73.9%	14.6%	26.9%
	Female	0	5	1	17	1	4	1	29
		0.0%	12.5%	3.1%	39.5%	25.0%	33.3%	6.3%	17.6%
	Total	8	7	7	27	30	72	13	164
		8.8%	7.3%	7.7%	27.6%	33.7%	69.2%	13.3%	24.6%
Well or bore hole for domestic water	Male	42	27	19	25	27	28	11	179
		57.5%	48.2%	32.2%	45.5%	31.8%	30.4%	13.4%	35.7%
	Female	7	24	11	23	1	2	3	71
		38.9%	60.0%	34.4%	53.5%	25.0%	16.7%	18.8%	43.0%
	Total	49	51	30	48	28	30	14	250
		53.8%	53.1%	33.0%	49.0%	31.5%	28.8%	14.3%	37.5%

Annex 3: Number and percentage of respondent having access to some physical assets for adaptation

		COMMUNE							
		BANIKOARA	BOUKOMBE	COBLY	DASSA ZOUMÈ	DJOUGOU	OUAKE	TCHAOUROU	Total
Improved roofing sheets	Control	16	29	25	23	16	19	27	155
		50.0%	87.9%	96.2%	69.7%	69.6%	57.6%	93.1%	74.2%
	Beneficiary	21	54	43	21	51	50	48	288
		35.6%	85.7%	66.2%	32.3%	77.3%	70.4%	69.6%	62.9%
	Total	37	83	68	44	67	69	75	443
		40.7%	86.5%	74.7%	44.9%	75.3%	66.3%	76.5%	66.4%
Improved Housing	Control	6	0	7	13	16	13	25	80
		18.8%	0.0%	26.9%	39.4%	69.6%	39.4%	86.2%	38.3%
	Beneficiary	0	28	14	3	48	8	37	138
		0.0%	44.4%	21.5%	4.6%	72.7%	11.3%	53.6%	30.1%
	Total	6	28	21	16	64	21	62	218
		6.6%	29.2%	23.1%	16.3%	71.9%	20.2%	63.3%	32.7%
Lodging separated from animals	Control	27	35	17	16	58	49	49	251
		37.0%	62.5%	28.8%	29.1%	68.2%	53.3%	59.8%	50.0%
	Beneficiary	4	29	4	22	1	4	10	74
		22.2%	72.5%	12.5%	51.2%	25.0%	33.3%	62.5%	44.8%
	Total	31	64	21	38	59	53	59	325
		34.1%	66.7%	23.1%	38.8%	66.3%	51.0%	60.2%	48.7%
Improved storage facility	Control	1	12	2	13	11	6	20	65
		3.1%	36.4%	7.7%	39.4%	47.8%	18.2%	69.0%	31.1%
	Beneficiary	0	27	9	1	29	19	26	111
		0.0%	42.9%	13.8%	1.5%	43.9%	26.8%	37.7%	24.2%
	Total	1	39	11	14	40	25	46	176
		1.1%	40.6%	12.1%	14.3%	44.9%	24.0%	46.9%	26.4%

		COMMUNE							
		BANIKOARA	BOUKOMBE	COBLY	DASSA ZOUMÈ	DJOUGOU	OUAKE	TCHAOUROU	Total
Pipe borne water	Control	1	1	1	13	1	3	2	22
		3.1%	3.0%	3.8%	39.4%	4.3%	9.1%	6.9%	10.5%
	Beneficiary	0	5	7	1	8	3	2	26
		0.0%	7.9%	10.8%	1.5%	12.1%	4.2%	2.9%	5.7%
	Total	1	6	8	14	9	6	4	48
		1.1%	6.3%	8.8%	14.3%	10.1%	5.8%	4.1%	7.2%
Irrigation facility	Control	1	3	7	11	0	7	1	30
		3.1%	9.1%	26.9%	33.3%	0.0%	21.2%	3.4%	14.4%
	Beneficiary	0	5	6	1	9	7	5	33
		0.0%	7.9%	9.2%	1.5%	13.6%	9.9%	7.2%	7.2%
	Total	1	8	13	12	9	14	6	63
		1.1%	8.3%	14.3%	12.2%	10.1%	13.5%	6.1%	9.4%
Connection to electrical energy	Control	7	4	1	23	1	23	2	61
		21.9%	12.1%	3.8%	69.7%	4.3%	69.7%	6.9%	29.2%
	Beneficiary	1	3	6	4	29	49	11	103
		1.7%	4.8%	9.2%	6.2%	43.9%	69.0%	15.9%	22.5%
	Total	8	7	7	27	30	72	13	164
		8.8%	7.3%	7.7%	27.6%	33.7%	69.2%	13.3%	24.6%
Well or bore hole for domestic water	Control	3	12	8	14	8	15	8	68
		9.4%	36.4%	30.8%	42.4%	34.8%	45.5%	27.6%	32.5%
	Beneficiary	0	7	31	9	47	53	36	183
		0.0%	11.1%	47.7%	13.8%	71.2%	74.6%	52.2%	40.0%
	Total	3	19	39	23	55	68	44	251
		3.3%	19.8%	42.9%	23.5%	61.8%	65.4%	44.9%	37.6%

Annex 4: Yields of major food crops as of 2021

Communes	Area (Ha)	Yield (Kg/Ha)	Prod (T)	Area (Ha)	Yield (Kg/Ha)	Prod (T)	Area (Ha)	Yield (Kg/Ha)	Prod (T)	Area (Ha)	Yield (Kg/Ha)	Prod (T)	Area (Ha)	Yield (Kg/Ha)	Prod (T)
Roots and tubers	**cassava**			**yams**			**Sweet potatoes**			**Irish potatoes**			**Taro**		
Tchaourou	6,658	11,185	74,470	31,450	16,375	514,994	68	6,867	467						
Banikoara	205	11,814	2,426	507	9,397	4,765	213	5,326	1,133						
Boukombe	713	8,598	6,134	1,029	12,098	12,453	256	6,261	1,601	31	10,071	310	103	4518	465
Cobly	431	8,782	3,786	2,254	11,996	27,044	44	4,762	208						
Djougou	3,109	12,639	39,294	7,914	15,350	121,477	107	4,884	522	11	2,036	23	3	3184	9
Ouake	1,104	14,791	16,332	1,994	17,179	34,263	59	6,021	354						
DassaZoumè	4,845	14,606	70,768	2,941	11,572	34,033	58	2,999	175						
Cereale	**Maize**			**Rice**			**Millet**			**Sorgho**					
Djougou	15,741	1415	22,272	3,920	2,567	10,064	1,044	596	623	6,877	1,059	7,284			
Ouake	3,540	1145	4,053	1,972	3,228	6,366	978	824	806	2,573	1,059	2,726			
Banikoara	55,836	924	51,620	7,665	3,466	26,568	398	980	390	25,155	1,059	26,643			
Boukombe	8,998	1361	12,243	3,300	3,730	12,310	2,419	631	1,528	5,978	1,059	6,331			
Cobly	9,013	1176	10,601	1,985	3,030	6,016	1,000	1,290	1,290	3,571	1,059	3,783			
DassaZoumè	22707	768	17,445	5,084	3,550	18,051				889	1,059	941			
Tchaourou	12,678	1,422	18,024	580	3,653	2,120	28	902	25	1,681	1,059	1,781			
Legumineuses et oleagineuses	**Niebe**			**Groundnuts**			**Soja**			**Goussi**					
Tchaourou	1,790	872	1,561	1,781	1,124	2,001	4,310	1,102	4,750	442	1,372	607			
Banikoara	3,354	1,100	3,690	3,368	1,134	3,818	4,532	1,383	6,265	2	541	1			
Boukombe	2,558	1,191	3,046	716	1,456	1,042	1,985	1,709	3,393	89	532	48			
Cobly	1,608	1,001	1,609	606	1,493	906	4,979	2,352	11,709	46	765	35			
Djougou	3,688	1,192	4,397	2,896	1,404	4,067	3,267	1,725	5,636	384	809	311			
Ouake	1,707	906	1,546	2,067	1,020	2,108	1,343	1,500	2,015	254	589	150			
DassaZoumè	5,777	843	4,867	6,146	853	5,244	10,560	925	9,739	103	516	53			

Source : Ministère de l'Agriculture de l'Elevage et de la Pèche (MAEP), Direction de la Statistique Agricole. 2022

Annex 5: Access to community utilities segregated by group and municipality

Group	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
Control	BANIKOARA	0	0	5	3	0	0	29	0	1	14
		0.0%	0.0%	15.6%	9.4%	0.0%	0.0%	90.6%	0.0%	4.2%	58.3%
	BOUKOMBE	1	3	11	29	4	1	5	1	0	2
		3.0%	9.1%	33.3%	87.9%	12.1%	3.0%	15.2%	3.0%	0.0%	6.5%
	COBLY	0	0	7	12	3	0	17	1	2	2
		0.0%	0.0%	28.0%	48.0%	12.0%	0.0%	68.0%	4.0%	8.7%	13.3%
	DASSA ZOUME	5	7	7	7	5	5	28	5	5	7
		13.2%	18.4%	18.4%	18.4%	13.2%	13.2%	73.7%	13.2%	16.1%	22.6%
	DJOUGOU	0	0	3	12	2	0	21	1	0	0
		0.0%	0.0%	13.0%	52.2%	8.7%	0.0%	91.3%	4.3%	0.0%	0.0%
	OUAKE	0	4	6	12	1	1	11	0	4	0
		0.0%	13.8%	20.7%	41.4%	3.4%	3.4%	37.9%	0.0%	13.8%	0.0%
	TCHAOUROU	1	0	10	11	0	0	26	0	0	0
		3.6%	0.0%	35.7%	39.3%	0.0%	0.0%	92.9%	0.0%	0.0%	0.0%
Total		7	14	49	86	15	7	137	8	12	25
		3.4%	6.7%	23.6%	41.3%	7.2%	3.4%	65.9%	3.8%	6.3%	13.8%
Beneficiary	BANIKOARA	0	0	1	2	0	0	53	3	11	32

Group	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
		0.0%	0.0%	1.5%	3.0%	0.0%	0.0%	80.3%	4.5%	16.7%	48.5%
	BOUKOMBE	6	9	15	31	8	8	23	10	13	5
		9.7%	14.5%	24.2%	50.0%	12.9%	12.9%	37.1%	16.1%	21.7%	10.6%
	COBLY	0	10	4	27	2	0	34	3	0	1
		0.0%	15.6%	6.3%	42.2%	3.1%	0.0%	53.1%	4.7%	0.0%	1.7%
	DASSA ZOUME	9	14	12	28	16	10	39	6	4	2
		14.1%	21.9%	18.8%	43.8%	25.0%	15.6%	60.9%	9.4%	11.1%	5.6%
	DJOUGOU	0	0	12	44	2	0	51	1	11	2
		0.0%	0.0%	18.5%	67.7%	3.1%	0.0%	78.5%	1.5%	17.2%	3.1%
	OUAKE	0	2	16	30	1	3	19	0	20	0
		0.0%	2.9%	23.2%	43.5%	1.4%	4.3%	27.5%	0.0%	29.0%	0.0%
	TCHAOUROU	1	0	7	34	1	0	60	0	3	0
		1.4%	0.0%	10.1%	49.3%	1.4%	0.0%	87.0%	0.0%	4.8%	0.0%
Total		16	35	67	196	30	21	279	23	62	42
		3.5%	7.6%	14.6%	42.7%	6.5%	4.6%	60.8%	5.0%	14.8%	11.1%
Total	BANIKOARA	0	0	6	5	0	0	82	3	12	46
		0.0%	0.0%	6.1%	5.1%	0.0%	0.0%	83.7%	3.1%	13.3%	51.1%
	BOUKOMBE	7	12	26	60	12	9	28	11	13	7

Group	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
		7.4%	12.6%	27.4%	63.2%	12.6%	9.5%	29.5%	11.6%	14.3%	9.0%
	COBLY	0	10	11	39	5	0	51	4	2	3
		0.0%	11.2%	12.4%	43.8%	5.6%	0.0%	57.3%	4.5%	2.4%	4.1%
	DASSA ZOUME	14	21	19	35	21	15	67	11	9	9
		13.7%	20.6%	18.6%	34.3%	20.6%	14.7%	65.7%	10.8%	13.4%	13.4%
	DJOUGOU	0	0	15	56	4	0	72	2	11	2
		0.0%	0.0%	17.0%	63.6%	4.5%	0.0%	81.8%	2.3%	12.6%	2.3%
	OUAKE	0	6	22	42	2	4	30	0	24	0
		0.0%	6.1%	22.4%	42.9%	2.0%	4.1%	30.6%	0.0%	24.5%	0.0%
	TCHAOUROU	2	0	17	45	1	0	86	0	3	0
		2.1%	0.0%	17.5%	46.4%	1.0%	0.0%	88.7%	0.0%	3.3%	0.0%
Total		23	49	116	282	45	28	416	31	74	67
		3.4%	7.3%	17.4%	42.3%	6.7%	4.2%	62.4%	4.6%	12.2%	11.9%

Annex 6: Access to community utilities segregated by sex and municipality

Sex	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
Male	BANIKOARA	0	0	4	4	0	0	55	2	8	28
		0.0%	0.0%	6.2%	6.2%	0.0%	0.0%	84.6%	3.1%	13.3%	46.7%
	BOUKOMBE	5	8	18	36	9	5	20	8	6	3
		9.1%	14.5%	32.7%	65.5%	16.4%	9.1%	36.4%	14.5%	11.3%	7.0%
	COBLY	0	7	8	32	5	0	39	4	2	3
		0.0%	10.1%	11.6%	46.4%	7.2%	0.0%	56.5%	5.8%	3.0%	5.1%
	DASSA ZOUME	10	17	12	28	16	10	49	10	6	5
		13.5%	23.0%	16.2%	37.8%	21.6%	13.5%	66.2%	13.5%	12.2%	10.2%
	DJOUGOU	0	0	15	52	4	0	66	2	7	2
		0.0%	0.0%	19.2%	66.7%	5.1%	0.0%	84.6%	2.6%	9.1%	2.6%
	OUAKE	0	3	17	36	2	4	25	0	19	0
		0.0%	3.8%	21.5%	45.6%	2.5%	5.1%	31.6%	0.0%	24.1%	0.0%
	TCHAOUROU	2	0	17	34	1	0	73	0	3	0
		2.4%	0.0%	20.7%	41.5%	1.2%	0.0%	89.0%	0.0%	3.9%	0.0%
Total		17	35	91	222	37	19	327	26	51	41
		3.4%	7.0%	18.1%	44.2%	7.4%	3.8%	65.1%	5.2%	11.1%	9.7%
Female	BANIKOARA	0	0	2	1	0	0	27	1	4	18

Sex	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
		0.0%	0.0%	6.1%	3.0%	0.0%	0.0%	81.8%	3.0%	13.3%	60.0%
	BOUKOMBE	2	4	8	24	3	4	8	3	7	4
		5.0%	10.0%	20.0%	60.0%	7.5%	10.0%	20.0%	7.5%	18.4%	11.4%
	COBLY	0	3	3	7	0	0	12	0	0	0
		0.0%	15.0%	15.0%	35.0%	0.0%	0.0%	60.0%	0.0%	0.0%	0.0%
	DASSA ZOUME	4	4	7	7	5	5	18	1	3	4
		14.3%	14.3%	25.0%	25.0%	17.9%	17.9%	64.3%	3.6%	16.7%	22.2%
	DJOUGOU	0	0	0	4	0	0	6	0	4	0
		0.0%	0.0%	0.0%	40.0%	0.0%	0.0%	60.0%	0.0%	40.0%	0.0%
	OUAKE	0	3	5	6	0	0	5	0	5	0
		0.0%	15.8%	26.3%	31.6%	0.0%	0.0%	26.3%	0.0%	26.3%	0.0%
	TCHAOUROU	0	0	0	11	0	0	13	0	0	0
		0.0%	0.0%	0.0%	73.3%	0.0%	0.0%	86.7%	0.0%	0.0%	0.0%
Total		6	14	25	60	8	9	89	5	23	26
		3.6%	8.5%	15.2%	36.4%	4.8%	5.5%	53.9%	3.0%	15.6%	18.7%
Total	BANIKOARA	0	0	6	5	0	0	82	3	12	46
		0.0%	0.0%	6.1%	5.1%	0.0%	0.0%	83.7%	3.1%	13.3%	51.1%
	BOUKOMBE	7	12	26	60	12	9	28	11	13	7

Sex	Councils	Irrigation	Infrastructure reservoirs for water collection	Dams or water ponds	Boreholes	Solar water pumps	Wind-powered water pumps	Water pumps (other type such as hand pumps)	Inlet pipe Water connection source	None	Others
		7.4%	12.6%	27.4%	63.2%	12.6%	9.5%	29.5%	11.6%	14.3%	9.0%
	COBLY	0	10	11	39	5	0	51	4	2	3
		0.0%	11.2%	12.4%	43.8%	5.6%	0.0%	57.3%	4.5%	2.4%	4.1%
	DASSA ZOUME	14	21	19	35	21	15	67	11	9	9
		13.7%	20.6%	18.6%	34.3%	20.6%	14.7%	65.7%	10.8%	13.4%	13.4%
	DJOUGOU	0	0	15	56	4	0	72	2	11	2
		0.0%	0.0%	17.0%	63.6%	4.5%	0.0%	81.8%	2.3%	12.6%	2.3%
	OUAKE	0	6	22	42	2	4	30	0	24	0
		0.0%	6.1%	22.4%	42.9%	2.0%	4.1%	30.6%	0.0%	24.5%	0.0%
	TCHAOUROU	2	0	17	45	1	0	86	0	3	0
		2.1%	0.0%	17.5%	46.4%	1.0%	0.0%	88.7%	0.0%	3.3%	0.0%
Total		23	49	116	282	45	28	416	31	74	67
		3.4%	7.3%	17.4%	42.3%	6.7%	4.2%	62.4%	4.6%	12.2%	11.9%

Annex 7: Nature of land before farmer started using it segregated by group and municipality

Group	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
Control	BANIKOARA	1	18	0	7	6	0
		3.1%	56.3%	0.0%	21.9%	18.8%	0.0%
	BOUKOMBE	0	19	0	1	6	7
		0.0%	57.6%	0.0%	3.0%	18.2%	21.2%
	COBLY	0	4	0	2	18	1
		0.0%	16.0%	0.0%	8.0%	72.0%	4.0%
	DASSA ZOUME	0	26	0	0	11	1
		0.0%	68.4%	0.0%	0.0%	28.9%	2.6%
	DJOUGOU	0	1	0	8	14	0
		0.0%	4.3%	0.0%	34.8%	60.9%	0.0%
	OUAKE	0	4	3	5	10	7
		0.0%	13.8%	10.3%	17.2%	34.5%	24.1%
	TCHAOUROU	0	5	0	0	23	0
		0.0%	17.9%	0.0%	0.0%	82.1%	0.0%
Total		1	77	3	23	88	16
		.5%	37.0%	1.4%	11.1%	42.3%	7.7%
Beneficiary	BANIKOARA	0	33	0	29	4	0
		0.0%	50.0%	0.0%	43.9%	6.1%	0.0%
	BOUKOMBE	13	21	3	0	11	14
		21.0%	33.9%	4.8%	0.0%	17.7%	22.6%

Group	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
	COBLY	20	20	2	1	20	1
		31.3%	31.3%	3.1%	1.6%	31.3%	1.6%
	DASSA ZOUME	0	45	0	6	10	3
		0.0%	70.3%	0.0%	9.4%	15.6%	4.7%
	DJOUGOU	0	13	6	19	27	0
		0.0%	20.0%	9.2%	29.2%	41.5%	0.0%
	OUAKE	6	9	2	28	17	7
		8.7%	13.0%	2.9%	40.6%	24.6%	10.1%
	TCHAOUROU	0	27	0	0	37	5
		0.0%	39.1%	0.0%	0.0%	53.6%	7.2%
Total		39	168	13	83	126	30
		8.5%	36.6%	2.8%	18.1%	27.5%	6.5%
Total	BANIKOARA	1	51	0	36	10	0
		1.0%	52.0%	0.0%	36.7%	10.2%	0.0%
	BOUKOMBE	13	40	3	1	17	21
		13.7%	42.1%	3.2%	1.1%	17.9%	22.1%
	COBLY	20	24	2	3	38	2
		22.5%	27.0%	2.2%	3.4%	42.7%	2.2%
	DASSA ZOUME	0	71	0	6	21	4
		0.0%	69.6%	0.0%	5.9%	20.6%	3.9%

