

Baseline Report

Impact Evaluation of the ProPFR

Benin

CENTER FOR
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ACRONYM LIST

ADC	Attestation de Détenion Coutumière
ADECOB	Association pour le Développement des Communes du Borgou
AFC	Agriculture and Finance Consultants, Bonn
ANDF	Agence Nationale du Domaine et du Foncier (national agency of estate and land)
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (German Federal Ministry for Economic Cooperation and Development)
C4ED	Center for Evaluation and Development
CAPI	Computer Assisted Personal Interview
CFD	Code Foncier et Domaniale (land code)
CoGEF	La Commission de Gestion Foncière
CPF	Certificat de Propriété Foncière
DiD	Difference-in-differences
FCFA	Franc de la Communauté Financière Africaine
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HH	Household
ICC	Intra-Cluster Correlation
INSAE	Institut National de la Statistique et de l'Analyse Economique
MCA	Millennium Challenge Account
MDES	Minimum Detectable Effect Size
PFR	Plan Foncier Rural
PSM	Propensity Score Matching
ProPFR	Promotion d'une Politique Foncière Responsable
SEWOH	Sonderinitiative Eine Welt Ohne Hunger
SVGF	Section Villageoise de Gestion Foncière (village land council)
TF	Titre Foncier
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

1. EXECUTIVE SUMMARY

ENGLISH VERSION

In this report we analyse data from the baseline survey for an impact evaluation of the Promotion d'une Politique Foncière Responsable (ProPFR), which is a GIZ funded programme to improve the land tenure security of households in the Borgou department of northern Benin. The ProPFR consists of activities to improve institutional conditions and procedures to provide guaranteed land rights, increase the participation of civil society in the process of land management, and promote the inclusion of private agricultural investors and raise their awareness for responsible land policies. The first of these stated aims includes mapping out parcels of land and recording the user rights of households in selected villages, as well as supporting the development of structures to assist in land management and conflict resolution.

Our sample consists of 2968 households, which are taken from 26 villages selected for the implementation of a Plan Foncier Rural (PFR), or rural landholding plans, which we refer to as treatment villages and 27 control villages that will not benefit from a PFR. The treatment villages were assigned by the ProPFR team in geographic clusters. The assignment of control villages follows this geographic clustering, also using further village level data with the aim of finding similar villages to maximise comparability. These clusters are spread across the communes of Bembéréké, Sinendé and Kalalé in the north and Tchaourou in the south of the department of Borgou. We collected data on a wide range of variables following the theory of change, which states that the improvements in institutions and the PFRs may lead to improved perceived land tenure security and improved access to land for women and young men through the activities carried out by the ProPFR team. This perceived land tenure security is often seen as key to agricultural investments and thereby food security in the long term, as it allows long-term planning. The issuing of official documentation provides collateral for a loan should households wish to borrow and invest in productive activities or smooth consumption.¹ The results below indicate the situation at the time of the baseline survey (May 2018) in Borgou. Combining this data with the follow-up survey, planned to be carried out two growing seasons after the completion of the PFRs, will allow us to assess the programme's effects on its beneficiaries.

Background Characteristics

The region of Borgou is dominated by subsistence agriculture. This is reflected by the fact that 74.5% of household heads in our sample state that working on their own land is their main occupation, the majority of whom consume part of their harvest. There are noticeable differences in the demographics of households between the north and the south, with considerably fewer Peulh and more Yoruba, as well as more migrants from outside of the department of Borgou in the south. On average, 14.8% of household heads originate from outside Borgou, and these households have a lower level of perceived land tenure security than those originating from the region. Female household heads, who make up a little under 10% of the sample, are more likely than male household heads to have moved within Borgou, a factor which may impact their land tenure security. Literacy rates are low in our sample with 74.9% of household heads illiterate, though this percentage is noticeably lower in Tchaourou. Households in Tchaourou also appear to be at an advantage in terms of household wealth.