Group	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
	DJOUGOU	0	14	6	27	41	0
		0.0%	15.9%	6.8%	30.7%	46.6%	0.0%
	OUAKE	6	13	5	33	27	14
		6.1%	13.3%	5.1%	33.7%	27.6%	14.3%
	TCHAOUROU	0	32	0	0	60	5
		0.0%	33.0%	0.0%	0.0%	61.9%	5.2%
Total		40	245	16	106	214	46
		6.0%	36.7%	2.4%	15.9%	32.1%	6.9%

Annex 8: Nature of land before farmer started using it segregated by sex and municipality

Sex	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
Male	BANIKOARA	1	35	0	24	5	0
		1.5%	53.8%	0.0%	36.9%	7.7%	0.0%
	BOUKOMBE	9	22	3	1	8	12
		16.4%	40.0%	5.5%	1.8%	14.5%	21.8%
	COBLY	14	18	2	3	30	2
		20.3%	26.1%	2.9%	4.3%	43.5%	2.9%
	DASSA ZOUME	0	52	0	4	15	3
		0.0%	70.3%	0.0%	5.4%	20.3%	4.1%
	DJOUGOU	0	14	3	21	40	0
		0.0%	17.9%	3.8%	26.9%	51.3%	0.0%
	OUAKE	5	10	3	30	21	10
		6.3%	12.7%	3.8%	38.0%	26.6%	12.7%
	TCHAOUROU	0	24	0	0	54	4
		0.0%	29.3%	0.0%	0.0%	65.9%	4.9%
Total		29	175	11	83	173	31
		5.8%	34.9%	2.2%	16.5%	34.5%	6.2%
Female	BANIKOARA	0	16	0	12	5	0
		0.0%	48.5%	0.0%	36.4%	15.2%	0.0%
	BOUKOMBE	4	18	0	0	9	9

Sex	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
		10.0%	45.0%	0.0%	0.0%	22.5%	22.5%
	COBLY	6	6	0	0	8	0
		30.0%	30.0%	0.0%	0.0%	40.0%	0.0%
	DASSA ZOUME	0	19	0	2	6	1
		0.0%	67.9%	0.0%	7.1%	21.4%	3.6%
	DJOUGOU	0	0	3	6	1	0
		0.0%	0.0%	30.0%	60.0%	10.0%	0.0%
	OUAKE	1	3	2	3	6	4
		5.3%	15.8%	10.5%	15.8%	31.6%	21.1%
	TCHAOUROU	0	8	0	0	6	1
		0.0%	53.3%	0.0%	0.0%	40.0%	6.7%
Total		11	70	5	23	41	15
		6.7%	42.4%	3.0%	13.9%	24.8%	9.1%
Total	BANIKOARA	1	51	0	36	10	0
		1.0%	52.0%	0.0%	36.7%	10.2%	0.0%
	BOUKOMBE	13	40	3	1	17	21
		13.7%	42.1%	3.2%	1.1%	17.9%	22.1%
	COBLY	20	24	2	3	38	2
		22.5%	27.0%	2.2%	3.4%	42.7%	2.2%
	DASSA ZOUME	0	71	0	6	21	4

Sex	Councils	Open pasture	Wooded area	Livestock area	Crop area	Forest area	Residential area
	DJOUGOU	0.0%	69.6%	0.0%	5.9%	20.6%	3.9%
		0	14	6	27	41	0
		0.0%	15.9%	6.8%	30.7%	46.6%	0.0%
	OUAKE	6	13	5	33	27	14
		6.1%	13.3%	5.1%	33.7%	27.6%	14.3%
	TCHAOUROU	0	32	0	0	60	5
		0.0%	33.0%	0.0%	0.0%	61.9%	5.2%
Total		40	245	16	106	214	46
		6.0%	36.7%	2.4%	15.9%	32.1%	6.9%

Annex 9 :Number and percentage of trees planted by individual households in the last 12 month segregated by group and municipality

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
Control	BANIKOARA	22	7	1	1	1
		68.8%	21.9%	3.1%	3.1%	3.1%
	BOUKOMBE	18	13	1	0	1
		54.5%	39.4%	3.0%	0.0%	3.0%
	COBLY	7	9	3	5	1
		28.0%	36.0%	12.0%	20.0%	4.0%
	DASSA ZOUME	25	5	2	5	1
		65.8%	13.2%	5.3%	13.2%	2.6%
	DJOUGOU	6	8	2	1	6
		26.1%	34.8%	8.7%	4.3%	26.1%
	OUAKE	14	4	4	4	3
		48.3%	13.8%	13.8%	13.8%	10.3%
	TCHAOUROU	3	11	6	5	3
		10.7%	39.3%	21.4%	17.9%	10.7%
Total		95	57	19	21	16
		45.7%	27.4%	9.1%	10.1%	7.7%
Beneficiary	BANIKOARA	56	7	2	1	0
		84.8%	10.6%	3.0%	1.5%	0.0%
	BOUKOMBE	21	30	1	9	1
		33.9%	48.4%	1.6%	14.5%	1.6%

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	COBLY	24	26	7	6	1
		37.5%	40.6%	10.9%	9.4%	1.6%
	DASSA ZOUME	29	21	9	4	1
		45.3%	32.8%	14.1%	6.3%	1.6%
	DJOUGOU	20	14	11	10	10
		30.8%	21.5%	16.9%	15.4%	15.4%
	OUAKE	30	18	13	7	1
		43.5%	26.1%	18.8%	10.1%	1.4%
	TCHAOUROU	10	21	13	10	15
		14.5%	30.4%	18.8%	14.5%	21.7%
Total		190	137	56	47	29
		41.4%	29.8%	12.2%	10.2%	6.3%
Total	BANIKOARA	78	14	3	2	1
		79.6%	14.3%	3.1%	2.0%	1.0%
	BOUKOMBE	39	43	2	9	2
		41.1%	45.3%	2.1%	9.5%	2.1%
	COBLY	31	35	10	11	2
		34.8%	39.3%	11.2%	12.4%	2.2%
	DASSA ZOUME	54	26	11	9	2
		52.9%	25.5%	10.8%	8.8%	2.0%

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	DJOUGOU	26	22	13	11	16
		29.5%	25.0%	14.8%	12.5%	18.2%
	OUAKE	44	22	17	11	4
		44.9%	22.4%	17.3%	11.2%	4.1%
	TCHAOUROU	13	32	19	15	18
		13.4%	33.0%	19.6%	15.5%	18.6%
Total		285	194	75	68	45
		42.7%	29.1%	11.2%	10.2%	6.7%

Annex 10: Number and percentage of trees planted by individual households in the last 12 months segregated by sex and municipality

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
Male	BANIKOARA	52	11	1	1	0
		80.0%	16.9%	1.5%	1.5%	0.0%
	BOUKOMBE	17	28	1	7	2
		30.9%	50.9%	1.8%	12.7%	3.6%
	COBLY	21	29	8	9	2
		30.4%	42.0%	11.6%	13.0%	2.9%
	DASSA ZOUME	40	18	8	6	2
		54.1%	24.3%	10.8%	8.1%	2.7%
	DJOUGOU	23	21	13	8	13
		29.5%	26.9%	16.7%	10.3%	16.7%
	OUAKE	31	17	17	10	4
		39.2%	21.5%	21.5%	12.7%	5.1%
	TCHAOUROU	9	28	17	14	14
		11.0%	34.1%	20.7%	17.1%	17.1%
Total		193	152	65	55	37
		38.4%	30.3%	12.9%	11.0%	7.4%
Female	BANIKOARA	26	3	2	1	1
		78.8%	9.1%	6.1%	3.0%	3.0%
	BOUKOMBE	22	15	1	2	0
		55.0%	37.5%	2.5%	5.0%	0.0%

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	COBLY	10	6	2	2	0
		50.0%	30.0%	10.0%	10.0%	0.0%
	DASSA ZOUME	14	8	3	3	0
		50.0%	28.6%	10.7%	10.7%	0.0%
	DJOUGOU	3	1	0	3	3
		30.0%	10.0%	0.0%	30.0%	30.0%
	OUAKE	13	5	0	1	0
		68.4%	26.3%	0.0%	5.3%	0.0%
	TCHAOUROU	4	4	2	1	4
		26.7%	26.7%	13.3%	6.7%	26.7%
Total		92	42	10	13	8
		55.8%	25.5%	6.1%	7.9%	4.8%
Total	BANIKOARA	78	14	3	2	1
		79.6%	14.3%	3.1%	2.0%	1.0%
	BOUKOMBE	39	43	2	9	2
		41.1%	45.3%	2.1%	9.5%	2.1%
	COBLY	31	35	10	11	2
		34.8%	39.3%	11.2%	12.4%	2.2%
	DASSA ZOUME	54	26	11	9	2
		52.9%	25.5%	10.8%	8.8%	2.0%
	DJOUGOU	26	22	13	11	16

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	OUAKE	29.5%	25.0%	14.8%	12.5%	18.2%
		44	22	17	11	4
		44.9%	22.4%	17.3%	11.2%	4.1%
	TCHAOUROU	13	32	19	15	18
		13.4%	33.0%	19.6%	15.5%	18.6%
Total		285	194	75	68	45
		42.7%	29.1%	11.2%	10.2%	6.7%

Annex 11: Number and percentage of trees deliberately protected by individual households in the last 12 months segregated by group and municipality

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
Control	BANIKOARA	8	23	0	1	0
		25.0%	71.9%	0.0%	3.1%	0.0%
	BOUKOMBE	13	17	2	0	1
		39.4%	51.5%	6.1%	0.0%	3.0%
	COBLY	2	14	6	0	3
		8.0%	56.0%	24.0%	0.0%	12.0%
	DASSA ZOUME	16	19	2	0	1
		42.1%	50.0%	5.3%	0.0%	2.6%
	DJOUGOU	2	9	2	3	7
		8.7%	39.1%	8.7%	13.0%	30.4%
	OUAKE	10	2	7	7	3
		34.5%	6.9%	24.1%	24.1%	10.3%
	TCHAOUROU	6	12	4	1	5
		21.4%	42.9%	14.3%	3.6%	17.9%
Total		57	96	23	12	20
		27.4%	46.2%	11.1%	5.8%	9.6%
Beneficiary	BANIKOARA	26	39	1	0	0
		39.4%	59.1%	1.5%	0.0%	0.0%
	BOUKOMBE	12	36	5	8	1

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
		19.4%	58.1%	8.1%	12.9%	1.6%
	COBLY	18	33	2	6	5
		28.1%	51.6%	3.1%	9.4%	7.8%
	DASSA ZOUME	16	31	12	1	4
		25.0%	48.4%	18.8%	1.6%	6.3%
	DJOUGOU	10	15	13	14	13
		15.4%	23.1%	20.0%	21.5%	20.0%
	OUAKE	14	26	14	7	8
		20.3%	37.7%	20.3%	10.1%	11.6%
	TCHAOUROU	6	25	12	16	10
		8.7%	36.2%	17.4%	23.2%	14.5%
Total		102	205	59	52	41
		22.2%	44.7%	12.9%	11.3%	8.9%
Total	BANIKOARA	34	62	1	1	0
		34.7%	63.3%	1.0%	1.0%	0.0%
	BOUKOMBE	25	53	7	8	2
		26.3%	55.8%	7.4%	8.4%	2.1%
	COBLY	20	47	8	6	8
		22.5%	52.8%	9.0%	6.7%	9.0%
	DASSA ZOUME	32	50	14	1	5
		31.4%	49.0%	13.7%	1.0%	4.9%

Group	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	DJOUGOU	12	24	15	17	20
		13.6%	27.3%	17.0%	19.3%	22.7%
	OUAKE	24	28	21	14	11
		24.5%	28.6%	21.4%	14.3%	11.2%
	TCHAOUROU	12	37	16	17	15
		12.4%	38.1%	16.5%	17.5%	15.5%
Total		159	301	82	64	61
		23.8%	45.1%	12.3%	9.6%	9.1%

Annex 12: Number and percentage of trees deliberately protected by individual households in the last 12 months segregated by sex and municipality

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
Male	BANIKOARA	23	41	1	0	0
		35.4%	63.1%	1.5%	0.0%	0.0%
	BOUKOMBE	10	35	4	5	1
		18.2%	63.6%	7.3%	9.1%	1.8%
	COBLY	14	38	5	4	8
		20.3%	55.1%	7.2%	5.8%	11.6%
	DASSA ZOUME	19	38	12	1	4
		25.7%	51.4%	16.2%	1.4%	5.4%
	DJOUGOU	10	24	15	13	16
		12.8%	30.8%	19.2%	16.7%	20.5%
	OUAKE	17	24	19	9	10
		21.5%	30.4%	24.1%	11.4%	12.7%
	TCHAOUROU	10	31	13	16	12
		12.2%	37.8%	15.9%	19.5%	14.6%
Total		103	231	69	48	51
		20.5%	46.0%	13.7%	9.6%	10.2%
Female	BANIKOARA	11	21	0	1	0
		33.3%	63.6%	0.0%	3.0%	0.0%
	BOUKOMBE	15	18	3	3	1
		37.5%	45.0%	7.5%	7.5%	2.5%

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
	COBLY	6	9	3	2	0
		30.0%	45.0%	15.0%	10.0%	0.0%
	DASSA ZOUME	13	12	2	0	1
		46.4%	42.9%	7.1%	0.0%	3.6%
	DJOUGOU	2	0	0	4	4
		20.0%	0.0%	0.0%	40.0%	40.0%
	OUAKE	7	4	2	5	1
		36.8%	21.1%	10.5%	26.3%	5.3%
	TCHAOUROU	2	6	3	1	3
		13.3%	40.0%	20.0%	6.7%	20.0%
Total		56	70	13	16	10
		33.9%	42.4%	7.9%	9.7%	6.1%
Total	BANIKOARA	34	62	1	1	0
		34.7%	63.3%	1.0%	1.0%	0.0%
	BOUKOMBE	25	53	7	8	2
		26.3%	55.8%	7.4%	8.4%	2.1%
	COBLY	20	47	8	6	8
		22.5%	52.8%	9.0%	6.7%	9.0%
	DASSA ZOUME	32	50	14	1	5
		31.4%	49.0%	13.7%	1.0%	4.9%
	DJOUGOU	12	24	15	17	20

Sex	Councils	None	Less than 10	11 to 50	51 to 100	More than 100
		13.6%	27.3%	17.0%	19.3%	22.7%
	OUAKE	24	28	21	14	11
		24.5%	28.6%	21.4%	14.3%	11.2%
	TCHAOUROU	12	37	16	17	15
		12.4%	38.1%	16.5%	17.5%	15.5%
Total		159	301	82	64	61
		23.8%	45.1%	12.3%	9.6%	9.1%

Annex 13: Reasons for protecting trees segregated by segregated by group and municipality

Group	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
Control	BANIKOARA	15	0	8	11	1	0	9	10	3
		46.9%	0.0%	25.0%	34.4%	3.1%	0.0%	28.1%	31.3%	12.5%
	BOUKOMBE	22	0	7	16	0	1	8	1	9
		66.7%	0.0%	21.2%	48.5%	0.0%	3.0%	24.2%	3.0%	29.0%
	COBLY	20	0	8	15	7	0	12	3	2
		80.0%	0.0%	32.0%	60.0%	28.0%	0.0%	48.0%	12.0%	8.7%
	DASSA ZOUME	14	0	12	13	2	1	11	9	11
		36.8%	0.0%	31.6%	34.2%	5.3%	2.6%	28.9%	23.7%	35.5%
	DJOUGOU	21	0	6	9	4	0	13	1	2
		91.3%	0.0%	26.1%	39.1%	17.4%	0.0%	56.5%	4.3%	8.7%
	OUAKE	14	1	12	11	5	5	17	1	9
		48.3%	3.4%	41.4%	37.9%	17.2%	17.2%	58.6%	3.4%	31.0%
	TCHAOUROU	20	0	8	11	3	11	13	2	2
		71.4%	0.0%	28.6%	39.3%	10.7%	39.3%	46.4%	7.1%	7.1%
Total		126	1	61	86	22	18	83	27	38
		60.6%	.5%	29.3%	41.3%	10.6%	8.7%	39.9%	13.0%	20.1%
Beneficiary	BANIKOARA	28	0	29	35	2	0	15	20	12
		42.4%	0.0%	43.9%	53.0%	3.0%	0.0%	22.7%	30.3%	18.2%
	BOUKOMBE	49	9	37	34	20	13	41	8	16

Group	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
		79.0%	14.5%	59.7%	54.8%	32.3%	21.0%	66.1%	12.9%	26.7%
	COBLY	51	3	28	30	24	3	49	3	7
		79.7%	4.7%	43.8%	46.9%	37.5%	4.7%	76.6%	4.7%	11.5%
	DASSA ZOUME	45	2	9	32	4	4	23	12	2
		70.3%	3.1%	14.1%	50.0%	6.3%	6.3%	35.9%	18.8%	5.6%
	DJOUGOU	42	0	16	25	6	12	19	5	5
		64.6%	0.0%	24.6%	38.5%	9.2%	18.5%	29.2%	7.7%	7.8%
	OUAKE	56	1	28	35	21	6	43	12	6
		81.2%	1.4%	40.6%	50.7%	30.4%	8.7%	62.3%	17.4%	8.7%
	TCHAOUROU	50	0	16	26	4	11	28	13	2
		72.5%	0.0%	23.2%	37.7%	5.8%	15.9%	40.6%	18.8%	3.2%
Total		321	15	163	217	81	49	218	73	50
		69.9%	3.3%	35.5%	47.3%	17.6%	10.7%	47.5%	15.9%	11.9%
Total	BANIKOARA	43	0	37	46	3	0	24	30	15
		43.9%	0.0%	37.8%	46.9%	3.1%	0.0%	24.5%	30.6%	16.7%
	BOUKOMBE	71	9	44	50	20	14	49	9	25
		74.7%	9.5%	46.3%	52.6%	21.1%	14.7%	51.6%	9.5%	27.5%
	COBLY	71	3	36	45	31	3	61	6	9
		79.8%	3.4%	40.4%	50.6%	34.8%	3.4%	68.5%	6.7%	10.7%
	DASSA ZOUME	59	2	21	45	6	5	34	21	13

Group	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
		57.8%	2.0%	20.6%	44.1%	5.9%	4.9%	33.3%	20.6%	19.4%
	DJOUGOU	63	0	22	34	10	12	32	6	7
		71.6%	0.0%	25.0%	38.6%	11.4%	13.6%	36.4%	6.8%	8.0%
	OUAKE	70	2	40	46	26	11	60	13	15
		71.4%	2.0%	40.8%	46.9%	26.5%	11.2%	61.2%	13.3%	15.3%
	TCHAOUROU	70	0	24	37	7	22	41	15	4
		72.2%	0.0%	24.7%	38.1%	7.2%	22.7%	42.3%	15.5%	4.4%
Total		447	16	224	303	103	67	301	100	88
		67.0%	2.4%	33.6%	45.4%	15.4%	10.0%	45.1%	15.0%	14.5%

Annex 14: Reasons for protecting trees segregated by segregated by sex and municipality