¹ Feder et al's (2018) work was seminal in proposing these two channels along with the hypothesis that titling may lead to an increase in land market activity, improving the distribution of land to more productive farmers.

On average, households own 1.09 non-agricultural parcels and cultivate 1.34 agricultural parcels, with 70% of households cultivating only one parcel and 90% 2 or fewer. Households in Bembéréké exploit more agricultural plots, 1.63 plots, and in Sinendé fewer, at 1.07. In terms of total area cultivated, 70% have 5 ha or less. In total 21% of plots have the boundaries marked, though this percentage is higher in Sinendé as well as in the cluster of villages close to Parakou (35%).

Inputs

A key input to the ProPFR programme is the implementation of PFRs. Knowledge and understanding of this new legal institution related to land rights of households will be required for the PFRs to have the desired effect, along with an understanding of the law surrounding land registration and ownership. Prior to the programme beginning we should perhaps not expect many households to know of PFRs, and this is on the whole true with 23% of households having heard of a PFR (29% in Tchaourou and only 11% in Kalalé). 21% of household heads have heard of the new land code, though this figure is lower in Tchaourou at 7% as well as for female household heads at only 8%. Those who are well informed mostly obtain their information from the radio, with 74% of those who are aware of the land code having heard about it on the radio. Households originating from outside the department are less likely to know of information meetings surrounding the PFR or the new “Attestation de Détention Coutumière” (ADC), which are certificates attesting to customary rights.

A majority of those interviewed feel that registering land would lead to greater security, in particular for the landowner (roughly 90% stated registering would secure the rights of the landowner). However, there is a perception among some respondents that registering will increase the risk of losing land. This perception is positively correlated with the fear of reallocation of land. There may be demand for secured rights, with 88% of household heads claiming they would be willing to pay for documentation asserting their rights over a plot of non-agricultural land.

Activities

The market for land is currently not very active, particularly for agricultural plots of which 94.4% are either inherited, given or are first occupations of the land. Non-agricultural land is noticeably different with some parcels purchased. The extent to which land changes hand via the market remains a relatively small fraction, with 6.7% of plots purchased. Land appears to be mostly held under traditional institutions, with households possessing documents for only 0.9% of agricultural plots and 6.2% of non-agricultural plots. Plots with documents are more likely to be further from the household, though this is not true of demarcation of borders which is rare and if any relationship is in the data plots closer to the household are more likely to be demarcated. Demarcation of land appears slightly more common among female headed households and migrant households. Land does, however, change hands under some circumstances. 7% of households have given land away, 0.4% have sold land and 5% have previously lost a parcel of land, an experience which is linked to households being more likely to feel insecure about their current land.

Part of the ProPFR's activities are aimed at improving women's rights over land. Currently around 25% of women surveyed believe they have the right to own land without first obtaining permission from someone else, though this figure is substantially higher for female household heads than for women in male headed households. We observe a great deal of geographical variation, with women in Tchaourou more likely to believe they can own land without restriction. This perceived lack of security is also reflected in women's response to whether they could keep land in the case of a separation from a marriage, with 89% stating they would keep no land. It may also be difficult for women to reap the rewards of long-term planning, with only around half of women claiming that they can stay working the same plot for their whole life or for an indeterminate period. Another group

who often face weaker rights over land are the youth. The perceptions of men aged 18-35 who are not the household head nevertheless suggest they feel more secure than women. For example, they are more likely to believe they can own and manage land without restriction than women. In spite of this general perception, it typically remains beyond the remit of young men to make the final decisions on land even if they have a plot to manage. These young men rather expect to gain control of the land through inheritance, an aspiration which is far less common among women.

On a village level, land management issues are typically dealt with by the village council, though the introduction of the village land councils known as “Sections Villageoises de Gestion Foncière” (SVGF) as part of ProPFR could change this. 43% of the sample villages in fact already had an SVGF at the time of the baseline survey.

Outputs

Conflict over land is common, with 23% of agricultural plots having been the subject of conflict. The most common conflict occurs between farmers and herders, with this type of conflict more common in Tchaourou than the other communes. Tchaourou also experiences a higher total number of conflicts. Boundary contests are the second most common cause of conflict and are particularly problematic in Sinendé. While most conflicts have been resolved (65%), there is a clear difference according to gender of the household head with female headed households 15 percentage points less likely to have found a resolution to the conflict. Despite a high prevalence of conflict, most respondents do not feel at immediate risk of losing the land they currently have access to: for 87% of plots respondents reply that there is no risk, or they are unlikely to lose the plot.

One mechanism by which documentation of land rights could accelerate productivity growth is investment enabled by improved access to credit. At baseline 13.7% of households have ever asked for a loan though the majority (60.8%) did not require documentation in the application process, so currently the markets household can borrow from do not typically take land ownership formally into account. The most common uses of these loans reflect a desire to increase productivity as borrowers invest 35% of loans in agricultural inputs and 38% of loans in non-agricultural activities.

Outcomes

In the rural setting of Borgou, agriculture is the main economic activity and the crops harvested are the main livelihood of the households. Maize is the most common crop harvested (on 38.6% of fields), which is true across all communes, with sorghum and cotton playing a large role in the north while yams, cashew and manioc are important in the south. There are differences in the crop grown according to the gender of the decision maker. In the north women are more likely to plant soy while men are more likely to be involved in sorghum and cotton growing. In Tchaourou, men are more likely to grow soy and yams while women are more likely to grow cashews and manioc. Overall, there is no clear gender difference in the propensity to grow cash crops, though fields managed by the household head are more likely to include cash crops.

Typically, soil is prepared manually (more than 60% of fields) reflecting that the majority of households use traditional farming techniques. Still, for 43.9% of fields the respondent states they used fertiliser and used pesticides for 62.8%, with usage varying by crop as would be expected. Most fields are planted with seeds kept from the previous harvest and use of more modern hybrid seeds remains extremely low. Expenses on inputs are lower for plots managed by women.

In terms of investment in the plots, fallowing is generally quite rare with 10% of plots having ever been fallowed and less than 1% currently lying fallow. More plots have some infrastructure built on

the plot (22%) and investment in soil and water conservation ranges from 23%-56% between the clusters. Investments in the plots are lower if managed by a woman, as is the case for expenditures on inputs. Our analysis of correlations between variables of interest indicates that if respondents feel less secure about their rights over a plot, they are less likely to invest on it, suggesting that this part of the theory of change could play a role in the decision making of households.

Impacts

The purpose of the ProPFR is essentially poverty alleviation through the securing of land tenure rights, which means that for predominantly subsistence farming households one of the main targets is to help households to improve their agricultural production. At baseline, the value of the average harvest per hectare is around 2,105 thousand FCFA (roughly US \$3,500). There are large geographical disparities, as well as differences in the productivity by gender (men's plots are 1.66 times more productive in value terms) and by migration status (non-migrants' plots are 1.22 times more productive). As is typical in the wider literature we find a negative correlation between plot size and productivity.

At baseline 13% of households feared lacking food in the 7 days prior to the interview and 14% stated that they did not have enough to eat in the past 12 months. Here there is variation between clusters, with households from the south of Tchaourou particularly worried about lacking food. Nonetheless, respondents stated that on average adults could eat 2.8 meals per day with little geographical variation. Once again, we see that female headed households are at a disadvantage, being almost twice as likely to not have had enough to eat over the past 12 months.