Sex	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
Male	BANIKOARA	31	0	24	28	2	0	14	20	12
		47.7%	0.0%	36.9%	43.1%	3.1%	0.0%	21.5%	30.8%	20.0%
	BOUKOMBE	42	5	28	29	13	9	29	6	11
		76.4%	9.1%	50.9%	52.7%	23.6%	16.4%	52.7%	10.9%	20.8%
	COBLY	55	1	24	36	22	1	48	4	7
		79.7%	1.4%	34.8%	52.2%	31.9%	1.4%	69.6%	5.8%	10.4%
	DASSA ZOUME	43	2	15	33	5	4	26	17	7
		58.1%	2.7%	20.3%	44.6%	6.8%	5.4%	35.1%	23.0%	14.3%
	DJOUGOU	57	0	21	33	8	12	30	3	6
		73.1%	0.0%	26.9%	42.3%	10.3%	15.4%	38.5%	3.8%	7.8%
	OUAKE	58	2	32	38	23	10	54	9	11
		73.4%	2.5%	40.5%	48.1%	29.1%	12.7%	68.4%	11.4%	13.9%
	TCHAOUROU	58	0	19	31	7	20	34	13	3
		70.7%	0.0%	23.2%	37.8%	8.5%	24.4%	41.5%	15.9%	3.9%
Total		344	10	163	228	80	56	235	72	57
		68.5%	2.0%	32.5%	45.4%	15.9%	11.2%	46.8%	14.3%	12.4%
Female	BANIKOARA	12	0	13	18	1	0	10	10	3
		36.4%	0.0%	39.4%	54.5%	3.0%	0.0%	30.3%	30.3%	10.0%
	BOUKOMBE	29	4	16	21	7	5	20	3	14

Sex	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
		72.5%	10.0%	40.0%	52.5%	17.5%	12.5%	50.0%	7.5%	36.8%
	COBLY	16	2	12	9	9	2	13	2	2
		80.0%	10.0%	60.0%	45.0%	45.0%	10.0%	65.0%	10.0%	11.8%
	DASSA ZOUME	16	0	6	12	1	1	8	4	6
		57.1%	0.0%	21.4%	42.9%	3.6%	3.6%	28.6%	14.3%	33.3%
	DJOUGOU	6	0	1	1	2	0	2	3	1
		60.0%	0.0%	10.0%	10.0%	20.0%	0.0%	20.0%	30.0%	10.0%
	OUAKE	12	0	8	8	3	1	6	4	4
		63.2%	0.0%	42.1%	42.1%	15.8%	5.3%	31.6%	21.1%	21.1%
	TCHAOUROU	12	0	5	6	0	2	7	2	1
		80.0%	0.0%	33.3%	40.0%	0.0%	13.3%	46.7%	13.3%	6.7%
Total		103	6	61	75	23	11	66	28	31
		62.4%	3.6%	37.0%	45.5%	13.9%	6.7%	40.0%	17.0%	21.1%
Total	BANIKOARA	43	0	37	46	3	0	24	30	15
		43.9%	0.0%	37.8%	46.9%	3.1%	0.0%	24.5%	30.6%	16.7%
	BOUKOMBE	71	9	44	50	20	14	49	9	25
		74.7%	9.5%	46.3%	52.6%	21.1%	14.7%	51.6%	9.5%	27.5%
	COBLY	71	3	36	45	31	3	61	6	9
		79.8%	3.4%	40.4%	50.6%	34.8%	3.4%	68.5%	6.7%	10.7%
	DASSA ZOUME	59	2	21	45	6	5	34	21	13

Sex	Councils	Food	Fodder	Firewood	Shade	Controls soil and wind erosion	Delineation	Medicinal	Others	None
		57.8%	2.0%	20.6%	44.1%	5.9%	4.9%	33.3%	20.6%	19.4%
	DJOUGOU	63	0	22	34	10	12	32	6	7
		71.6%	0.0%	25.0%	38.6%	11.4%	13.6%	36.4%	6.8%	8.0%
	OUAKE	70	2	40	46	26	11	60	13	15
		71.4%	2.0%	40.8%	46.9%	26.5%	11.2%	61.2%	13.3%	15.3%
	TCHAOUROU	70	0	24	37	7	22	41	15	4
		72.2%	0.0%	24.7%	38.1%	7.2%	22.7%	42.3%	15.5%	4.4%
Total		447	16	224	303	103	67	301	100	88
		67.0%	2.4%	33.6%	45.4%	15.4%	10.0%	45.1%	15.0%	14.5%

Annex 15: Support needed by farmers to plant more tree segregated by group and municipality

Group	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
Control	BANIKOARA	10	16	20	9	10	2	5
		31.3%	50.0%	62.5%	28.1%	31.3%	8.3%	20.8%
	BOUKOMBE	18	16	20	17	15	2	5
		54.5%	48.5%	60.6%	51.5%	45.5%	6.5%	16.1%
	COBLY	17	10	16	15	9	0	2
		68.0%	40.0%	64.0%	60.0%	36.0%	0.0%	13.3%
	DASSA ZOUME	18	18	24	14	18	6	5
		47.4%	47.4%	63.2%	36.8%	47.4%	19.4%	16.1%
	DJOUGOU	13	14	16	13	17	1	3
		56.5%	60.9%	69.6%	56.5%	73.9%	4.3%	13.0%
	OUAKE	17	11	16	12	14	3	1
		58.6%	37.9%	55.2%	41.4%	48.3%	10.3%	3.4%
	TCHAOUROU	11	5	17	18	12	2	0
		39.3%	17.9%	60.7%	64.3%	42.9%	7.1%	0.0%
Total		104	90	129	98	95	16	21
		50.0%	43.3%	62.0%	47.1%	45.7%	8.8%	11.6%
Beneficiary	BANIKOARA	17	18	24	9	16	10	21
		25.8%	27.3%	36.4%	13.6%	24.2%	15.2%	31.8%

Group	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
	BOUKOMBE	31	32	37	28	36	6	4
		50.0%	51.6%	59.7%	45.2%	58.1%	12.8%	8.5%
	COBLY	36	26	39	36	36	2	1
		56.3%	40.6%	60.9%	56.3%	56.3%	3.4%	1.7%
	DASSA ZOUME	30	34	29	17	21	4	4
		46.9%	53.1%	45.3%	26.6%	32.8%	11.1%	11.1%
	DJOUGOU	22	17	17	38	7	10	10
		33.8%	26.2%	26.2%	58.5%	10.8%	15.6%	15.6%
	OUAKE	36	26	46	30	32	6	10
		52.2%	37.7%	66.7%	43.5%	46.4%	9.7%	16.1%
	TCHAOUROU	30	27	41	47	37	5	2
		43.5%	39.1%	59.4%	68.1%	53.6%	10.6%	4.3%
Total		202	180	233	205	185	43	52
		44.0%	39.2%	50.8%	44.7%	40.3%	11.3%	13.7%
Total	BANIKOARA	27	34	44	18	26	12	26
		27.6%	34.7%	44.9%	18.4%	26.5%	13.3%	28.9%
	BOUKOMBE	49	48	57	45	51	8	9
		51.6%	50.5%	60.0%	47.4%	53.7%	10.3%	11.5%
	COBLY	53	36	55	51	45	2	3

Group	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
		59.6%	40.4%	61.8%	57.3%	50.6%	2.7%	4.1%
	DASSA ZOUME	48	52	53	31	39	10	9
		47.1%	51.0%	52.0%	30.4%	38.2%	14.9%	13.4%
	DJOUGOU	35	31	33	51	24	11	13
		39.8%	35.2%	37.5%	58.0%	27.3%	12.6%	14.9%
	OUAKE	53	37	62	42	46	9	11
		54.1%	37.8%	63.3%	42.9%	46.9%	9.9%	12.1%
	TCHAOUROU	41	32	58	65	49	7	2
		42.3%	33.0%	59.8%	67.0%	50.5%	9.3%	2.7%
Total		306	270	362	303	280	59	73
		45.9%	40.5%	54.3%	45.4%	42.0%	10.5%	13.0%

Annex 16: Support needed by farmers to plant more tree segregated by sex and municipality

Sex	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
Male	BANIKOARA	18	19	28	11	13	9	17
		27.7%	29.2%	43.1%	16.9%	20.0%	15.0%	28.3%
	BOUKOMBE	28	26	30	23	28	6	4
		50.9%	47.3%	54.5%	41.8%	50.9%	14.0%	9.3%
	COBLY	38	25	45	39	31	2	2
		55.1%	36.2%	65.2%	56.5%	44.9%	3.4%	3.4%
	DASSA ZOUME	33	38	39	24	28	7	6
		44.6%	51.4%	52.7%	32.4%	37.8%	14.3%	12.2%
	DJOUGOU	32	29	32	49	21	8	8
		41.0%	37.2%	41.0%	62.8%	26.9%	10.4%	10.4%
	OUAKE	43	35	52	36	37	6	8
		54.4%	44.3%	65.8%	45.6%	46.8%	8.2%	11.0%
	TCHAOUROU	34	25	50	59	41	2	2
		41.5%	30.5%	61.0%	72.0%	50.0%	3.3%	3.3%
Total		226	197	276	241	199	40	47
		45.0%	39.2%	55.0%	48.0%	39.6%	9.5%	11.1%
Female	BANIKOARA	9	15	16	7	13	3	9
		27.3%	45.5%	48.5%	21.2%	39.4%	10.0%	30.0%

Sex	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
	BOUKOMBE	21	22	27	22	23	2	5
		52.5%	55.0%	67.5%	55.0%	57.5%	5.7%	14.3%
	COBLY	15	11	10	12	14	0	1
		75.0%	55.0%	50.0%	60.0%	70.0%	0.0%	7.1%
	DASSA ZOUME	15	14	14	7	11	3	3
		53.6%	50.0%	50.0%	25.0%	39.3%	16.7%	16.7%
	DJOUGOU	3	2	1	2	3	3	5
		30.0%	20.0%	10.0%	20.0%	30.0%	30.0%	50.0%
	OUAKE	10	2	10	6	9	3	3
		52.6%	10.5%	52.6%	31.6%	47.4%	16.7%	16.7%
	TCHAOUROU	7	7	8	6	8	5	0
		46.7%	46.7%	53.3%	40.0%	53.3%	35.7%	0.0%
Total		80	73	86	62	81	19	26
		48.5%	44.2%	52.1%	37.6%	49.1%	13.7%	18.7%
Total	BANIKOARA	27	34	44	18	26	12	26
		27.6%	34.7%	44.9%	18.4%	26.5%	13.3%	28.9%
	BOUKOMBE	49	48	57	45	51	8	9
		51.6%	50.5%	60.0%	47.4%	53.7%	10.3%	11.5%
	COBLY	53	36	55	51	45	2	3

Sex	Councils	Planting material, e.g. handles	Management of planting material	Agricultural material to manage trees	Land for planting trees	Water supply	None	Others
		59.6%	40.4%	61.8%	57.3%	50.6%	2.7%	4.1%
	DASSA ZOUME	48	52	53	31	39	10	9
		47.1%	51.0%	52.0%	30.4%	38.2%	14.9%	13.4%
	DJOUGOU	35	31	33	51	24	11	13
		39.8%	35.2%	37.5%	58.0%	27.3%	12.6%	14.9%
	OUAKE	53	37	62	42	46	9	11
		54.1%	37.8%	63.3%	42.9%	46.9%	9.9%	12.1%
	TCHAOUROU	41	32	58	65	49	7	2
		42.3%	33.0%	59.8%	67.0%	50.5%	9.3%	2.7%
Total		306	270	362	303	280	59	73
		45.9%	40.5%	54.3%	45.4%	42.0%	10.5%	13.0%

Annex 17: Sources of tree planting materials the previous year -number and percentage segregated by group and municipality

Group	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
Control	BANIKOARA	0	0	1	0	0
		0.0%	0.0%	3.1%	0.0%	0.0%
	BOUKOMBE	3	4	2	1	2
		9.1%	12.1%	6.1%	3.0%	6.1%
	COBLY	5	6	5	0	5
		20.0%	24.0%	20.0%	0.0%	20.0%
	DASSA ZOUME	0	1	0	0	0
		0.0%	2.6%	0.0%	0.0%	0.0%
	DJOUGOU	1	0	0	1	0
		4.3%	0.0%	0.0%	4.3%	0.0%
	OUAKE	6	5	1	0	1
		20.7%	17.2%	3.4%	0.0%	3.4%
	TCHAOUROU	14	0	1	0	0
		50.0%	0.0%	3.6%	0.0%	0.0%
Total		29	16	10	2	8
		13.9%	7.7%	4.8%	1.0%	4.0%
Beneficiary	BANIKOARA	1	1	0	1	0
		1.5%	1.5%	0.0%	1.5%	0.0%
	BOUKOMBE	7	9	3	2	4

Group	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
		11.3%	14.5%	4.8%	3.2%	7.0%
	COBLY	18	5	3	2	1
		28.1%	7.8%	4.7%	3.1%	1.7%
	DASSA ZOUME	3	8	0	2	0
		4.7%	12.5%	0.0%	3.1%	0.0%
	DJOUGOU	13	1	5	3	1
		20.0%	1.5%	7.7%	4.6%	2.0%
	OUAKE	12	15	1	0	3
		17.4%	21.7%	1.4%	0.0%	4.4%
	TCHAOUROU	11	5	2	1	0
		15.9%	7.2%	2.9%	1.4%	0.0%
Total		65	44	14	11	9
		14.2%	9.6%	3.1%	2.4%	2.1%
Total	BANIKOARA	1	1	1	1	0
		1.0%	1.0%	1.0%	1.0%	0.0%
	BOUKOMBE	10	13	5	3	6
		10.5%	13.7%	5.3%	3.2%	6.7%
	COBLY	23	11	8	2	6
		25.8%	12.4%	9.0%	2.2%	7.2%

Group	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
	DASSA ZOUME	3	9	0	2	0
		2.9%	8.8%	0.0%	2.0%	0.0%
	DJOUGOU	14	1	5	4	1
		15.9%	1.1%	5.7%	4.5%	1.4%
	OUAKE	18	20	2	0	4
		18.4%	20.4%	2.0%	0.0%	4.1%
	TCHAOUROU	25	5	3	1	0
		25.8%	5.2%	3.1%	1.0%	0.0%
Total		94	60	24	13	17
		14.1%	9.0%	3.6%	1.9%	2.7%

Annex 18: Sources of tree planting materials the previous year -number and percentage segregated by sex and municipality

Sex	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
Male	BANIKOARA	1	1	1	1	0
		1.5%	1.5%	1.5%	1.5%	0.0%
	BOUKOMBE	6	9	2	3	5
		10.9%	16.4%	3.6%	5.5%	9.6%
	COBLY	19	10	5	1	6
		27.5%	14.5%	7.2%	1.4%	9.2%
	DASSA ZOUME	2	8	0	2	0
		2.7%	10.8%	0.0%	2.7%	0.0%
	DJOUGOU	14	1	5	4	1
		17.9%	1.3%	6.4%	5.1%	1.6%
	OUAKE	15	18	2	0	4
		19.0%	22.8%	2.5%	0.0%	5.1%
	TCHAOUROU	24	5	2	1	0
		29.3%	6.1%	2.4%	1.2%	0.0%
Total		81	52	17	12	16
		16.1%	10.4%	3.4%	2.4%	3.4%
Female	BANIKOARA	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%
	BOUKOMBE	4	4	3	0	1

Sex	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
		10.0%	10.0%	7.5%	0.0%	2.6%
	COBLY	4	1	3	1	0
		20.0%	5.0%	15.0%	5.0%	0.0%
	DASSA ZOUME	1	1	0	0	0
		3.6%	3.6%	0.0%	0.0%	0.0%
	DJOUGOU	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%
	OUAKE	3	2	0	0	0
		15.8%	10.5%	0.0%	0.0%	0.0%
	TCHAOUROU	1	0	1	0	0
		6.7%	0.0%	6.7%	0.0%	0.0%
Total		13	8	7	1	1
		7.9%	4.8%	4.2%	.6%	.6%
Total	BANIKOARA	1	1	1	1	0
		1.0%	1.0%	1.0%	1.0%	0.0%
	BOUKOMBE	10	13	5	3	6
		10.5%	13.7%	5.3%	3.2%	6.7%
	COBLY	23	11	8	2	6
		25.8%	12.4%	9.0%	2.2%	7.2%

Sex	Councils	produced tree seedlings	purchased tree seedlings	obtained tree seedlings from NGOs	obtained tree seedlings from government offices	Brought wild tree seedlings from forests to grow on your farms or at the House
	DASSA ZOUME	3	9	0	2	0
		2.9%	8.8%	0.0%	2.0%	0.0%
	DJOUGOU	14	1	5	4	1
		15.9%	1.1%	5.7%	4.5%	1.4%
	OUAKE	18	20	2	0	4
		18.4%	20.4%	2.0%	0.0%	4.1%
	TCHAOUROU	25	5	3	1	0
		25.8%	5.2%	3.1%	1.0%	0.0%
Total		94	60	24	13	17
		14.1%	9.0%	3.6%	1.9%	2.7%

Annex 19: Perception of soil degradation segregated by group and municipality

Group	Councils	Improved fertility status	Soil in degradation phase	No change
Control	BANIKOARA	0	7	2
		0.0%	21.9%	6.3%
	BOUKOMBE	8	28	14
		24.2%	84.8%	42.4%
	COBLY	6	15	1
		24.0%	60.0%	4.0%
	DASSA ZOUME	1	18	0
		2.6%	47.4%	0.0%
	DJOUGOU	8	21	9
		34.8%	91.3%	39.1%
	OUAKE	4	20	5
		13.8%	69.0%	17.2%
	TCHAOUROU	15	22	11
		53.6%	78.6%	39.3%
Total		42	131	42
		20.2%	63.0%	20.2%
Beneficiary	BANIKOARA	0	20	0
		0.0%	30.3%	0.0%
	BOUKOMBE	16	42	12
		25.8%	67.7%	19.4%

Group	Councils	Improved fertility status	Soil in degradation phase	No change
	COBLY	23	42	15
		35.9%	65.6%	23.4%
	DASSA ZOUME	4	38	9
		6.3%	59.4%	14.1%
	DJOUGOU	4	45	7
		6.2%	69.2%	10.8%
	OUAKE	23	51	17
		33.3%	73.9%	24.6%
	TCHAOUROU	35	45	24
		50.7%	65.2%	34.8%
Total		105	283	84
		22.9%	61.7%	18.3%
Total	BANIKOARA	0	27	2
		0.0%	27.6%	2.0%
	BOUKOMBE	24	70	26
		25.3%	73.7%	27.4%
	COBLY	29	57	16
		32.6%	64.0%	18.0%
	DASSA ZOUME	5	56	9
		4.9%	54.9%	8.8%
	DJOUGOU	12	66	16

Group	Councils	Improved fertility status	Soil in degradation phase	No change
		13.6%	75.0%	18.2%
	OUAKE	27	71	22
		27.6%	72.4%	22.4%
	TCHAOUROU	50	67	35
		51.5%	69.1%	36.1%
Total		147	414	126
		22.0%	62.1%	18.9%

Annex 20: Perception of soil degradation segregated by sex and municipality

Sex	Councils	Improved fertility status	Soil in degradation phase	No change
Male	BANIKOARA	0	19	1
		0.0%	29.2%	1.5%
	BOUKOMBE	19	39	14
		34.5%	70.9%	25.5%
	COBLY	19	46	11
		27.5%	66.7%	15.9%
	DASSA ZOUME	4	40	7
		5.4%	54.1%	9.5%
	DJOUGOU	11	64	15
		14.1%	82.1%	19.2%
	OUAKE	22	57	17
		27.8%	72.2%	21.5%
	TCHAOUROU	42	58	28
		51.2%	70.7%	34.1%
Total		117	323	93
		23.3%	64.3%	18.5%
Female	BANIKOARA	0	8	1
		0.0%	24.2%	3.0%
	BOUKOMBE	5	31	12
		12.5%	77.5%	30.0%

Sex	Councils	Improved fertility status	Soil in degradation phase	No change
	COBLY	10	11	5
		50.0%	55.0%	25.0%
	DASSA ZOUME	1	16	2
		3.6%	57.1%	7.1%
	DJOUGOU	1	2	1
		10.0%	20.0%	10.0%
	OUAKE	5	14	5
		26.3%	73.7%	26.3%
	TCHAOUROU	8	9	7
		53.3%	60.0%	46.7%
Total		30	91	33
		18.2%	55.2%	20.0%
Total	BANIKOARA	0	27	2
		0.0%	27.6%	2.0%
	BOUKOMBE	24	70	26
		25.3%	73.7%	27.4%
	COBLY	29	57	16
		32.6%	64.0%	18.0%
	DASSA ZOUME	5	56	9
		4.9%	54.9%	8.8%
	DJOUGOU	12	66	16