Considering the responses of women about ownership of household assets, men brought most wealth into the marriage in 94% of cases, and in 73% of cases would keep the house if they separated. 53% of women interviewed claim they can make decisions about their own money and possessions and 43% claim to own a mobile phone, though these are concentrated in wealthier families meaning contacting women via this method would lead to a bias in who is reached. Women also typically do not take part in local meetings (61% claimed never or rarely to assist at local assemblies). Although slightly fewer young men claim to make decisions about money and possessions, more of them own a mobile phone (76%), and a much larger proportion own a motorcycle (44% vs 2% for women). Young men are also more likely to assist at local meetings than women, so appear to be playing a larger role in village institutions. Only 11% of young men said they would not be permitted to purchase land and register it in their own name, while this is higher for women at 40% (but decreasing in wealth).

Other Issues and Conclusions

The control villages are on average quite similar to those selected to receive a PFR. Some differences remain in a small number of variables including the fact there was more loss of land in the past and also fewer households without fear of losing land (i.e. less perceived security) in PFR villages. There was no clear difference in the level of documentation of land rights between the villages nor knowledge of the new land code and PFRs in general, key to our assumption that we can measure changes affected by the documentation of land rights. The views of households about registration, however, is something to be considered in implementation as households in PFR villages more likely to believe registering land will lead to conflict. The agricultural inputs and productivity in the two groups do not appear significantly different between the control households and those in PFR villages.

Despite a low level of document ownership attesting to land rights, respondents in general claim to feel secure about their land. The level of investment on land varies both geographically (likely associated with the prevailing conditions in the north and south of Borgou) as well as along gender lines. Not only do plots managed by women receive less investment, their productivity is also lower.

How these variables of interest develop following the implementation of the PFRs remains to be seen and data collected at endline will allow for an analysis of the effect of the programme.

VERSION FRANÇAISE

Dans ce rapport, nous analysons les données issues de l'enquête de référence pour une étude d'impact de la Promotion d'une Politique Foncière Responsable (ProPFR), un programme financé par la GIZ et destiné à améliorer la sécurité foncière des ménages dans le département du Borgou, dans le nord du Bénin. Les activités du programme ProPFR cherchent à améliorer les conditions institutionnelles et les procédures permettant de sécuriser les droits fonciers des particuliers, à augmenter la participation de la société civile dans la gestion foncière, et à renforcer l'inclusion des investisseurs agricoles privés tout en les sensibilisant à une politique foncière responsable. Le premier des objectifs escomptés inclut la cartographie des terrains fonciers et l'enregistrement des droits d'exploitation des ménages dans les villages sélectionnés par le projet, ainsi qu'une aide au développement des structures d'appui à la gestion foncière.

Notre échantillon est composé de 2968 ménages, issus de 26 villages sélectionnés pour la mise en place d'un Plan Foncier Rural (PFR) auxquels nous nous référons en tant que villages traités, ainsi que 27 villages ne bénéficiant pas de PFR et représentant nos villages de contrôle. Les villages traités ont été attribués à différentes grappes géographiques et un schéma similaire a été suivi pour la sélection des villages de contrôle. Ces grappes sont réparties entre les communes de Bembéréké, Sinendé et Kalalé dans le nord du département du Borgou, et Tchaourou dans le sud. Nous avons collecté des données sur une large gamme d'indicateurs suivant la théorie du changement du projet. Selon cette théorie, le renforcement des institutions et les PFRs permettraient de renforcer le sentiment de sécurité foncière et de garantir aux femmes et jeunes hommes un meilleur accès à la terre, par le biais des activités menées par l'équipe du ProPFR. Le sentiment de sécurité foncière permet une meilleure planification dans le long-terme et tend ainsi à être considéré comme un élément clé des investissements agricoles, contribuant à une plus grande sécurité alimentaire. Cet effet peut être renforcé par un meilleur accès aux documents fonciers pouvant servir de collatéral et faciliter l'emprunt.² Les résultats ci-dessous nous renseignent sur la situation initiale des ménages lors de l'enquête de référence (Mai 2018) dans le Borgou. L'association de ces données avec l'enquête de suivi, qui sera menée après deux saisons de croissance suivant la réalisation des PFR, nous permettra d'évaluer les effets du programme sur ces bénéficiaires.