Sex	Councils	Improved fertility status	Soil in degradation phase	No change
	OUAKE	13.6%	75.0%	18.2%
		27	71	22
		27.6%	72.4%	22.4%
	TCHAOUROU	50	67	35
		51.5%	69.1%	36.1%
Total		147	414	126
		22.0%	62.1%	18.9%

Annex 21 : Factors that influence improvement in fertility status segregated by group and municipality

Group	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
Control	BOUKOMBE	5	1	1	0	7	1
		62.5%	12.5%	12.5%	0.0%	87.5%	3.0%
	COBLY	0	3	6	0	6	0
		0.0%	50.0%	100.0%	0.0%	100.0%	0.0%
	DASSA ZOUME	0	1	0	0	1	0
		0.0%	100.0%	0.0%	0.0%	100.0%	0.0%
	DJOUGOU	1	0	0	1	6	0
		12.5%	0.0%	0.0%	12.5%	75.0%	0.0%
	OUAKE	1	3	3	0	4	0
		25.0%	75.0%	75.0%	0.0%	100.0%	0.0%
	TCHAOUROU	3	9	3	1	10	0
		20.0%	60.0%	20.0%	6.7%	66.7%	0.0%
Total		10	17	13	2	34	1
		23.8%	40.5%	31.0%	4.8%	81.0%	.5%
Beneficiary	BOUKOMBE	7	7	8	6	10	1
		43.8%	43.8%	50.0%	37.5%	62.5%	1.6%
	COBLY	9	5	16	3	17	0
		39.1%	21.7%	69.6%	13.0%	73.9%	0.0%

Group	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
	DASSA ZOUME	1	4	0	0	2	0
		25.0%	100.0%	0.0%	0.0%	50.0%	0.0%
	DJOUGOU	0	4	1	0	0	0
		0.0%	100.0%	25.0%	0.0%	0.0%	0.0%
	OUAKE	7	6	15	3	16	1
		30.4%	26.1%	65.2%	13.0%	69.6%	1.4%
	TCHAOUROU	5	15	8	1	22	0
		14.3%	42.9%	22.9%	2.9%	62.9%	0.0%
Total		29	41	48	13	67	2
		27.6%	39.0%	45.7%	12.4%	63.8%	.4%
Total	BOUKOMBE	12	8	9	6	17	2
		50.0%	33.3%	37.5%	25.0%	70.8%	2.1%
	COBLY	9	8	22	3	23	0
		31.0%	27.6%	75.9%	10.3%	79.3%	0.0%
	DASSA ZOUME	1	5	0	0	3	0
		20.0%	100.0%	0.0%	0.0%	60.0%	0.0%
	DJOUGOU	1	4	1	1	6	0
		8.3%	33.3%	8.3%	8.3%	50.0%	0.0%
	OUAKE	8	9	18	3	20	1

Group	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
	TCHAOUROU	29.6%	33.3%	66.7%	11.1%	74.1%	1.0%
		8	24	11	2	32	0
		16.0%	48.0%	22.0%	4.0%	64.0%	0.0%
Total		39	58	61	15	101	3
		26.5%	39.5%	41.5%	10.2%	68.7%	.4%

Annex 22: Factors that influence improvement in fertility status segregated by group and municipality

Sex	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
Male	BOUKOMBE	8	6	7	4	15	0
		42.1%	31.6%	36.8%	21.1%	78.9%	0.0%
	COBLY	5	5	13	1	14	0
		26.3%	26.3%	68.4%	5.3%	73.7%	0.0%
	DASSA ZOUME	0	4	0	0	2	0
		0.0%	100.0%	0.0%	0.0%	50.0%	0.0%
	DJOUGOU	1	4	1	0	6	0
		9.1%	36.4%	9.1%	0.0%	54.5%	0.0%
	OUAKE	8	9	15	1	16	1
		36.4%	40.9%	68.2%	4.5%	72.7%	1.3%
	TCHAOUROU	7	19	9	1	27	0
		16.7%	45.2%	21.4%	2.4%	64.3%	0.0%
Total		29	47	45	7	80	1
		24.8%	40.2%	38.5%	6.0%	68.4%	.2%
Female	BOUKOMBE	4	2	2	2	2	2
		80.0%	40.0%	40.0%	40.0%	40.0%	5.0%
	COBLY	4	3	9	2	9	0
		40.0%	30.0%	90.0%	20.0%	90.0%	0.0%
	DASSA ZOUME	1	1	0	0	1	0

Sex	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
		100.0%	100.0%	0.0%	0.0%	100.0%	0.0%
	DJOUGOU	0	0	0	1	0	0
		0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
	OUAKE	0	0	3	2	4	0
		0.0%	0.0%	60.0%	40.0%	80.0%	0.0%
	TCHAOUROU	1	5	2	1	5	0
		12.5%	62.5%	25.0%	12.5%	62.5%	0.0%
Total		10	11	16	8	21	2
		33.3%	36.7%	53.3%	26.7%	70.0%	1.2%
Total	BOUKOMBE	12	8	9	6	17	2
		50.0%	33.3%	37.5%	25.0%	70.8%	2.1%
	COBLY	9	8	22	3	23	0
		31.0%	27.6%	75.9%	10.3%	79.3%	0.0%
	DASSA ZOUME	1	5	0	0	3	0
		20.0%	100.0%	0.0%	0.0%	60.0%	0.0%
	DJOUGOU	1	4	1	1	6	0
		8.3%	33.3%	8.3%	8.3%	50.0%	0.0%
	OUAKE	8	9	18	3	20	1
		29.6%	33.3%	66.7%	11.1%	74.1%	1.0%

Sex	Councils	Application of organic fertilizers	Application of inorganic fertilizers	Soil fertility enhancement practices (example: conservation agriculture, crop rotation)	Soil erosion control	Others	Others
	TCHAOUROU	8	24	11	2	32	0
		16.0%	48.0%	22.0%	4.0%	64.0%	0.0%
Total		39	58	61	15	101	3
		26.5%	39.5%	41.5%	10.2%	68.7%	.4%

Annex 23: Factors that influence soil degradation segregated by group and municipality

Group	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
Control	BANIKOARA	0	1	2	0	0	5	2	2	1	0	0	32
		0.0%	14.3%	28.6%	0.0%	0.0%	71.4%	28.6%	28.6%	14.3%	0.0%	0.0%	100.0 %
	BOUKOMBE	0	7	22	6	7	12	17	7	10	1	1	32
		0.0%	25.0%	78.6%	21.4%	25.0 %	42.9%	58.6%	25.0%	35.7%	3.6%	3.6%	97.0%
	COBLY	2	5	12	4	4	5	11	2	8	1	4	25
		13.3%	33.3%	75.0%	26.7%	26.7 %	33.3%	73.3%	13.3%	53.3%	6.7%	26.7 %	100.0 %
	DASSA ZOUME	1	6	12	3	0	9	3	13	9	1	1	37
		5.6%	33.3%	66.7%	16.7%	0.0%	50.0%	16.7%	72.2%	50.0%	5.6%	5.6%	97.4%
	DJOUGOU	6	12	16	2	6	6	12	2	9	0	0	8
		28.6%	57.1%	76.2%	9.5%	28.6 %	28.6%	57.1%	9.5%	42.9%	0.0%	0.0%	34.8%
	OUAKE	1	7	17	1	2	7	9	1	10	2	0	29
		5.0%	35.0%	85.0%	5.0%	10.0 %	35.0%	45.0%	5.0%	50.0%	10.0%	0.0%	100.0 %
		0	4	11	1	2	8	12	6	7	1	0	10

Group	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
	TCHAOUROU	0.0%	18.2%	50.0%	4.5%	9.1%	36.4%	54.5%	27.3%	31.8%	4.5%	0.0%	35.7%
Total		10	42	92	17	21	52	66	33	54	6	6	173
		7.6%	32.1%	69.7%	13.0%	16.0 %	39.7%	50.0%	25.2%	41.2%	4.6%	4.6%	83.2%
Beneficiary	BANIKOARA	0	3	10	1	0	6	4	16	7	1	0	66
		0.0%	15.0%	50.0%	5.0%	0.0%	30.0%	20.0%	80.0%	35.0%	5.0%	0.0%	100.0 %
	BOUKOMBE	5	14	29	5	4	8	29	2	11	3	4	54
		11.9%	33.3%	69.0%	11.9%	9.5%	19.0%	69.0%	4.8%	26.2%	7.1%	9.5%	87.1%
	COBLY	3	16	27	8	3	6	28	5	10	1	1	57
		7.1%	38.1%	64.3%	19.0%	7.1%	14.3%	66.7%	11.9%	23.8%	2.4%	2.4%	89.1%
	DASSA ZOUME	0	17	25	4	1	21	15	14	13	9	1	60
		0.0%	43.6%	65.8%	10.5%	2.6%	55.3%	39.5%	36.8%	34.2%	23.7%	2.6%	93.8%
	DJOUGOU	3	26	18	3	19	14	14	15	8	5	0	48
		6.7%	57.8%	40.0%	6.7%	42.2 %	31.1%	31.1%	33.3%	17.8%	11.1%	0.0%	73.8%
	OUAKE	15	21	43	7	15	21	31	10	20	11	1	69

Group	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
		29.4%	41.2%	84.3%	13.7%	29.4 %	41.2%	60.8%	19.6%	39.2%	21.6%	2.0%	100.0 %
	TCHAOUROU	11	10	35	3	16	4	26	4	11	6	0	25
		24.4%	22.2%	77.8%	6.7%	35.6 %	8.9%	57.8%	8.9%	24.4%	13.3%	0.0%	36.2%
Total		37	107	187	31	58	80	147	66	80	36	7	379
		13.1%	37.7%	66.1%	11.0%	20.5 %	28.3%	51.9%	23.3%	28.3%	12.7%	2.5%	82.6%
	BANIKOARA	0	4	12	1	0	11	6	18	8	1	0	98
		0.0%	14.8%	44.4%	3.7%	0.0%	40.7%	22.2%	66.7%	29.6%	3.7%	0.0%	100.0 %
	BOUKOMBE	5	21	51	11	11	20	46	9	21	4	5	86
		7.1%	30.0%	72.9%	15.7%	15.7 %	28.6%	64.8%	12.9%	30.0%	5.7%	7.1%	90.5%
Total	COBLY	5	21	39	12	7	11	39	7	18	2	5	82
		8.8%	36.8%	67.2%	21.1%	12.3 %	19.3%	68.4%	12.3%	31.6%	3.5%	8.8%	92.1%
	DASSA ZOUME	1	23	37	7	1	30	18	27	22	10	2	97
		1.8%	40.4%	66.1%	12.5%	1.8%	53.6%	32.1%	48.2%	39.3%	17.9%	3.6%	95.1%

Group	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
	DJOUGOU	9	38	34	5	25	20	26	17	17	5	0	56
		13.6%	57.6%	51.5%	7.6%	37.9 %	30.3%	39.4%	25.8%	25.8%	7.6%	0.0%	63.6%
	OUAKE	16	28	60	8	17	28	40	11	30	13	1	98
		22.5%	39.4%	84.5%	11.3%	23.9 %	39.4%	56.3%	15.5%	42.3%	18.3%	1.4%	100.0 %
	TCHAOUROU	11	14	46	4	18	12	38	10	18	7	0	35
		16.4%	20.9%	68.7%	6.0%	26.9 %	17.9%	56.7%	14.9%	26.9%	10.4%	0.0%	36.1%
Total		47	149	279	48	79	132	213	99	134	42	13	552
		11.4%	35.9%	67.2%	11.6%	19.1 %	31.9%	51.3%	23.9%	32.4%	10.1%	3.1%	82.8%

Annex 24: Factors that influence soil degradation segregated by sex and municipality

Sex	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
Male	BANIKOARA	0	3	8	0	0	8	4	14	5	1	0	65
		0.0%	15.8%	42.1%	0.0%	0.0%	42.1%	21.1%	73.7%	26.3%	5.3%	0.0%	100.0%
	BOUKOMBE	4	11	27	7	8	7	28	1	11	2	3	49
		10.3%	28.2%	69.2%	17.9%	20.5%	17.9%	71.8%	2.6%	28.2%	5.1%	7.7%	89.1%
	COBLY	4	16	32	8	6	11	30	5	15	2	4	63
		8.7%	34.8%	69.6%	17.4%	13.0%	23.9%	65.2%	10.9%	32.6%	4.3%	8.7%	91.3%
	DASSA ZOUME	1	19	24	3	1	24	14	16	13	8	0	71
		2.5%	47.5%	60.0%	7.5%	2.5%	60.0%	35.0%	40.0%	32.5%	20.0%	0.0%	95.9%
	DJOUGOU	9	37	32	5	25	18	25	17	17	5	0	47
		14.1%	57.8%	50.0%	7.8%	39.1%	28.1%	39.1%	26.6%	26.6%	7.8%	0.0%	60.3%
	OUAKE	15	26	48	7	16	24	34	11	25	12	1	79
		26.3%	45.6%	84.2%	12.3%	28.1%	42.1%	59.6%	19.3%	43.9%	21.1%	1.8%	100.0%
	TCHAOUROU	9	12	39	4	15	12	32	10	16	5	0	28
		15.5%	20.7%	67.2%	6.9%	25.9%	20.7%	55.2%	17.2%	27.6%	8.6%	0.0%	34.1%
Total		42	124	210	34	71	104	167	74	102	35	8	402
		13.0%	38.4%	65.0%	10.5%	22.0%	32.2%	51.7%	22.9%	31.6%	10.8%	2.5%	80.1%
Female	BANIKOARA	0	1	4	1	0	3	2	4	3	0	0	33

Sex	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
		0.0%	12.5%	50.0%	12.5%	0.0%	37.5%	25.0%	50.0%	37.5%	0.0%	0.0%	100.0%
	BOUKOMBE	1	10	24	4	3	13	18	8	10	2	2	37
		3.2%	32.3%	77.4%	12.9%	9.7%	41.9%	56.3%	25.8%	32.3%	6.5%	6.5%	92.5%
	COBLY	1	5	7	4	1	0	9	2	3	0	1	19
		9.1%	45.5%	58.3%	36.4%	9.1%	0.0%	81.8%	18.2%	27.3%	0.0%	9.1%	95.0%
	DASSA ZOUME	0	4	13	4	0	6	4	11	9	2	2	26
		0.0%	23.5%	81.3%	25.0%	0.0%	37.5%	25.0%	68.8%	56.3%	12.5%	12.5%	92.9%
	DJOUGOU	0	1	2	0	0	2	1	0	0	0	0	9
		0.0%	50.0%	100.0%	0.0%	0.0%	100.0%	50.0%	0.0%	0.0%	0.0%	0.0%	90.0%
	OUAKE	1	2	12	1	1	4	6	0	5	1	0	19
		7.1%	14.3%	85.7%	7.1%	7.1%	28.6%	42.9%	0.0%	35.7%	7.1%	0.0%	100.0%
	TCHAOUROU	2	2	7	0	3	0	6	0	2	2	0	7
		22.2%	22.2%	77.8%	0.0%	33.3%	0.0%	66.7%	0.0%	22.2%	22.2%	0.0%	46.7%
Total		5	25	69	14	8	28	46	25	32	7	5	150
		5.5%	27.2%	75.0%	15.4%	8.8%	30.8%	50.0%	27.5%	35.2%	7.7%	5.5%	90.9%
Total	BANIKOARA	0	4	12	1	0	11	6	18	8	1	0	98
		0.0%	14.8%	44.4%	3.7%	0.0%	40.7%	22.2%	66.7%	29.6%	3.7%	0.0%	100.0%
	BOUKOMBE	5	21	51	11	11	20	46	9	21	4	5	86

Sex	Councils	Increase in salinity	Intensive land use	Bad farming practices	Minimal/insufficient application of fertilizer	Flood	Monoculture	Tree cutting	Extreme climatic events leading for example to floods and/or drought	Applying too much or the wrong type of fertilizer	pests and diseases	Others	Others
		7.1%	30.0%	72.9%	15.7%	15.7%	28.6%	64.8%	12.9%	30.0%	5.7%	7.1%	90.5%
	COBLY	5	21	39	12	7	11	39	7	18	2	5	82
		8.8%	36.8%	67.2%	21.1%	12.3%	19.3%	68.4%	12.3%	31.6%	3.5%	8.8%	92.1%
	DASSA ZOUME	1	23	37	7	1	30	18	27	22	10	2	97
		1.8%	40.4%	66.1%	12.5%	1.8%	53.6%	32.1%	48.2%	39.3%	17.9%	3.6%	95.1%
	DJOUGOU	9	38	34	5	25	20	26	17	17	5	0	56
		13.6%	57.6%	51.5%	7.6%	37.9%	30.3%	39.4%	25.8%	25.8%	7.6%	0.0%	63.6%
	OUAKE	16	28	60	8	17	28	40	11	30	13	1	98
		22.5%	39.4%	84.5%	11.3%	23.9%	39.4%	56.3%	15.5%	42.3%	18.3%	1.4%	100.0%
	TCHAOUROU	11	14	46	4	18	12	38	10	18	7	0	35
		16.4%	20.9%	68.7%	6.0%	26.9%	17.9%	56.7%	14.9%	26.9%	10.4%	0.0%	36.1%
Total		47	149	279	48	79	132	213	99	134	42	13	552
		11.4%	35.9%	67.2%	11.6%	19.1%	31.9%	51.3%	23.9%	32.4%	10.1%	3.1%	82.8%

Annex 25: Reason for not changing segregated by group and municipality

Group	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
Control	BANIKOARA	0	0	2
		0.0%	0.0%	100.0%
	BOUKOMBE	3	6	13
		21.4%	42.9%	92.9%
	COBLY	1	0	0
		100.0%	0.0%	0.0%
	DJOUGOU	1	0	9
		11.1%	0.0%	100.0%
	OUAKE	1	2	5
		20.0%	40.0%	100.0%
	TCHAOUROU	0	5	11
		0.0%	45.5%	100.0%
Total		6	13	40
		14.3%	31.0%	95.2%
Beneficiary	BOUKOMBE	4	3	10
		33.3%	25.0%	83.3%
	COBLY	4	1	14
		26.7%	6.7%	93.3%
	DASSA ZOUME	7	0	4

Group	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
		77.8%	0.0%	44.4%
	DJOUGOU	2	0	6
		28.6%	0.0%	85.7%
	OUAKE	11	8	15
		64.7%	47.1%	88.2%
	TCHAOUROU	4	8	23
		16.7%	33.3%	95.8%
Total		32	20	72
		38.1%	23.8%	85.7%
Total	BANIKOARA	0	0	2
		0.0%	0.0%	100.0%
	BOUKOMBE	7	9	23
		26.9%	34.6%	88.5%
	COBLY	5	1	14
		31.3%	6.3%	87.5%
	DASSA ZOUME	7	0	4
		77.8%	0.0%	44.4%
	DJOUGOU	3	0	15
		18.8%	0.0%	93.8%
	OUAKE	12	10	20

Group	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
	TCHAOUROU	54.5%	45.5%	90.9%
		4	13	34
		11.4%	37.1%	97.1%
Total		38	33	112
		30.2%	26.2%	88.9%

Annex 26: Reason for not changing segregated by sex and municipality

Sex	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
Male	BANIKOARA	0	0	1
		0.0%	0.0%	100.0%
	BOUKOMBE	3	5	12
		21.4%	35.7%	85.7%
	COBLY	3	0	10
		27.3%	0.0%	90.9%
	DASSA ZOUME	5	0	3
		71.4%	0.0%	42.9%
	DJOUGOU	3	0	14
		20.0%	0.0%	93.3%
	OUAKE	9	9	15
		52.9%	52.9%	88.2%
	TCHAOUROU	3	12	28
		10.7%	42.9%	100.0%
Total		26	26	83
		28.0%	28.0%	89.2%
Female	BANIKOARA	0	0	1
		0.0%	0.0%	100.0%
	BOUKOMBE	4	4	11

Sex	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
		33.3%	33.3%	91.7%
	COBLY	2	1	4
		40.0%	20.0%	80.0%
	DASSA ZOUME	2	0	1
		100.0%	0.0%	50.0%
	DJOUGOU	0	0	1
		0.0%	0.0%	100.0%
	OUAKE	3	1	5
		60.0%	20.0%	100.0%
	TCHAOUROU	1	1	6
		14.3%	14.3%	85.7%
Total		12	7	29
		36.4%	21.2%	87.9%
	BANIKOARA	0	0	2
		0.0%	0.0%	100.0%
	BOUKOMBE	7	9	23
Total		26.9%	34.6%	88.5%
	COBLY	5	1	14
		31.3%	6.3%	87.5%
	DASSA ZOUME	7	0	4

Sex	Councils	Good agricultural practices, e.g. conservation agriculture or crop rotation	Reduction of activities within the farm	Fertilizer application
		77.8%	0.0%	44.4%
	DJOUGOU	3	0	15
		18.8%	0.0%	93.8%
	OUAKE	12	10	20
		54.5%	45.5%	90.9%
	TCHAOUROU	4	13	34
		11.4%	37.1%	97.1%
Total		38	33	112
		30.2%	26.2%	88.9%

Annex 27: Access to inputs and credits segregated by group and municipality

Group	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
Control	BANIKOARA	2	11	20	1	9	0	0
		6.3%	34.4%	62.5%	3.1%	28.1%	0.0%	0.0%
	BOUKOMBE	10	23	24	6	11	5	2
		30.3%	69.7%	72.7%	18.2%	33.3%	16.1%	28.6%
	COBLY	4	5	17	5	6	0	0
		16.0%	20.0%	68.0%	20.0%	24.0%	0.0%	0.0%
	DASSA ZOUME	3	12	24	1	7	0	0
		7.9%	31.6%	63.2%	2.6%	18.4%	0.0%	0.0%
	DJOUGOU	12	6	16	7	5	2	0
		52.2%	26.1%	69.6%	30.4%	21.7%	8.7%	0.0%
	OUAKE	6	17	20	3	2	0	0
		20.7%	58.6%	69.0%	10.3%	6.9%	0.0%	0.0%
	TCHAOUROU	13	0	26	0	12	6	2
		46.4%	0.0%	92.9%	0.0%	42.9%	21.4%	5.0%
Total		50	74	147	23	52	13	
		24.0%	35.6%	70.7%	11.1%	25.0%	7.2%	
Beneficiary	BANIKOARA	1	21	45	5	3	0	

Group	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
		1.5%	31.8%	68.2%	7.6%	4.5%	0.0%	
	BOUKOMBE	12	26	48	14	4	0	
		19.4%	41.9%	77.4%	22.6%	6.5%	0.0%	
	COBLY	11	23	50	8	12	0	
		17.2%	35.9%	78.1%	12.5%	18.8%	0.0%	
	DASSA ZOUME	13	27	37	6	10	0	
		20.3%	42.2%	57.8%	9.4%	15.6%	0.0%	
	DJOUGOU	21	6	50	3	23	10	
		32.3%	9.2%	76.9%	4.6%	35.4%	15.6%	
	OUAKE	11	48	59	20	9	2	
		15.9%	69.6%	85.5%	29.0%	13.0%	3.2%	
	TCHAOUROU	29	6	62	4	18	4	0
		42.0%	8.8%	89.9%	5.8%	26.5%	8.5%	0.0%
Total		98	157	351	60	79	16	2
		21.4%	34.3%	76.5%	13.1%	17.2%	4.2%	9.1%
Total	BANIKOARA	3	32	65	6	12	0	0
		3.1%	32.7%	66.3%	6.1%	12.2%	0.0%	0.0%
	BOUKOMBE	22	49	72	20	15	5	0

Group	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
		23.2%	51.6%	75.8%	21.1%	15.8%	6.4%	0.0%
	COBLY	15	28	67	13	18	0	0
		16.9%	31.5%	75.3%	14.6%	20.2%	0.0%	0.0%
	DASSA ZOUME	16	39	61	7	17	0	0
		15.7%	38.2%	59.8%	6.9%	16.7%	0.0%	0.0%
	DJOUGOU	33	12	66	10	28	12	0
		37.5%	13.6%	75.0%	11.4%	31.8%	13.8%	0.0%
	OUAKE	17	65	79	23	11	2	2
		17.3%	66.3%	80.6%	23.5%	11.2%	2.2%	1.5%
	TCHAOUROU	42	6	88	4	30	10	
		43.3%	6.3%	90.7%	4.1%	31.3%	13.3%	
Total		148	231	498	83	131	29	
		22.2%	34.7%	74.7%	12.4%	19.7%	5.2%	

Annex 28: Access to inputs and credits segregated by sex and municipality

Sex	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
Male	BANIKOARA	2	22	41	5	6	0	0
		3.1%	33.8%	63.1%	7.7%	9.2%	0.0%	0.0%
	BOUKOMBE	13	26	44	11	8	4	2
		23.6%	47.3%	80.0%	20.0%	14.5%	9.3%	12.5%
	COBLY	12	24	54	12	14	0	0
		17.4%	34.8%	78.3%	17.4%	20.3%	0.0%	0.0%
	DASSA ZOUME	15	30	47	5	14	0	0
		20.3%	40.5%	63.5%	6.8%	18.9%	0.0%	0.0%
	DJOUGOU	32	11	63	9	26	12	0
		41.0%	14.1%	80.8%	11.5%	33.3%	15.6%	0.0%
	OUAKE	15	54	64	20	9	2	0
		19.0%	68.4%	81.0%	25.3%	11.4%	2.7%	0.0%
	TCHAOUROU	34	6	74	4	26	9	0
		41.5%	7.4%	90.2%	4.9%	32.1%	14.8%	0.0%
Total		123	173	387	66	103	27	2
		24.5%	34.5%	77.1%	13.1%	20.6%	6.4%	1.9%
Female	BANIKOARA	1	10	24	1	6	0	

Sex	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
		3.0%	30.3%	72.7%	3.0%	18.2%	0.0%	
	BOUKOMBE	9	23	28	9	7	1	
		22.5%	57.5%	70.0%	22.5%	17.5%	2.9%	
	COBLY	3	4	13	1	4	0	
		15.0%	20.0%	65.0%	5.0%	20.0%	0.0%	
	DASSA ZOUME	1	9	14	2	3	0	
		3.6%	32.1%	50.0%	7.1%	10.7%	0.0%	
	DJOUGOU	1	1	3	1	2	0	
		10.0%	10.0%	30.0%	10.0%	20.0%	0.0%	
	OUAKE	2	11	15	3	2	0	
		10.5%	57.9%	78.9%	15.8%	10.5%	0.0%	
	TCHAOUROU	8	0	14	0	4	1	
		53.3%	0.0%	93.3%	0.0%	26.7%	7.1%	
Total		25	58	111	17	28	2	0
		15.2%	35.2%	67.3%	10.3%	17.0%	1.4%	0.0%
Total	BANIKOARA	3	32	65	6	12	0	2
		3.1%	32.7%	66.3%	6.1%	12.2%	0.0%	9.1%
	BOUKOMBE	22	49	72	20	15	5	0

Sex	Councils	Use of purchased, certified and improved seeds	Use of purchased inorganic mineral fertilizers	Purchase of pesticides and herbicides	Purchase of medicinal and veterinary products	Obtaining credit or a loan for agricultural activities	Subscription to agricultural or livestock insurance	Insurance based on weather forecast
		23.2%	51.6%	75.8%	21.1%	15.8%	6.4%	0.0%
	COBLY	15	28	67	13	18	0	0
		16.9%	31.5%	75.3%	14.6%	20.2%	0.0%	0.0%
	DASSA ZOUME	16	39	61	7	17	0	0
		15.7%	38.2%	59.8%	6.9%	16.7%	0.0%	0.0%
	DJOUGOU	33	12	66	10	28	12	0
		37.5%	13.6%	75.0%	11.4%	31.8%	13.8%	0.0%
	OUAKE	17	65	79	23	11	2	0
		17.3%	66.3%	80.6%	23.5%	11.2%	2.2%	0.0%
	TCHAOUROU	42	6	88	4	30	10	2
		43.3%	6.3%	90.7%	4.1%	31.3%	13.3%	1.5%
Total		148	231	498	83	131	29	
		22.2%	34.7%	74.7%	12.4%	19.7%	5.2%	

Annex 29: Membership in different association segregated by group and municipality

Group	Councils	Productivity enhancement/value addition (i.e. livestock, [illegible])	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, [illegible]	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops, trees or fish)	Savings and/or credit	Irrigation
Control	BANIKOARA	1	0	1	3	0	0	0	1	0	0	0	0	3	9	0
		5.0%	0.0%	5.3%	15.8%	0.0%	0.0%	0.0%	5.6%	0.0%	0.0%	0.0%	0.0%	16.7%	47.4 %	0.0 %
	BOUKOMBE	7	3	0	3	0	3	4	9	1	0	2	0	9	8	0
		24.1%	10.3 %	0.0%	10.0%	0.0%	9.7%	12.9 %	29.0 %	3.2%	0.0%	6.5%	0.0%	29.0%	25.8 %	0.0 %
	COBLY	4	2	3	3	3	2	1	4	0	0	0	0	5	5	0
		16.7%	9.5%	13.0 %	13.0%	13.0 %	8.7%	4.5%	17.4 %	0.0%	0.0%	0.0%	0.0%	22.7%	21.7 %	0.0 %
	DASSA ZOUME	1	0	0	1	0	0	0	0	0	0	0	0	2	7	0
		5.3%	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.8%	41.2 %	0.0 %
	DJOUGOU	3	0	0	0	0	0	0	2	0	0	0	0	9	3	0
		17.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.3 %	0.0%	0.0%	0.0%	0.0%	60.0%	23.1 %	0.0 %
	OUAKE	8	4	2	7	1	4	4	6	0	0	2	1	13	4	1
		38.1%	22.2 %	9.1%	36.8%	5.6%	21.1 %	21.1 %	31.6 %	0.0%	0.0%	11.1%	5.9%	72.2%	22.2 %	5.9 %

Group	Councils	Productivity enhancement/value addition (i.e. livestock, [illegible])	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, [illegible]	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops, trees or fish)	Savings and/or credit	Irrigation
	TCHAOUROU	1	1	0	0	0	0	0	0	0	1	2	2	8	6	0
		3.8%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	8.0%	8.0%	32.0%	22.2 %	0.0 %
Total		25	10	6	17	4	9	9	22	1	1	6	3	49	42	1
		16.0%	7.2%	4.1%	11.6%	2.8%	6.3%	6.3%	15.2 %	.7%	.7%	4.2%	2.1%	33.6%	28.4 %	.7%
Beneficiary	BANIKOARA	3	0	1	1	0	0	0	0	0	0	0	0	7	2	0
		8.3%	0.0%	2.6%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.4%	5.4%	0.0 %
	BOUKOMBE	9	8	5	7	8	4	2	14	3	5	3	4	13	6	2
		22.5%	22.2 %	13.5 %	18.9%	21.6 %	10.8 %	5.1%	36.8 %	8.1%	13.9%	8.3%	11.1 %	35.1%	16.2 %	5.6 %
	COBLY	13	0	1	0	1	1	4	9	0	0	1	0	14	4	2
		31.7%	0.0%	2.9%	0.0%	2.9%	2.9%	11.4 %	26.5 %	0.0%	0.0%	2.9%	0.0%	36.8%	11.1 %	5.9 %
	DASSA ZOUME	5	4	1	0	1	0	1	2	0	1	1	1	6	8	0
		15.6%	14.3 %	3.4%	0.0%	3.6%	0.0%	3.6%	6.9%	0.0%	3.3%	3.3%	3.3%	20.7%	27.6 %	0.0 %
		10	1	1	1	1	2	0	3	0	0	0	0	6	6	0

Group	Councils	Productivity enhancement/value addition (i.e. livestock, [illegible])	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, [illegible]	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops, trees or fish)	Savings and/or credit	Irrigation
	DJOUGOU	23.3%	2.6%	2.6%	2.6%	2.7%	5.6%	0.0%	8.6%	0.0%	0.0%	0.0%	0.0%	17.1%	17.1 %	0.0 %
	OUAKE	15	8	4	11	1	5	13	8	3	0	6	2	23	9	0
		30.6%	17.4 %	8.5%	24.4%	2.3%	11.4 %	28.3 %	17.8 %	6.8%	0.0%	14.3%	4.8%	54.8%	20.9 %	0.0 %
	TCHAOUROU	5	1	2	3	7	2	1	8	1	1	1	1	14	16	1
		9.3%	2.0%	3.8%	6.0%	14.0 %	4.2%	2.0%	16.0 %	2.1%	2.1%	2.3%	2.2%	30.4%	33.3 %	2.3 %
Total		60	22	15	23	19	14	21	44	7	7	12	8	83	51	5
		20.3%	8.4%	5.4%	8.4%	7.1%	5.3%	7.7%	16.4 %	2.7%	2.7%	4.6%	3.1%	31.6%	19.2 %	2.0 %
Total	BANIKOARA	4	0	2	4	0	0	0	1	0	0	0	0	10	11	0
		7.1%	0.0%	3.5%	6.9%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	18.5%	19.6 %	0.0 %
	BOUKOMBE	16	11	5	10	8	7	6	23	4	5	5	4	22	14	2
		23.2%	16.9 %	7.4%	14.9%	11.8 %	10.3 %	8.6%	33.3 %	5.9%	7.5%	7.5%	6.0%	32.4%	20.6 %	3.0 %
	COBLY	17	2	4	3	4	3	5	13	0	0	1	0	19	9	2
		26.2%	4.1%	6.9%	5.2%	6.9%	5.2%	8.8%	22.8 %	0.0%	0.0%	1.8%	0.0%	31.7%	15.3 %	3.6 %

Group	Councils	Productivity enhancement/value addition (i.e. livestock, [illegible])	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, [illegible]	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops, trees or fish)	Savings and/or credit	Irrigation
	DASSA ZOUME	6	4	1	1	1	0	1	2	0	1	1	1	8	15	0
		11.8%	9.3%	2.2%	2.2%	2.3%	0.0%	2.3%	4.5%	0.0%	2.2%	2.1%	2.1%	17.4%	32.6%	0.0%
	DJOUGOU	13	1	1	1	1	2	0	5	0	0	0	0	15	9	0
		21.7%	1.9%	1.9%	1.9%	1.9%	3.9%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	30.0%	18.8%	0.0%
	OUAKE	23	12	6	18	2	9	17	14	3	0	8	3	36	13	1
		32.9%	18.8%	8.7%	28.1%	3.3%	14.3%	26.2%	21.9%	4.8%	0.0%	13.3%	5.1%	60.0%	21.3%	1.7%
	TCHAOUROU	6	2	2	3	7	2	1	8	1	2	3	3	22	22	1
		7.5%	2.7%	2.7%	4.1%	9.6%	2.8%	1.4%	10.8%	1.4%	2.8%	4.3%	4.2%	31.0%	29.3%	1.4%
Total		85	32	21	40	23	23	30	66	8	8	18	11	132	93	6
		18.8%	8.0%	4.9%	9.5%	5.6%	5.6%	7.3%	16.0%	2.0%	2.0%	4.5%	2.7%	32.3%	22.5%	1.5%

Annex 30: Membership in different association segregated by sex and municipality

Sex	Councils	Productivity enhancement/value addition (i.e. livestock, crops, trees or fish)	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, nuts, shea, neem	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops,	Savings and/or credit	Irrigation
Male	BANIKOARA	4	0	2	3	0	0	0	0	0	0	0	0	5	4	0
		11.8%	0.0%	5.7%	8.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.7%	11.4%	0.0%
	BOUKOMBE	8	6	3	3	6	4	5	12	2	3	3	3	13	6	2
		21.6%	16.7%	8.1%	8.6%	16.7%	11.1%	13.2%	32.4%	5.6%	8.6%	8.6%	8.3%	36.1%	16.7%	5.7%
	COBLY	12	2	2	3	4	3	4	9	0	0	1	0	15	7	1
		23.5%	5.0%	4.3%	6.5%	8.7%	6.5%	8.9%	19.6%	0.0%	0.0%	2.2%	0.0%	31.3%	15.2%	2.3%
	DASSA ZOUME	4	3	1	0	1	0	0	0	0	0	0	1	6	11	0
		10.3%	9.1%	2.8%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	17.1%	31.4%	0.0%
	DJOUGOU	13	1	1	1	1	2	0	5	0	0	0	0	13	6	0
		22.8%	2.0%	2.1%	2.0%	2.0%	4.1%	0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	27.7%	13.3%	0.0%
	OUAKE	16	9	4	14	1	3	14	10	2	0	7	3	26	7	1
		28.6%	18.0%	7.4%	28.0%	2.1%	6.4%	28.0%	20.8%	4.3%	0.0%	15.6%	6.7%	57.8%	15.2%	2.2%
	TCHAOUROU	6	2	2	3	7	2	1	6	1	2	3	3	19	17	1
		8.8%	3.1%	3.0%	4.7%	10.9%	3.2%	1.6%	9.4%	1.6%	3.2%	5.0%	4.8%	30.6%	26.2%	1.7%
Total		63	23	15	27	20	14	24	42	5	5	14	10	97	58	5
		18.4%	7.5%	4.7%	8.5%	6.5%	4.5%	7.7%	13.5%	1.6%	1.6%	4.6%	3.3%	31.6%	18.8%	1.7%

Sex	Councils	Productivity enhancement/value addition (i.e. livestock, crops, trees or fish)	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, nuts, shea, neem	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops,	Savings and/or credit	Irrigation
Female	BANIKOARA	0	0	0	1	0	0	0	1	0	0	0	0	5	7	0
		0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	0.0%	4.8%	0.0%	0.0%	0.0%	0.0%	25.0%	33.3%	0.0%
	BOUKOMBE	8	5	2	7	2	3	1	11	2	2	2	1	9	8	0
		25.0%	17.2%	6.5%	21.9%	6.3%	9.4%	3.1%	34.4%	6.3%	6.3%	6.3%	3.2%	28.1%	25.0%	0.0%
	COBLY	5	0	2	0	0	0	1	4	0	0	0	0	4	2	1
		35.7%	0.0%	16.7%	0.0%	0.0%	0.0%	8.3%	36.4%	0.0%	0.0%	0.0%	0.0%	33.3%	15.4%	9.1%
	DASSA ZOUME	2	1	0	1	0	0	1	2	0	1	1	0	2	4	0
		16.7%	10.0%	0.0%	11.1%	0.0%	0.0%	10.0%	20.0%	0.0%	9.1%	10.0%	0.0%	18.2%	36.4%	0.0%
	DJOUGOU	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.7%	100.0%	0.0%
	OUAKE	7	3	2	4	1	6	3	4	1	0	1	0	10	6	0
		50.0%	21.4%	13.3%	28.6%	7.1%	37.5%	20.0%	25.0%	6.7%	0.0%	6.7%	0.0%	66.7%	40.0%	0.0%
	TCHAOUROU	0	0	0	0	0	0	0	2	0	0	0	0	3	5	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	33.3%	50.0%	0.0%
Total		22	9	6	13	3	9	6	24	3	3	4	1	35	35	1
		20.2%	9.5%	5.8%	12.6%	3.0%	8.9%	5.8%	23.5%	3.0%	3.0%	4.0%	1.0%	34.3%	33.3%	1.0%
Total	BANIKOARA	4	0	2	4	0	0	0	1	0	0	0	0	10	11	0