Caractéristiques socio-démographiques

La région du Borgou est dominée par une agriculture vivrière, comme indiqué par 74.5% des chefs de ménage de notre échantillon reportant le travail de leurs terres comme occupation principale et la majorité d'entre eux consommant une partie de leurs récoltes. Il existe des différences démographiques notables entre les ménages du Nord et du Sud, avec sensiblement moins de Peuls et davantage de Yorubas dans le Sud, ainsi que davantage de migrants, définis comme d'origine extérieure au département. En moyenne, 14.8% des chefs de ménage ne sont pas originaires du Borgou, et ces ménages ont un sentiment de sécurité plus faible que ceux originaires du département. Les femmes chefs de ménage représentent un peu plus de 10% de notre échantillon et démontrent une plus grande mobilité au sein du département, ceci pouvant affecter leur sécurité foncière. Notre échantillon révèle un faible taux d'alphabétisation, avec 74.9% des chefs de ménage reportant être illettrés, ce pourcentage étant cependant plus faible à Tchaourou. Les ménages de Tchaourou apparaissent également plus aisés.

² Feder et al (2018) sont les pionniers de ce cadre conceptuel basé sur ces deux canaux de transmission, en plus de l'hypothèse que la titrisation des droits fonciers peut résulter en une plus grande activité sur le marché foncier, améliorant l'allocation des terres aux agriculteurs les plus productifs.

En moyenne, les ménages possèdent 1.09 terrains non-agricoles et cultivent 1.34 terrains agricoles, avec 70% des ménages cultivant seulement un terrain et 90% en cultivant deux ou moins. Les ménages de Bembéréké exploitent davantage de terrains agricoles, avec une moyenne de 1.63 terrains par ménage, cette moyenne étant la plus faible à Sinendé, avec 1.07 terrains par ménage. En termes de surface cultivée, 70% des ménages disposent de 5 ha ou moins. Au total, 21% des terrains sont physiquement délimités, ce pourcentage étant plus élevé à Sinendé ainsi que dans la grappe proche de Parakou (35%).

Ressources

Une des ressources clés du ProPFR est la mise en place des PFR. La réalisation des effets attendus des PFR nécessite un bon niveau de connaissance et de compréhension de ce nouveau cadre légal par les individus, en lien avec une bonne compréhension de la loi relative aux enregistrements fonciers et à la propriété. Avant le début du programme, il est légitime de penser que peu de ménages connaissent les PFR, ceci étant confirmé par notre étude avec seulement 23% des ménages ayant déjà entendu parler d'un PFR (29% à Tchaourou et seulement 11% à Kalalé). 21% des chefs de ménage ont entendu parler du nouveau code foncier, et ce pourcentage est d'autant plus faible à Tchaourou (7%) et parmi les femmes chefs de ménage (8%). Les ménages les mieux informés l'ont essentiellement été par la radio, avec 74% des ménages ayant entendu parler du nouveau code foncier par ce biais. Les ménages d'origine extérieure au département sont moins nombreux à être au courant des réunions d'information concernant le PFR ou à connaître l'Attestation de Détenion Coutumière.

Une majorité des personnes interrogées déclare que l'enregistrement des terres renforcerait la sécurité des droits fonciers, en particulier celle des propriétaires (90%). Cependant, certaines personnes interrogées craignent que l'enregistrement des terres ne contribue à une plus grande perte de terrains, ce sentiment étant également lié à la peur de réallocation des terres. Les données suggèrent une demande pour des droits fonciers plus sécurisés, avec 88% des chefs de ménages déclarant être prêts à payer pour obtenir un document pour leur terrain non-agricole.