Sex	Councils	Productivity enhancement/value addition (i.e. livestock, crops, trees or fish)	Sewing	Nursery/tree planting	Soil improvement activities	Beekeeping	Seed production	Vegetable production	Collection of forest products, exp . seeds, nuts, shea, neem	Ecotourism (Nature trails/walks, guides)	Fish/shrimp ponds	Introduction/crop substitution	Fishing	Commercialization of agricultural products (i.e. livestock, crops,	Savings and/or credit	Irrigation
		7.1%	0.0%	3.5%	6.9%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	18.5%	19.6%	0.0%
	BOUKOMBE	16	11	5	10	8	7	6	23	4	5	5	4	22	14	2
		23.2%	16.9%	7.4%	14.9%	11.8%	10.3%	8.6%	33.3%	5.9%	7.5%	7.5%	6.0%	32.4%	20.6%	3.0%
	COBLY	17	2	4	3	4	3	5	13	0	0	1	0	19	9	2
		26.2%	4.1%	6.9%	5.2%	6.9%	5.2%	8.8%	22.8%	0.0%	0.0%	1.8%	0.0%	31.7%	15.3%	3.6%
	DASSA ZOUME	6	4	1	1	1	0	1	2	0	1	1	1	8	15	0
		11.8%	9.3%	2.2%	2.2%	2.3%	0.0%	2.3%	4.5%	0.0%	2.2%	2.1%	2.1%	17.4%	32.6%	0.0%
	DJOUGOU	13	1	1	1	1	2	0	5	0	0	0	0	15	9	0
		21.7%	1.9%	1.9%	1.9%	1.9%	3.9%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	30.0%	18.8%	0.0%
	OUAKE	23	12	6	18	2	9	17	14	3	0	8	3	36	13	1
		32.9%	18.8%	8.7%	28.1%	3.3%	14.3%	26.2%	21.9%	4.8%	0.0%	13.3%	5.1%	60.0%	21.3%	1.7%
	TCHAOUROU	6	2	2	3	7	2	1	8	1	2	3	3	22	22	1
		7.5%	2.7%	2.7%	4.1%	9.6%	2.8%	1.4%	10.8%	1.4%	2.8%	4.3%	4.2%	31.0%	29.3%	1.4%
Total		85	32	21	40	23	23	30	66	8	8	18	11	132	93	6
		18.8%	8.0%	4.9%	9.5%	5.6%	5.6%	7.3%	16.0%	2.0%	2.0%	4.5%	2.7%	32.3%	22.5%	1.5%

Annex 31: Number and percentage of households having faced extreme climate hazard crisis segregated by group and municipality

Group	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
Control	BANIKOARA	11
		34.4%
	BOUKOMBE	15
		45.5%
	COBLY	12
		48.0%
	DASSA ZOUME	17
		44.7%
	DJOUGOU	11
		47.8%
	OUAKE	12
		41.4%
	TCHAOUROU	17
		60.7%
Total		95
		45.7%
Beneficiary	BANIKOARA	38
		57.6%
	BOUKOMBE	21

Group	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
		33.9%
	COBLY	29
		45.3%
	DASSA ZOUME	22
		34.4%
	DJOUGOU	26
		40.0%
	OUAKE	39
		56.5%
	TCHAOUROU	43
		62.3%
Total		218
		47.5%
	BANIKOARA	49
		50.0%
	BOUKOMBE	36
Total		37.9%
	COBLY	41
		46.1%
	DASSA ZOUME	39

Group	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
		38.2%
	DJOUGOU	37
		42.0%
	OUAKE	51
		52.0%
	TCHAOUROU	60
		61.9%
Total		313
		46.9%

Annex 32: Number and percentage of households having faced extreme climate hazard crisis segregated by sex and municipality

Sex	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
Male	BANIKOARA	33
		50.8%
	BOUKOMBE	19
		34.5%
	COBLY	31
		44.9%
	DASSA ZOUME	25
		33.8%
	DJOUGOU	36
		46.2%
	OUAKE	45
		57.0%
	TCHAOUROU	52
		63.4%
Total		241
		48.0%
Female	BANIKOARA	16
		48.5%
	BOUKOMBE	17

Sex	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
		42.5%
	COBLY	10
		50.0%
	DASSA ZOUME	14
		50.0%
	DJOUGOU	1
		10.0%
	OUAKE	6
		31.6%
	TCHAOUROU	8
		53.3%
Total		72
		43.6%
	BANIKOARA	49
		50.0%
	BOUKOMBE	36
Total		37.9%
	COBLY	41
		46.1%
	DASSA ZOUME	39

Sex	Councils	Proportion of households having faced a crisis linked to an extreme climate hazard (e.g. floods, drought, tidal waves)
		38.2%
	DJOUGOU	37
		42.0%
	OUAKE	51
		52.0%
	TCHAOUROU	60
		61.9%
Total		313
		46.9%

Annex 33: Sources of assistance in case of climate crises over the past five years segregated by group and municipality

Group	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
Control	BANIKOARA	5	0	0	2	0	0	3	1
		45.5%	0.0%	0.0%	18.2%	0.0%	0.0%	75.0%	25.0%
	BOUKOMBE	1	0	0	0	0	0	14	0
		6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	93.3%	0.0%
	COBLY	3	0	1	0	0	0	9	0
		25.0%	0.0%	8.3%	0.0%	0.0%	0.0%	100.0%	0.0%
	DASSA ZOUME	3	0	0	0	0	1	13	1
		17.6%	0.0%	0.0%	0.0%	0.0%	5.9%	92.9%	7.1%
	DJOUGOU	5	0	0	0	1	0	6	0
		45.5%	0.0%	0.0%	0.0%	9.1%	0.0%	54.5%	0.0%
	OUAKE	0	0	0	0	0	0	12	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
	TCHAOUROU	7	1	0	0	1	0	9	0
		41.2%	5.9%	0.0%	0.0%	5.9%	0.0%	52.9%	0.0%
Total		24	1	1	2	2	1	66	2
		25.3%	1.1%	1.1%	2.1%	2.1%	1.1%	80.5%	2.4%
Beneficiary	BANIKOARA	1	0	0	0	0	1	35	2
		2.6%	0.0%	0.0%	0.0%	0.0%	2.6%	92.1%	5.3%

Group	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
	BOUKOMBE	5	0	1	1	0	1	16	0
		23.8%	0.0%	4.8%	4.8%	0.0%	4.8%	100.0%	0.0%
	COBLY	5	1	1	2	1	3	21	1
		17.2%	3.4%	3.4%	6.9%	3.4%	10.3%	84.0%	4.0%
	DASSA ZOUME	3	0	0	3	0	0	16	0
		13.6%	0.0%	0.0%	13.6%	0.0%	0.0%	94.1%	0.0%
	DJOUGOU	1	0	0	0	0	0	25	0
		3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
	OUAKE	6	2	3	1	0	2	31	0
		15.4%	5.1%	7.7%	2.6%	0.0%	5.1%	93.9%	0.0%
	TCHAOUROU	19	0	0	2	1	1	20	2
		44.2%	0.0%	0.0%	4.7%	2.3%	2.3%	64.5%	6.5%
Total		40	3	5	9	2	8	164	5
		18.3%	1.4%	2.3%	4.1%	.9%	3.7%	88.6%	2.7%
Total	BANIKOARA	6	0	0	2	0	1	38	3
		12.2%	0.0%	0.0%	4.1%	0.0%	2.0%	90.5%	7.1%
	BOUKOMBE	6	0	1	1	0	1	30	0
		16.7%	0.0%	2.8%	2.8%	0.0%	2.8%	96.8%	0.0%
	COBLY	8	1	2	2	1	3	30	1

Group	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
		19.5%	2.4%	4.9%	4.9%	2.4%	7.3%	88.2%	2.9%
	DASSA ZOUME	6	0	0	3	0	1	29	1
		15.4%	0.0%	0.0%	7.7%	0.0%	2.6%	93.5%	3.2%
	DJOUGOU	6	0	0	0	1	0	31	0
		16.2%	0.0%	0.0%	0.0%	2.7%	0.0%	86.1%	0.0%
	OUAKE	6	2	3	1	0	2	43	0
		11.8%	3.9%	5.9%	2.0%	0.0%	3.9%	95.6%	0.0%
	TCHAOUROU	26	1	0	2	2	1	29	2
		43.3%	1.7%	0.0%	3.3%	3.3%	1.7%	60.4%	4.2%
Total		64	4	6	11	4	9	230	7
		20.4%	1.3%	1.9%	3.5%	1.3%	2.9%	86.1%	2.6%

Annex 34: Sources of assistance in case of climate crises over the past five years segregated by sex and municipality

Sex	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
Male	BANIKOARA	3	0	0	1	0	0	26	3
		9.1%	0.0%	0.0%	3.0%	0.0%	0.0%	89.7%	10.3%
	BOUKOMBE	6	0	1	1	0	1	13	0
		31.6%	0.0%	5.3%	5.3%	0.0%	5.3%	92.9%	0.0%
	COBLY	5	1	2	0	1	1	24	1
		16.1%	3.2%	6.5%	0.0%	3.2%	3.2%	88.9%	3.7%
	DASSA ZOUME	4	0	0	2	0	1	18	1
		16.0%	0.0%	0.0%	8.0%	0.0%	4.0%	90.0%	5.0%
	DJOUGOU	6	0	0	0	1	0	30	0
		16.7%	0.0%	0.0%	0.0%	2.8%	0.0%	85.7%	0.0%
	OUAKE	5	1	2	1	0	2	38	0
		11.1%	2.2%	4.4%	2.2%	0.0%	4.4%	95.0%	0.0%
	TCHAOUROU	23	1	0	2	2	1	24	2
		44.2%	1.9%	0.0%	3.8%	3.8%	1.9%	58.5%	4.9%
Total		52	3	5	7	4	6	173	7
		21.6%	1.2%	2.1%	2.9%	1.7%	2.5%	84.0%	3.4%
Female	BANIKOARA	3	0	0	1		1	12	
		18.8%	0.0%	0.0%	6.3%		6.3%	92.3%	

Sex	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
	BOUKOMBE	0	0	0	0		0	17	
		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	
	COBLY	3	0	0	2		2	6	
		30.0%	0.0%	0.0%	20.0%		20.0%	85.7%	
	DASSA ZOUME	2	0	0	1		0	11	
		14.3%	0.0%	0.0%	7.1%		0.0%	100.0%	
	DJOUGOU	0	0	0	0		0	1	
		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	
	OUAKE	1	1	1	0		0	5	
		16.7%	16.7%	16.7%	0.0%		0.0%	100.0%	
	TCHAOUROU	3	0	0	0		0	5	
		37.5%	0.0%	0.0%	0.0%		0.0%	71.4%	
Total		12	1	1	4		3	57	
		16.7%	1.4%	1.4%	5.6%		4.2%	93.4%	
Total	BANIKOARA	6	0	0	2	0	1	38	3
		12.2%	0.0%	0.0%	4.1%	0.0%	2.0%	90.5%	7.1%
	BOUKOMBE	6	0	1	1	0	1	30	0
		16.7%	0.0%	2.8%	2.8%	0.0%	2.8%	96.8%	0.0%
	COBLY	8	1	2	2	1	3	30	1

Sex	Councils	Friends, relatives, neighbors	Government agencies	Politicians	NGOs	Religious organizations	A local community group in which you are a member	None	Others
		19.5%	2.4%	4.9%	4.9%	2.4%	7.3%	88.2%	2.9%
	DASSA ZOUME	6	0	0	3	0	1	29	1
		15.4%	0.0%	0.0%	7.7%	0.0%	2.6%	93.5%	3.2%
	DJOUGOU	6	0	0	0	1	0	31	0
		16.2%	0.0%	0.0%	0.0%	2.7%	0.0%	86.1%	0.0%
	OUAKE	6	2	3	1	0	2	43	0
		11.8%	3.9%	5.9%	2.0%	0.0%	3.9%	95.6%	0.0%
	TCHAOUROU	26	1	0	2	2	1	29	2
		43.3%	1.7%	0.0%	3.3%	3.3%	1.7%	60.4%	4.2%
Total		64	4	6	11	4	9	230	7
		20.4%	1.3%	1.9%	3.5%	1.3%	2.9%	86.1%	2.6%

Annex 35: Major challenges faced by community forest and other social groups segregated by group and municipality

Group	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
Control	BANIKOARA	9	3	3	7	9	7	5	7
		28.1%	9.4%	9.4%	21.9%	28.1%	24.1%	15.6%	21.9%
	BOUKOMBE	10	10	9	10	14	11	7	14
		30.3%	30.3%	27.3%	30.3%	42.4%	34.4%	21.2%	42.4%
	COBLY	5	1	12	8	13	13	5	11
		20.0%	4.0%	48.0%	32.0%	52.0%	52.0%	20.0%	44.0%
	DASSA ZOUME	18	5	3	11	19	15	4	18
		47.4%	13.2%	7.9%	28.9%	50.0%	41.7%	10.5%	47.4%
	DJOUGOU	10	10	15	14	14	15	15	9
		43.5%	43.5%	65.2%	60.9%	60.9%	68.2%	65.2%	39.1%
	OUAKE	8	10	2	11	11	2	6	8
		27.6%	34.5%	6.9%	37.9%	37.9%	7.1%	20.7%	27.6%
	TCHAOUROU	26	12	11	18	19	13	12	11
		92.9%	42.9%	39.3%	64.3%	67.9%	48.1%	42.9%	39.3%
Total		86	51	55	79	99	76	54	78
		41.3%	24.5%	26.4%	38.0%	47.6%	38.2%	26.0%	37.5%
Beneficiary	BANIKOARA	18	3	3	9	23	17	2	28
		27.3%	4.5%	4.5%	13.6%	34.8%	25.8%	3.0%	42.4%

Group	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
	BOUKOMBE	14	7	18	9	26	12	7	27
		22.6%	11.3%	29.0%	14.5%	41.9%	21.4%	11.3%	43.5%
	COBLY	15	15	13	21	30	12	11	17
		23.4%	23.4%	20.3%	32.8%	46.9%	18.8%	17.2%	26.6%
	DASSA ZOUME	29	5	7	19	31	22	6	34
		45.3%	7.8%	10.9%	29.7%	48.4%	43.1%	9.4%	53.1%
	DJOUGOU	23	5	11	24	39	11	13	10
		35.4%	7.7%	16.9%	36.9%	60.0%	20.8%	20.0%	15.4%
	OUAKE	19	17	11	17	27	4	11	25
		27.5%	24.6%	15.9%	24.6%	39.1%	6.0%	15.9%	36.2%
	TCHAOUROU	43	30	34	30	46	29	33	37
		62.3%	43.5%	49.3%	43.5%	66.7%	43.9%	47.8%	53.6%
Total		161	82	97	129	222	107	83	178
		35.1%	17.9%	21.1%	28.1%	48.4%	25.3%	18.1%	38.8%
Total	BANIKOARA	27	6	6	16	32	24	7	35
		27.6%	6.1%	6.1%	16.3%	32.7%	25.3%	7.1%	35.7%
	BOUKOMBE	24	17	27	19	40	23	14	41
		25.3%	17.9%	28.4%	20.0%	42.1%	26.1%	14.7%	43.2%
	COBLY	20	16	25	29	43	25	16	28

Group	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
		22.5%	18.0%	28.1%	32.6%	48.3%	28.1%	18.0%	31.5%
	DASSA ZOUME	47	10	10	30	50	37	10	52
		46.1%	9.8%	9.8%	29.4%	49.0%	42.5%	9.8%	51.0%
	DJOUGOU	33	15	26	38	53	26	28	19
		37.5%	17.0%	29.5%	43.2%	60.2%	34.7%	31.8%	21.6%
	OUAKE	27	27	13	28	38	6	17	33
		27.6%	27.6%	13.3%	28.6%	38.8%	6.3%	17.3%	33.7%
	TCHAOUROU	69	42	45	48	65	42	45	48
		71.1%	43.3%	46.4%	49.5%	67.0%	45.2%	46.4%	49.5%
Total		247	133	152	208	321	183	137	256
		37.0%	19.9%	22.8%	31.2%	48.1%	29.4%	20.5%	38.4%

Annex 36: Major challenges faced by community forest and other social groups segregated by sex and municipality

Sex	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
Male	BANIKOARA	21	5	6	13	23	15	4	25
		32.3%	7.7%	9.2%	20.0%	35.4%	24.2%	6.2%	38.5%
	BOUKOMBE	14	8	11	8	20	9	6	25
		25.5%	14.5%	20.0%	14.5%	36.4%	18.4%	10.9%	45.5%
	COBLY	17	12	22	23	35	22	15	25
		24.6%	17.4%	31.9%	33.3%	50.7%	31.9%	21.7%	36.2%
	DASSA ZOUME	34	8	5	21	33	22	4	36
		45.9%	10.8%	6.8%	28.4%	44.6%	34.9%	5.4%	48.6%
	DJOUGOU	33	15	26	38	52	26	28	19
		42.3%	19.2%	33.3%	48.7%	66.7%	38.8%	35.9%	24.4%
	OUAKE	23	24	11	24	32	4	16	31
		29.1%	30.4%	13.9%	30.4%	40.5%	5.3%	20.3%	39.2%
	TCHAOUROU	59	35	38	41	55	36	38	40
		72.0%	42.7%	46.3%	50.0%	67.1%	45.6%	46.3%	48.8%
Total		201	107	119	168	250	134	111	201
		40.0%	21.3%	23.7%	33.5%	49.8%	28.8%	22.1%	40.0%
Female	BANIKOARA	6	1	0	3	9	9	3	10
		18.2%	3.0%	0.0%	9.1%	27.3%	27.3%	9.1%	30.3%

Sex	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
	BOUKOMBE	10	9	16	11	20	14	8	16
		25.0%	22.5%	40.0%	27.5%	50.0%	35.9%	20.0%	40.0%
	COBLY	3	4	3	6	8	3	1	3
		15.0%	20.0%	15.0%	30.0%	40.0%	15.0%	5.0%	15.0%
	DASSA ZOUME	13	2	5	9	17	15	6	16
		46.4%	7.1%	17.9%	32.1%	60.7%	62.5%	21.4%	57.1%
	DJOUGOU	0	0	0	0	1	0	0	0
		0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%
	OUAKE	4	3	2	4	6	2	1	2
		21.1%	15.8%	10.5%	21.1%	31.6%	10.5%	5.3%	10.5%
	TCHAOUROU	10	7	7	7	10	6	7	8
		66.7%	46.7%	46.7%	46.7%	66.7%	42.9%	46.7%	53.3%
Total		46	26	33	40	71	49	26	55
		27.9%	15.8%	20.0%	24.2%	43.0%	31.2%	15.8%	33.3%
Total	BANIKOARA	27	6	6	16	32	24	7	35
		27.6%	6.1%	6.1%	16.3%	32.7%	25.3%	7.1%	35.7%
	BOUKOMBE	24	17	27	19	40	23	14	41
		25.3%	17.9%	28.4%	20.0%	42.1%	26.1%	14.7%	43.2%
	COBLY	20	16	25	29	43	25	16	28

Sex	Councils	Illegal extraction	Poor leadership	Conflicting internal and external boundaries	Financial management challenges	Limited financial resources	Human-wildlife conflict	Inadequate patrols	Uncontrolled bushfires
		22.5%	18.0%	28.1%	32.6%	48.3%	28.1%	18.0%	31.5%
	DASSA ZOUME	47	10	10	30	50	37	10	52
		46.1%	9.8%	9.8%	29.4%	49.0%	42.5%	9.8%	51.0%
	DJOUGOU	33	15	26	38	53	26	28	19
		37.5%	17.0%	29.5%	43.2%	60.2%	34.7%	31.8%	21.6%
	OUAKE	27	27	13	28	38	6	17	33
		27.6%	27.6%	13.3%	28.6%	38.8%	6.3%	17.3%	33.7%
	TCHAOUROU	69	42	45	48	65	42	45	48
		71.1%	43.3%	46.4%	49.5%	67.0%	45.2%	46.4%	49.5%
Total		247	133	152	208	321	183	137	256
		37.0%	19.9%	22.8%	31.2%	48.1%	29.4%	20.5%	38.4%

Annex 37: Level of importance of the major challenges faced by community forest and other social groups segregated by group and municipality

Group	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
Control	BANIKOARA	3	6	1	2	2	1	0	7	2	7	0	7	1	4	5	2
		33.3%	66.7%	33.3%	66.7%	66.7%	33.3%	0.0%	100.0%	22.2%	77.8%	0.0%	100.0%	20.0%	80.0%	71.4%	28.6%
	BOUKOMBE	1	9	1	9	0	9	0	10	0	14	2	9	0	7	2	12
		10.0%	90.0%	10.0%	90.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	18.2%	81.8%	0.0%	100.0%	14.3%	85.7%
	COBLY	1	4	0	1	2	10	1	7	3	10	4	9	2	3	3	8
		20.0%	80.0%	0.0%	100.0%	16.7%	83.3%	12.5%	87.5%	23.1%	76.9%	30.8%	69.2%	40.0%	60.0%	27.3%	72.7%
	DASSA ZOUME	0	18	1	4	0	3	2	9	1	18	0	15	1	3	11	7
		0.0%	100.0%	20.0%	80.0%	0.0%	100.0%	18.2%	81.8%	5.3%	94.7%	0.0%	100.0%	25.0%	75.0%	61.1%	38.9%
	DJOUGOU	0	10	0	10	1	14	0	14	0	14	0	13	0	15	3	6
		0.0%	100.0%	0.0%	100.0%	6.7%	93.3%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	33.3%	66.7%
	OUAKE	0	8	3	7	1	1	4	7	4	7	1	1	0	6	5	3
		0.0%	100.0%	30.0%	70.0%	50.0%	50.0%	36.4%	63.6%	36.4%	63.6%	50.0%	50.0%	0.0%	100.0%	62.5%	37.5%
		1	24	1	11	0	11	5	13	4	15	1	12	0	12	6	5

Group	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	TCHAOUROU	4.0%	96.0%	8.3%	91.7%	0.0%	100.0%	27.8%	72.2%	21.1%	78.9%	7.7%	92.3%	0.0%	100.0%	54.5%	45.5%
Total		6	79	7	44	6	49	12	67	14	85	8	66	4	50	35	43
		7.1%	92.9%	13.7%	86.3%	10.9%	89.1%	15.2%	84.8%	14.1%	85.9%	10.8%	89.2%	7.4%	92.6%	44.9%	55.1%
Beneficiary	BANIKOARA	0	18	0	3	0	3	3	6	2	21	0	17	0	2	20	8
		0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	33.3%	66.7%	8.7%	91.3%	0.0%	100.0%	0.0%	100.0%	71.4%	28.6%
	BOUKOMBE	5	9	6	1	14	4	7	2	12	14	1	11	5	2	9	18
		35.7%	64.3%	85.7%	14.3%	77.8%	22.2%	77.8%	22.2%	46.2%	53.8%	8.3%	91.7%	71.4%	28.6%	33.3%	66.7%
	COBLY	1	14	4	11	6	7	11	10	10	20	2	10	1	10	5	12
		6.7%	93.3%	26.7%	73.3%	46.2%	53.8%	52.4%	47.6%	33.3%	66.7%	16.7%	83.3%	9.1%	90.9%	29.4%	70.6%
	DASSA ZOUME	4	23	1	4	1	6	0	19	6	25	1	21	0	6	23	11
		14.8%	85.2%	20.0%	80.0%	14.3%	85.7%	0.0%	100.0%	19.4%	80.6%	4.5%	95.5%	0.0%	100.0%	67.6%	32.4%
	DJOUGOU	2	20	1	4	3	8	2	22	2	37	2	9	1	12	2	8
		9.1%	90.9%	20.0%	80.0%	27.3%	72.7%	8.3%	91.7%	5.1%	94.9%	18.2%	81.8%	7.7%	92.3%	20.0%	80.0%

Group	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	OUAKE	10	8	6	11	4	7	3	14	6	21	0	4	3	8	7	18
		55.6%	44.4%	35.3%	64.7%	36.4%	63.6%	17.6%	82.4%	22.2%	77.8%	0.0%	100.0%	27.3%	72.7%	28.0%	72.0%
	TCHAOUROU	3	38	1	29	7	27	2	28	1	45	4	25	2	31	12	25
		7.3%	92.7%	3.3%	96.7%	20.6%	79.4%	6.7%	93.3%	2.2%	97.8%	13.8%	86.2%	6.1%	93.9%	32.4%	67.6%
Total		25	130	19	63	35	62	28	101	39	183	10	97	12	71	78	100
		16.1%	83.9%	23.2%	76.8%	36.1%	63.9%	21.7%	78.3%	17.6%	82.4%	9.3%	90.7%	14.5%	85.5%	43.8%	56.2%
Total	BANIKOARA	3	24	1	5	2	4	3	13	4	28	0	24	1	6	25	10
		11.1%	88.9%	16.7%	83.3%	33.3%	66.7%	18.8%	81.3%	12.5%	87.5%	0.0%	100.0%	14.3%	85.7%	71.4%	28.6%
	BOUKOMBE	6	18	7	10	14	13	7	12	12	28	3	20	5	9	11	30
		25.0%	75.0%	41.2%	58.8%	51.9%	48.1%	36.8%	63.2%	30.0%	70.0%	13.0%	87.0%	35.7%	64.3%	26.8%	73.2%
	COBLY	2	18	4	12	8	17	12	17	13	30	6	19	3	13	8	20
		10.0%	90.0%	25.0%	75.0%	32.0%	68.0%	41.4%	58.6%	30.2%	69.8%	24.0%	76.0%	18.8%	81.3%	28.6%	71.4%
		4	41	2	8	1	9	2	28	7	43	1	36	1	9	34	18

Group	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	DASSA ZOUME	8.9%	91.1%	20.0%	80.0%	10.0%	90.0%	6.7%	93.3%	14.0%	86.0%	2.7%	97.3%	10.0%	90.0%	65.4%	34.6%
	DJOUGOU	2	30	1	14	4	22	2	36	2	51	2	22	1	27	5	14
		6.3%	93.8%	6.7%	93.3%	15.4%	84.6%	5.3%	94.7%	3.8%	96.2%	8.3%	91.7%	3.6%	96.4%	26.3%	73.7%
	OUAKE	10	16	9	18	5	8	7	21	10	28	1	5	3	14	12	21
		38.5%	61.5%	33.3%	66.7%	38.5%	61.5%	25.0%	75.0%	26.3%	73.7%	16.7%	83.3%	17.6%	82.4%	36.4%	63.6%
	TCHAOUROU	4	62	2	40	7	38	7	41	5	60	5	37	2	43	18	30
		6.1%	93.9%	4.8%	95.2%	15.6%	84.4%	14.6%	85.4%	7.7%	92.3%	11.9%	88.1%	4.4%	95.6%	37.5%	62.5%
Total		31	209	26	107	41	111	40	168	53	268	18	163	16	121	113	143
		12.9%	87.1%	19.5%	80.5%	27.0%	73.0%	19.2%	80.8%	16.5%	83.5%	9.9%	90.1%	11.7%	88.3%	44.1%	55.9%

Annex 38: Level of importance of the major challenges faced by community forest and other social groups segregated by sex and municipality

Sex	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
Male	BANIKOARA	2	19	0	5	2	4	3	10	4	19	0	15	1	3	18	7
		9.5%	90.5%	0.0%	100.0%	33.3%	66.7%	23.1%	76.9%	17.4%	82.6%	0.0%	100.0%	25.0%	75.0%	72.0%	28.0%
	BOUKOMBE	5	9	5	3	7	4	5	3	8	12	1	8	2	4	8	17
		35.7%	64.3%	62.5%	37.5%	63.6%	36.4%	62.5%	37.5%	40.0%	60.0%	11.1%	88.9%	33.3%	66.7%	32.0%	68.0%
	COBLY	1	16	2	10	6	16	9	14	12	23	4	18	3	12	7	18
		5.9%	94.1%	16.7%	83.3%	27.3%	72.7%	39.1%	60.9%	34.3%	65.7%	18.2%	81.8%	20.0%	80.0%	28.0%	72.0%
	DASSA ZOUME	4	28	2	6	0	5	1	20	5	28	1	21	0	4	23	13
		12.5%	87.5%	25.0%	75.0%	0.0%	100.0%	4.8%	95.2%	15.2%	84.8%	4.5%	95.5%	0.0%	100.0%	63.9%	36.1%
	DJOUGOU	2	30	1	14	4	22	2	36	2	50	2	22	1	27	5	14
		6.3%	93.8%	6.7%	93.3%	15.4%	84.6%	5.3%	94.7%	3.8%	96.2%	8.3%	91.7%	3.6%	96.4%	26.3%	73.7%
	OUAKE	9	13	7	17	4	7	5	19	6	26	0	4	3	13	12	19
		40.9%	59.1%	29.2%	70.8%	36.4%	63.6%	20.8%	79.2%	18.8%	81.3%	0.0%	100.0%	18.8%	81.3%	38.7%	61.3%
		4	53	2	33	7	31	6	35	5	50	5	31	2	36	14	26

Sex	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	TCHAOUROU	7.0%	93.0%	5.7%	94.3%	18.4%	81.6%	14.6%	85.4%	9.1%	90.9%	13.9%	86.1%	5.3%	94.7%	35.0%	65.0%
Total		27	168	19	88	30	89	31	137	42	208	13	119	12	99	87	114
		13.8%	86.2%	17.8%	82.2%	25.2%	74.8%	18.5%	81.5%	16.8%	83.2%	9.8%	90.2%	10.8%	89.2%	43.3%	56.7%
Female	BANIKOARA	1	5	1	0			0	3	0	9	0	9	0	3	7	3
		16.7%	83.3%	100.0%	0.0%			0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	70.0%	30.0%
	BOUKOMBE	1	9	2	7	7	9	2	9	4	16	2	12	3	5	3	13
		10.0%	90.0%	22.2%	77.8%	43.8%	56.3%	18.2%	81.8%	20.0%	80.0%	14.3%	85.7%	37.5%	62.5%	18.8%	81.3%
	COBLY	1	2	2	2	2	1	3	3	1	7	2	1	0	1	1	2
		33.3%	66.7%	50.0%	50.0%	66.7%	33.3%	50.0%	50.0%	12.5%	87.5%	66.7%	33.3%	0.0%	100.0%	33.3%	66.7%
	DASSA ZOUME	0	13	0	2	1	4	1	8	2	15	0	15	1	5	11	5
		0.0%	100.0%	0.0%	100.0%	20.0%	80.0%	11.1%	88.9%	11.8%	88.2%	0.0%	100.0%	16.7%	83.3%	68.8%	31.3%
	DJOUGOU									0	1						
										0.0%	100.0%						

Sex	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	OUAKE	1	3	2	1	1	1	2	2	4	2	1	1	0	1	0	2
		25.0%	75.0%	66.7%	33.3%	50.0%	50.0%	50.0%	50.0%	66.7%	33.3%	50.0%	50.0%	0.0%	100.0%	0.0%	100.0%
	TCHAOUROU	0	9	0	7	0	7	1	6	0	10	0	6	0	7	4	4
		0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	14.3%	85.7%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	50.0%	50.0%
Total		4	41	7	19	11	22	9	31	11	60	5	44	4	22	26	29
		8.9%	91.1%	26.9%	73.1%	33.3%	66.7%	22.5%	77.5%	15.5%	84.5%	10.2%	89.8%	15.4%	84.6%	47.3%	52.7%
Total	BANIKOARA	3	24	1	5	2	4	3	13	4	28	0	24	1	6	25	10
		11.1%	88.9%	16.7%	83.3%	33.3%	66.7%	18.8%	81.3%	12.5%	87.5%	0.0%	100.0%	14.3%	85.7%	71.4%	28.6%
	BOUKOMBE	6	18	7	10	14	13	7	12	12	28	3	20	5	9	11	30
		25.0%	75.0%	41.2%	58.8%	51.9%	48.1%	36.8%	63.2%	30.0%	70.0%	13.0%	87.0%	35.7%	64.3%	26.8%	73.2%
	COBLY	2	18	4	12	8	17	12	17	13	30	6	19	3	13	8	20
		10.0%	90.0%	25.0%	75.0%	32.0%	68.0%	41.4%	58.6%	30.2%	69.8%	24.0%	76.0%	18.8%	81.3%	28.6%	71.4%
		4	41	2	8	1	9	2	28	7	43	1	36	1	9	34	18

Sex	Councils	Illegal extraction		Poor leadership		Conflicting internal and external boundaries		Financial management challenges		Limited financial resources		Human-wildlife conflict		Inadequate patrols		Uncontrolled bushfires	
		Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
	DASSA ZOUME	8.9%	91.1%	20.0%	80.0%	10.0%	90.0%	6.7%	93.3%	14.0%	86.0%	2.7%	97.3%	10.0%	90.0%	65.4%	34.6%
	DJOUGOU	2	30	1	14	4	22	2	36	2	51	2	22	1	27	5	14
		6.3%	93.8%	6.7%	93.3%	15.4%	84.6%	5.3%	94.7%	3.8%	96.2%	8.3%	91.7%	3.6%	96.4%	26.3%	73.7%
	OUAKE	10	16	9	18	5	8	7	21	10	28	1	5	3	14	12	21
		38.5%	61.5%	33.3%	66.7%	38.5%	61.5%	25.0%	75.0%	26.3%	73.7%	16.7%	83.3%	17.6%	82.4%	36.4%	63.6%
	TCHAOUROU	4	62	2	40	7	38	7	41	5	60	5	37	2	43	18	30
		6.1%	93.9%	4.8%	95.2%	15.6%	84.4%	14.6%	85.4%	7.7%	92.3%	11.9%	88.1%	4.4%	95.6%	37.5%	62.5%
Total		31	209	26	107	41	111	40	168	53	268	18	163	16	121	113	143
		12.9%	87.1%	19.5%	80.5%	27.0%	73.0%	19.2%	80.8%	16.5%	83.5%	9.9%	90.1%	11.7%	88.3%	44.1%	55.9%

Annex 39: Participation in EbA related trainings or tools segregated by group and municipality

Group	Councils	1 to 3 times	4 to 6 times	more than 6 times
Control	BANIKOARA	1	1	1
		33.3%	33.3%	33.3%
	BOUKOMBE	4	1	0
		80.0%	20.0%	0.0%
	COBLY	2	1	1
		50.0%	25.0%	25.0%
	OUAKE	3	2	0
		60.0%	40.0%	0.0%
Total		10	5	2
		58.8%	29.4%	11.8%
Beneficiary	BOUKOMBE	5	2	1
		62.5%	25.0%	12.5%
	COBLY	0	2	0
		0.0%	100.0%	0.0%
	DASSA ZOUME	4	0	1
		80.0%	0.0%	20.0%
	DJOUGOU	3	4	0
		42.9%	57.1%	0.0%
	OUAKE	8	1	0
		88.9%	11.1%	0.0%

Group	Councils	1 to 3 times	4 to 6 times	more than 6 times
	TCHAOUROU	2	2	0
		50.0%	50.0%	0.0%
Total		22	11	2
		62.9%	31.4%	5.7%
Total	BANIKOARA	1	1	1
		33.3%	33.3%	33.3%
	BOUKOMBE	9	3	1
		69.2%	23.1%	7.7%
	COBLY	2	3	1
		33.3%	50.0%	16.7%
	DASSA ZOUME	4	0	1
		80.0%	0.0%	20.0%
	DJOUGOU	3	4	0
		42.9%	57.1%	0.0%
	OUAKE	11	3	0
		78.6%	21.4%	0.0%
	TCHAOUROU	2	2	0
		50.0%	50.0%	0.0%
Total		32	16	4
		61.5%	30.8%	7.7%

Annex 40: Participation in EbA related trainings or tools segregated by sex and municipality

Sex	Councils	1 to 3 times	4 to 6 times	more than 6 times
Male	BANIKOARA	1	1	1
		33.3%	33.3%	33.3%
	BOUKOMBE	3	2	0
		60.0%	40.0%	0.0%
	COBLY	2	1	0
		66.7%	33.3%	0.0%
	DASSA ZOUME	4	0	1
		80.0%	0.0%	20.0%
	DJOUGOU	3	4	0
		42.9%	57.1%	0.0%
	OUAKE	7	3	0
		70.0%	30.0%	0.0%
	TCHAOUROU	1	2	0
		33.3%	66.7%	0.0%
Total		21	13	2
		58.3%	36.1%	5.6%
Female	BOUKOMBE	6	1	1
		75.0%	12.5%	12.5%
	COBLY	0	2	1
		0.0%	66.7%	33.3%

Sex	Councils	1 to 3 times	4 to 6 times	more than 6 times
	OUAKE	4	0	0
		100.0%	0.0%	0.0%
	TCHAOUROU	1	0	0
		100.0%	0.0%	0.0%
Total		11	3	2
		68.8%	18.8%	12.5%
Total	BANIKOARA	1	1	1
		33.3%	33.3%	33.3%
	BOUKOMBE	9	3	1
		69.2%	23.1%	7.7%
	COBLY	2	3	1
		33.3%	50.0%	16.7%
	DASSA ZOUME	4	0	1
		80.0%	0.0%	20.0%
	DJOUGOU	3	4	0
		42.9%	57.1%	0.0%
	OUAKE	11	3	0
		78.6%	21.4%	0.0%
	TCHAOUROU	2	2	0
		50.0%	50.0%	0.0%
Total		32	16	4

Sex	Councils	1 to 3 times	4 to 6 times	more than 6 times
		61.5%	30.8%	7.7%

Annex 41: Participation in trainings on nature-based adaptation in the past year segregated by group and municipality

Group	Councils	1 to 3	4 to 6	More than 6
Control	BANIKOARA	3	0	0
		9.4%	0.0%	0.0%
	BOUKOMBE	2	1	0
		6.1%	3.0%	0.0%
	COBLY	2	1	1
		8.0%	4.0%	4.0%
	DASSA ZOUME	1	0	0
		2.6%	0.0%	0.0%
	DJOUGOU	0	0	0
		0.0%	0.0%	0.0%
	OUAKE	6	0	0
		20.7%	0.0%	0.0%
	TCHAOUROU	0	0	0
		0.0%	0.0%	0.0%
Total		14	2	1
		6.7%	1.0%	.5%
Beneficiary	BANIKOARA	0	0	0
		0.0%	0.0%	0.0%
	BOUKOMBE	2	3	1
		3.2%	4.8%	1.6%

Group	Councils	1 to 3	4 to 6	More than 6
	COBLY	1	1	0
		1.6%	1.6%	0.0%
	DASSA ZOUME	6	0	0
		9.4%	0.0%	0.0%
	DJOUGOU	4	4	0
		6.2%	6.2%	0.0%
	OUAKE	8	0	0
		11.6%	0.0%	0.0%
	TCHAOUROU	2	0	0
		2.9%	0.0%	0.0%
Total		23	8	1
		5.0%	1.7%	.2%
Total	BANIKOARA	3	0	0
		3.1%	0.0%	0.0%
	BOUKOMBE	4	4	1
		4.2%	4.2%	1.1%
	COBLY	3	2	1
		3.4%	2.2%	1.1%
	DASSA ZOUME	7	0	0
		6.9%	0.0%	0.0%
	DJOUGOU	4	4	0

Group	Councils	1 to 3	4 to 6	More than 6
		4.5%	4.5%	0.0%
	OUAKE	14	0	0
		14.3%	0.0%	0.0%
	TCHAOUROU	2	0	0
		2.1%	0.0%	0.0%
Total		37	10	2
		5.5%	1.5%	.3%

Annex 42: Participation in trainings on nature-based adaptation in the past year segregated by sex and municipality

Sex	Councils	1 to 3	4 to 6	More than 6
Male	BANIKOARA	3	0	0
		4.6%	0.0%	0.0%
	BOUKOMBE	1	1	1
		1.8%	1.8%	1.8%
	COBLY	3	1	0
		4.3%	1.4%	0.0%
	DASSA ZOUME	7	0	0
		9.5%	0.0%	0.0%
	DJOUGOU	4	4	0
		5.1%	5.1%	0.0%
	OUAKE	12	0	0
		15.2%	0.0%	0.0%
	TCHAOUROU	2	0	0
		2.4%	0.0%	0.0%
Total		32	6	1
		6.4%	1.2%	.2%
Female	BANIKOARA	0	0	0
		0.0%	0.0%	0.0%
	BOUKOMBE	3	3	0
		7.5%	7.5%	0.0%