Activités

Les activités sur le marché foncier sont très faibles. Ceci est particulièrement vrai pour les terrains agricoles, 94.4% d'entre eux ayant été hérités, donnés ou obtenus en tant que premier occupant. Les différences entre les terrains agricoles et non-agricoles sont notables, avec 6.7% des terrains non-agricoles ayant été achetés. La terre semble principalement régie par des institutions traditionnelles, avec seulement 0.9% des terrains agricoles et 6.2% des terrains non-agricoles pour lesquels les ménages possèdent un document. Les terrains documentés tendent à être plus éloignés du lieu d'habitation du ménage, alors que cela est rarement le cas des terrains dont les limites sont physiquement délimitées, ces derniers tendant à être plus proches du lieu d'habitation des ménages. La délimitation des terres apparaît comme une pratique légèrement plus courante parmi les femmes chefs de ménage et les migrants. Les terres changent néanmoins de mains sous certaines circonstances. 7% des ménages ont déjà donné des terres, 0.4% vendu des terres et 5% des ménages ont déjà perdu des terres, cette expérience étant liée à un plus grand sentiment d'insécurité foncière pour leurs terrains actuels.

Une partie des activités du ProPFR vise à sécuriser les droits fonciers des femmes. Actuellement, environ 25% des femmes interrogées pensent qu'elles ont le droit de posséder des terres sans avoir à demander la permission d'un tiers, bien que ce pourcentage soit sensiblement plus important parmi les femmes chefs de ménage. Des différences géographiques sont également notables, ce pourcentage étant plus élevé à Tchaourou. Ce manque de sécurité est aussi reflété par les réponses des femmes concernant leur capacité à conserver les terres du ménage en cas de séparation, 89% d'entre elles

indiquant qu'elles ne conserveraient aucune terre. Il pourrait également s'avérer difficile pour les femmes de récolter les fruits d'une planification à long terme, avec seulement la moitié d'entre elles déclarant pouvoir travailler sur la même parcelle toute leur vie ou pour une période indéterminée. Un autre groupe faisant souvent face à une grande insécurité foncière sont les jeunes hommes. Notre étude révèle néanmoins un plus grand sentiment de sécurité foncière parmi les jeunes hommes, définis comme les hommes de 18 à 35 ans qui ne sont pas chefs de ménage, que parmi les femmes. Malgré ce sentiment général, la plupart des jeunes hommes ne peuvent pas prendre les décisions finales sur les terres du ménage, même lorsque celles-ci sont sous leur gestion. Ces jeunes s'attendent à obtenir le contrôle des terres par l'héritage, une attente beaucoup moins répandue parmi les femmes.

Au niveau des villages, les questions de gestion foncière sont généralement traitées par le conseil villageois, une pratique que l'introduction des Sections Villageoises de Gestion Foncière (SVGF) dans le cadre du ProPFR pourrait changer. Il s'avère cependant que 43% des villages de notre échantillon disposaient déjà de cette structure au moment de l'enquête.

Produits

Les conflits fonciers sont courants, avec 23% des terrains agricoles ayant déjà fait l'objet d'un conflit. Les conflits entre agriculteurs et éleveurs sont les plus communs, et la forte présence d'éleveurs à Tchaourou contribue à un plus grand nombre de conflits fonciers dans cette commune. La contestation des limites du terrain est la deuxième cause principale de conflit et s'avère particulièrement problématique à Sinendé. Bien que la plupart des conflits aient été résolus (65%), les différences sont notables selon le genre du chef de ménage, ce pourcentage étant de 15 points de pourcentage plus bas pour les femmes chefs de ménage. Malgré une prévalence élevée des conflits fonciers, la plupart des répondants ne ressentent pas un risque immédiat de perte des terrains auxquels ils ont actuellement accès, les ménages reportant un risque nul ou très faible pour 87% de leurs terrains.