Sex	Councils	1 to 3	4 to 6	More than 6
	COBLY	0	1	1
		0.0%	5.0%	5.0%
	DASSA ZOUME	0	0	0
		0.0%	0.0%	0.0%
	DJOUGOU	0	0	0
		0.0%	0.0%	0.0%
	OUAKE	2	0	0
		10.5%	0.0%	0.0%
	TCHAOUROU	0	0	0
		0.0%	0.0%	0.0%
Total		5	4	1
		3.0%	2.4%	.6%
Total	BANIKOARA	3	0	0
		3.1%	0.0%	0.0%
	BOUKOMBE	4	4	1
		4.2%	4.2%	1.1%
	COBLY	3	2	1
		3.4%	2.2%	1.1%
	DASSA ZOUME	7	0	0
		6.9%	0.0%	0.0%
	DJOUGOU	4	4	0

Sex	Councils	1 to 3	4 to 6	More than 6
		4.5%	4.5%	0.0%
	OUAKE	14	0	0
		14.3%	0.0%	0.0%
	TCHAOUROU	2	0	0
		2.1%	0.0%	0.0%
Total		37	10	2
		5.5%	1.5%	.3%

Annex 43: Other training topics segregated by group and municipality

Group	Councils	Health care e.g. mother care	Sanitation	Financial management and entrepreneurship	Adding value to agricultural products	Sewing	Others
Control	BANIKOARA	5	2	6	4	0	0
		33.3%	13.3%	40.0%	26.7%	0.0%	0.0%
	BOUKOMBE	2	1	1	2	1	5
		6.7%	3.3%	3.3%	6.7%	3.3%	16.7%
	COBLY	1	0	1	4	0	0
		6.3%	0.0%	6.3%	25.0%	0.0%	0.0%
	DASSA ZOUME	0	0	1	1	0	1
		0.0%	0.0%	6.3%	6.3%	0.0%	6.3%
	DJOUGOU	0	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	OUAKE	1	4	4	6	0	0
		6.3%	25.0%	25.0%	37.5%	0.0%	0.0%
	TCHAOUROU	2	0	2	2	0	2
		10.0%	0.0%	10.0%	10.0%	0.0%	10.0%
Total		11	7	15	19	1	8
		9.1%	5.8%	12.4%	15.7%	.8%	6.6%
Beneficiary	BANIKOARA	0	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

	BOUKOMBE	9	9	8	8	8	7
		16.4%	16.4%	14.5%	14.5%	14.5%	12.7%
	COBLY	3	1	3	9	1	1
		5.5%	1.8%	5.5%	16.4%	1.8%	1.8%
	DASSA ZOUME	1	0	1	4	0	1
		6.7%	0.0%	6.7%	26.7%	0.0%	6.7%
	DJOUGOU	1	1	2	4	1	4
		11.1%	11.1%	22.2%	44.4%	11.1%	44.4%
	OUAKE	0	2	3	5	1	0
		0.0%	6.9%	10.3%	17.2%	3.4%	0.0%
	TCHAOUROU	3	0	2	1	0	1
		5.1%	0.0%	3.4%	1.7%	0.0%	1.7%
Total		17	13	19	31	11	14
		7.5%	5.7%	8.4%	13.7%	4.8%	6.2%
Total	BANIKOARA	5	2	6	4	0	0
		25.0%	10.0%	30.0%	20.0%	0.0%	0.0%
	BOUKOMBE	11	10	9	10	9	12
		12.9%	11.8%	10.6%	11.8%	10.6%	14.1%
	COBLY	4	1	4	13	1	1
		5.6%	1.4%	5.6%	18.3%	1.4%	1.4%
	DASSA ZOUME	1	0	2	5	0	2
		3.2%	0.0%	6.5%	16.1%	0.0%	6.5%

	DJOUGOU	1	1	2	4	1	4
		5.9%	5.9%	11.8%	23.5%	5.9%	23.5%
	OUAKE	1	6	7	11	1	0
		2.2%	13.3%	15.6%	24.4%	2.2%	0.0%
	TCHAOUROU	5	0	4	3	0	3
		6.3%	0.0%	5.1%	3.8%	0.0%	3.8%
Total		28	20	34	50	12	22
		8.0%	5.7%	9.8%	14.4%	3.4%	6.3%

Annex 44: Other training topics segregated by sex and municipality

Sex	Councils	Health care e.g. mother care	Sanitation	Financial management and entrepreneurship	Adding value to agricultural products	Sewing	Others
Male	BANIKOARA	1	0	0	3	0	0
		12.5%	0.0%	0.0%	37.5%	0.0%	0.0%
	BOUKOMBE	6	5	4	6	5	4
		12.5%	10.4%	8.3%	12.5%	10.4%	8.3%
	COBLY	2	0	2	8	0	0
		3.7%	0.0%	3.7%	14.8%	0.0%	0.0%
	DASSA ZOUME	1	0	1	5	0	2
		4.5%	0.0%	4.5%	22.7%	0.0%	9.1%
	DJOUGOU	1	1	2	4	1	4
		5.9%	5.9%	11.8%	23.5%	5.9%	23.5%
	OUAKE	0	6	5	8	1	0
		0.0%	18.2%	15.2%	24.2%	3.0%	0.0%
	TCHAOUROU	3	0	2	3	0	3
		4.6%	0.0%	3.1%	4.6%	0.0%	4.6%
Total		14	12	16	37	7	13
		5.7%	4.9%	6.5%	15.0%	2.8%	5.3%
Female	BANIKOARA	4	2	6	1	0	0
		33.3%	16.7%	50.0%	8.3%	0.0%	0.0%

Sex	Councils	Health care e.g. mother care	Sanitation	Financial management and entrepreneurship	Adding value to agricultural products	Sewing	Others
	BOUKOMBE	5	5	5	4	4	8
		13.5%	13.5%	13.5%	10.8%	10.8%	21.6%
	COBLY	2	1	2	5	1	1
		11.8%	5.9%	11.8%	29.4%	5.9%	5.9%
	DASSA ZOUME	0	0	1	0	0	0
		0.0%	0.0%	11.1%	0.0%	0.0%	0.0%
	OUAKE	1	0	2	3	0	0
		8.3%	0.0%	16.7%	25.0%	0.0%	0.0%
	TCHAOUROU	2	0	2	0	0	0
		14.3%	0.0%	14.3%	0.0%	0.0%	0.0%
Total		14	8	18	13	5	9
		13.9%	7.9%	17.8%	12.9%	5.0%	8.9%
Total	BANIKOARA	5	2	6	4	0	0
		25.0%	10.0%	30.0%	20.0%	0.0%	0.0%
	BOUKOMBE	11	10	9	10	9	12
		12.9%	11.8%	10.6%	11.8%	10.6%	14.1%
	COBLY	4	1	4	13	1	1
		5.6%	1.4%	5.6%	18.3%	1.4%	1.4%
	DASSA ZOUME	1	0	2	5	0	2

Sex	Councils	Health care e.g. mother care	Sanitation	Financial management and entrepreneurship	Adding value to agricultural products	Sewing	Others
		3.2%	0.0%	6.5%	16.1%	0.0%	6.5%
	DJOUGOU	1	1	2	4	1	4
		5.9%	5.9%	11.8%	23.5%	5.9%	23.5%
	OUAKE	1	6	7	11	1	0
		2.2%	13.3%	15.6%	24.4%	2.2%	0.0%
	TCHAOUROU	5	0	4	3	0	3
		6.3%	0.0%	5.1%	3.8%	0.0%	3.8%
Total		28	20	34	50	12	22
		8.0%	5.7%	9.8%	14.4%	3.4%	6.3%

Annex 45: Family benefits received from the community group segregated by group and municipality

Group	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
Control	BANIKOARA	12	4	6	1	2	1	8
		52.2%	17.4%	26.1%	4.3%	8.7%	4.3%	53.3%
	BOUKOMBE	13	3	4	0	4	0	17
		40.6%	9.4%	12.5%	0.0%	12.5%	0.0%	56.7%
	COBLY	4	0	4	1	10	0	6
		21.1%	0.0%	21.1%	5.3%	52.6%	0.0%	66.7%
	DASSA ZOUME	12	10	10	5	2	2	9
		52.2%	43.5%	43.5%	21.7%	8.7%	8.7%	56.3%
	DJOUGOU	0	0	6	0	0	0	2
		0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	25.0%
	OUAKE	0	2	0	0	0	0	9
		0.0%	18.2%	0.0%	0.0%	0.0%	0.0%	81.8%
	TCHAOUROU	5	0	8	0	1	0	8
		25.0%	0.0%	40.0%	0.0%	5.0%	0.0%	40.0%
Total		46	19	38	7	19	3	59
		33.8%	14.0%	27.9%	5.1%	14.0%	2.2%	54.1%
Beneficiary	BANIKOARA	1	1	1	0	0	0	11
		8.3%	8.3%	8.3%	0.0%	0.0%	0.0%	91.7%

Group	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
	BOUKOMBE	16	9	11	11	10	8	42
		25.8%	14.5%	17.7%	17.7%	16.1%	12.9%	89.4%
	COBLY	14	10	15	7	10	6	31
		23.7%	16.9%	25.4%	11.9%	16.9%	10.2%	58.5%
	DASSA ZOUME	6	1	5	11	17	1	9
		14.3%	2.4%	11.9%	26.2%	40.5%	2.4%	64.3%
	DJOUGOU	0	0	1	0	0	0	1
		0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	100.0%
	OUAKE	4	1	3	2	13	0	6
		15.4%	3.8%	11.5%	7.7%	50.0%	0.0%	31.6%
	TCHAOUROU	11	7	19	3	6	3	32
		15.9%	10.1%	27.5%	4.3%	8.7%	4.3%	68.1%
Total		52	29	55	34	56	18	132
		19.1%	10.7%	20.2%	12.5%	20.6%	6.6%	68.4%
Total	BANIKOARA	13	5	7	1	2	1	19
		37.1%	14.3%	20.0%	2.9%	5.7%	2.9%	70.4%
	BOUKOMBE	29	12	15	11	14	8	59
		30.9%	12.8%	16.0%	11.7%	14.9%	8.5%	76.6%
	COBLY	18	10	19	8	20	6	37

Group	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
		23.1%	12.8%	24.4%	10.3%	25.6%	7.7%	59.7%
	DASSA ZOUME	18	11	15	16	19	3	18
		27.7%	16.9%	23.1%	24.6%	29.2%	4.6%	60.0%
	DJOUGOU	0	0	7	0	0	0	3
		0.0%	0.0%	70.0%	0.0%	0.0%	0.0%	33.3%
	OUAKE	4	3	3	2	13	0	15
		10.8%	8.1%	8.1%	5.4%	35.1%	0.0%	50.0%
	TCHAOUROU	16	7	27	3	7	3	40
		18.0%	7.9%	30.3%	3.4%	7.9%	3.4%	59.7%
Total		98	48	93	41	75	21	191
		24.0%	11.8%	22.8%	10.0%	18.4%	5.1%	63.2%

Annex 46: Family benefits received from the community group segregated by sex and municipality

Sex	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
Male	BANIKOARA	6	1	2	0	0	0	11
		33.3%	5.6%	11.1%	0.0%	0.0%	0.0%	84.6%
	BOUKOMBE	15	6	7	8	9	5	36
		27.8%	11.1%	13.0%	14.8%	16.7%	9.3%	85.7%
	COBLY	9	5	11	3	15	3	30
		15.5%	8.6%	19.0%	5.2%	25.9%	5.2%	62.5%
	DASSA ZOUME	14	7	10	13	14	2	12
		30.4%	15.2%	21.7%	28.3%	30.4%	4.3%	57.1%
	DJOUGOU	0	0	7	0	0	0	3
		0.0%	0.0%	70.0%	0.0%	0.0%	0.0%	33.3%
	OUAKE	4	0	2	2	8	0	10
		16.7%	0.0%	8.3%	8.3%	33.3%	0.0%	55.6%
	TCHAOUROU	12	7	24	3	7	3	32
		16.2%	9.5%	32.4%	4.1%	9.5%	4.1%	60.4%
Total		60	26	63	29	53	13	134
		21.1%	9.2%	22.2%	10.2%	18.7%	4.6%	65.7%
Female	BANIKOARA	7	4	5	1	2	1	8
		41.2%	23.5%	29.4%	5.9%	11.8%	5.9%	57.1%

Sex	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
	BOUKOMBE	14	6	8	3	5	3	23
		35.0%	15.0%	20.0%	7.5%	12.5%	7.5%	65.7%
	COBLY	9	5	8	5	5	3	7
		45.0%	25.0%	40.0%	25.0%	25.0%	15.0%	50.0%
	DASSA ZOUME	4	4	5	3	5	1	6
		21.1%	21.1%	26.3%	15.8%	26.3%	5.3%	66.7%
	OUAKE	0	3	1	0	5	0	5
		0.0%	23.1%	7.7%	0.0%	38.5%	0.0%	41.7%
	TCHAOUROU	4	0	3	0	0	0	8
		26.7%	0.0%	20.0%	0.0%	0.0%	0.0%	57.1%
Total		38	22	30	12	22	8	57
		30.6%	17.7%	24.2%	9.7%	17.7%	6.5%	58.2%
Total	BANIKOARA	13	5	7	1	2	1	19
		37.1%	14.3%	20.0%	2.9%	5.7%	2.9%	70.4%
	BOUKOMBE	29	12	15	11	14	8	59
		30.9%	12.8%	16.0%	11.7%	14.9%	8.5%	76.6%
	COBLY	18	10	19	8	20	6	37
		23.1%	12.8%	24.4%	10.3%	25.6%	7.7%	59.7%
	DASSA ZOUME	18	11	15	16	19	3	18

Sex	Councils	Credit and loan facilities	Informal and formal employment opportunities	Food supplies e.g. fruits	Extension services	Tree seedlings	Assets exp. livestock	Others
		27.7%	16.9%	23.1%	24.6%	29.2%	4.6%	60.0%
	DJOUGOU	0	0	7	0	0	0	3
		0.0%	0.0%	70.0%	0.0%	0.0%	0.0%	33.3%
	OUAKE	4	3	3	2	13	0	15
		10.8%	8.1%	8.1%	5.4%	35.1%	0.0%	50.0%
	TCHAOUROU	16	7	27	3	7	3	40
		18.0%	7.9%	30.3%	3.4%	7.9%	3.4%	59.7%
Total		98	48	93	41	75	21	191
		24.0%	11.8%	22.8%	10.0%	18.4%	5.1%	63.2%

Annex 47: Need training aspects of arboriculture segregated by group and municipality

Group	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
Control	BANIKOARA	9	14	7	5	6
		37.5%	58.3%	29.2%	20.8%	25.0%
	BOUKOMBE	18	22	9	10	2
		58.1%	71.0%	29.0%	32.3%	6.5%
	COBLY	7	13	10	14	2
		46.7%	86.7%	66.7%	93.3%	13.3%
	DASSA ZOUME	7	18	5	6	5
		22.6%	58.1%	16.1%	19.4%	16.1%
	DJOUGOU	12	19	16	18	1
		52.2%	82.6%	69.6%	78.3%	4.3%
	OUAKE	13	24	10	13	2
		46.4%	85.7%	35.7%	46.4%	7.1%
	TCHAOUROU	8	27	25	11	0
		28.6%	96.4%	89.3%	39.3%	0.0%
Total		74	137	82	77	18
		41.1%	76.1%	45.6%	42.8%	10.0%
Beneficiary	BANIKOARA	9	22	8	6	21
		13.8%	33.8%	12.3%	9.2%	32.3%
	BOUKOMBE	27	21	10	19	6
		61.4%	47.7%	22.7%	43.2%	13.6%

Group	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
	COBLY	23	50	15	18	0
		40.4%	87.7%	26.3%	31.6%	0.0%
	DASSA ZOUME	14	20	8	14	5
		42.4%	60.6%	24.2%	42.4%	15.2%
	DJOUGOU	17	37	41	26	3
		26.6%	57.8%	64.1%	40.6%	4.7%
	OUAKE	32	35	21	35	20
		59.3%	64.8%	38.9%	64.8%	37.0%
	TCHAOUROU	23	36	23	22	4
		50.0%	78.3%	50.0%	47.8%	8.7%
Total		145	221	126	140	59
		39.9%	60.9%	34.7%	38.6%	16.3%
Total	BANIKOARA	18	36	15	11	27
		20.2%	40.4%	16.9%	12.4%	30.3%
	BOUKOMBE	45	43	19	29	8
		60.0%	57.3%	25.3%	38.7%	10.7%
	COBLY	30	63	25	32	2
		41.7%	87.5%	34.7%	44.4%	2.8%
	DASSA ZOUME	21	38	13	20	10
		32.8%	59.4%	20.3%	31.3%	15.6%
	DJOUGOU	29	56	57	44	4

Group	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
		33.3%	64.4%	65.5%	50.6%	4.6%
	OUAKE	45	59	31	48	22
		54.9%	72.0%	37.8%	58.5%	26.8%
	TCHAOUROU	31	63	48	33	4
		41.9%	85.1%	64.9%	44.6%	5.4%
Total		219	358	208	217	77
		40.3%	65.9%	38.3%	40.0%	14.2%

Annex 48: Need training aspects of arboriculture segregated by sex and municipality

Sex	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
Masculin	BANIKOARA	12	20	7	6	21
		20.0%	33.3%	11.7%	10.0%	35.0%
	BOUKOMBE	23	23	9	17	4
		57.5%	57.5%	22.5%	42.5%	10.0%
	COBLY	25	52	22	27	2
		43.1%	89.7%	37.9%	46.6%	3.4%
	DASSA ZOUME	20	30	11	15	8
		43.5%	65.2%	23.9%	32.6%	17.4%
	DJOUGOU	26	53	52	41	3
		33.8%	68.8%	67.5%	53.2%	3.9%
	OUAKE	41	49	27	38	19
		63.1%	75.4%	41.5%	58.5%	29.2%
	TCHAOUROU	27	55	44	27	3
		45.0%	91.7%	73.3%	45.0%	5.0%
Total		174	282	172	171	60
		42.9%	69.5%	42.4%	42.1%	14.8%
Female	BANIKOARA	6	16	8	5	6
		20.7%	55.2%	27.6%	17.2%	20.7%
	BOUKOMBE	22	20	10	12	4
		62.9%	57.1%	28.6%	34.3%	11.4%

Sex	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
	COBLY	5	11	3	5	0
		35.7%	78.6%	21.4%	35.7%	0.0%
	DASSA ZOUME	1	8	2	5	2
		5.6%	44.4%	11.1%	27.8%	11.1%
	DJOUGOU	3	3	5	3	1
		30.0%	30.0%	50.0%	30.0%	10.0%
	OUAKE	4	10	4	10	3
		23.5%	58.8%	23.5%	58.8%	17.6%
	TCHAOUROU	4	8	4	6	1
		28.6%	57.1%	28.6%	42.9%	7.1%
Total		45	76	36	46	17
		32.8%	55.5%	26.3%	33.6%	12.4%
Total	BANIKOARA	18	36	15	11	27
		20.2%	40.4%	16.9%	12.4%	30.3%
	BOUKOMBE	45	43	19	29	8
		60.0%	57.3%	25.3%	38.7%	10.7%
	COBLY	30	63	25	32	2
		41.7%	87.5%	34.7%	44.4%	2.8%
	DASSA ZOUME	21	38	13	20	10
		32.8%	59.4%	20.3%	31.3%	15.6%
	DJOUGOU	29	56	57	44	4

Sex	Councils	Raising tree seedlings	Planting	Spacing	Seedling management	Others
	OUAKE	33.3%	64.4%	65.5%	50.6%	4.6%
		45	59	31	48	22
		54.9%	72.0%	37.8%	58.5%	26.8%
	TCHAOUROU	31	63	48	33	4
		41.9%	85.1%	64.9%	44.6%	5.4%
Total		219	358	208	217	77
		40.3%	65.9%	38.3%	40.0%	14.2%