Un mécanisme par lequel la documentation des droits fonciers pourrait accélérer la croissance de la productivité est l'investissement permis par un plus grand accès au crédit. Au moment de l'enquête, 13.7% des ménages ont déjà fait une demande de crédit, bien que la majorité d'entre eux (60.8%) n'ait pas eu besoin de document foncier lors du processus d'application. Ce résultat indique qu'au moment de l'enquête, les marchés sur lesquels les ménages peuvent emprunter ne prennent généralement pas en compte la propriété foncière de façon officielle. L'usage le plus courant de ces prêts reflète le désir des emprunteurs d'augmenter leur productivité en investissant dans des intrants agricoles (35% des emprunts) ou des activités non-agricoles (38% des emprunts).

Effets

Dans le contexte rural du Borgou, l'agriculture représente l'activité économique principale des ménages et les récoltes leur principal moyen de subsistance. Le maïs est la culture la plus commune (38.6% des champs), ceci étant vrai pour l'ensemble des communes de l'échantillon. Le sorgho et le coton occupent également une place importante dans le Nord alors que les ignames, noix de cajou et le manioc sont plus importants à Tchaourou, dans le Sud. Les cultures varient selon le genre de la personne en charge de la parcelle. Dans le Nord, les femmes sont plus nombreuses à cultiver du soja alors que les hommes sont davantage impliqués dans les cultures de sorgho et de coton. À Tchaourou, les hommes ont tendance à produire du soja et des ignames alors que les femmes ont davantage tendance à cultiver des noix de cajou et du manioc. En moyenne, les hommes et les femmes dénotent une propension similaire aux cultures de rente, bien que les champs sous la gestion du chef de ménage tendent à inclure davantage de cultures de rente.

De manière générale, la terre est labourée manuellement (plus de 60% des champs) reflétant un usage majoritaire des techniques agricoles traditionnelles parmi les ménages, bien que 43.9% d'entre eux déclarent utiliser des engrais et 62.8% des pesticides, leurs utilisations variant par type de culture. La plupart des cultures sont plantées à partir de semences issues des précédentes récoltes et le recours à des semences améliorées reste une exception. Les dépenses d'intrants sont plus faibles parmi les champs gérés par les femmes.

En termes d'investissement sur les terres, la mise en jachère est généralement rare avec 10% des terrains ayant déjà été mis en jachère et moins d'1% des terrains actuellement en jachère. Davantage de terrains disposent d'infrastructures (22%) et les mesures de conservation des sols et des eaux de surface varient entre 23% et 56% entre les différentes grappes. Les terrains gérés par les femmes bénéficient de moins d'investissements, comme cela était le cas des dépenses d'intrants agricoles. Notre analyse des corrélations entre différentes variables d'intérêt indique que lorsque qu'un répondant rapporte un plus grand sentiment d'insécurité foncière, les investissements sur ses terres sont moins probables, suggérant que cette étape de la théorie du changement jouerait un rôle dans le processus de prise de décision des ménages.

Impacts

L'objectif principal du ProPFR est de réduire la pauvreté des ménages à travers la sécurisation de leurs droits fonciers. La grande majorité des ménages dépendant de l'agriculture vivrière, cela signifie que l'atteinte de cet objectif passe par une augmentation de la production agricole des ménages. Au moment de l'enquête, la valeur moyenne des récoltes par hectare est d'environ 2,105 milliers de FCFA (environ 3,500 USD). Il existe de larges disparités géographiques, ainsi que par genre (les champs gérés par les hommes sont 1.66 fois plus productifs en valeur) et statut de migration (les champs des ménages originaires du Borgou sont 1.22 fois plus productifs en valeur). En conformité avec une large littérature, nous trouvons une corrélation négative entre taille du terrain et productivité.

Au moment de l'enquête, 13% des ménages se sont inquiétés du fait de manquer de nourriture durant les 7 jours précédents l'entretien et 14% déclarent avoir manqué de nourriture durant les 12 derniers mois. Les différences entre grappes sont notables avec un pourcentage plus élevé de ménages en insécurité alimentaire dans le sud de Tchaurou. Néanmoins, le nombre moyen de repas par jour rapporté par les ménages est de 2.8 avec peu de variation entre les communes. Une fois de plus, le désavantage des femmes chefs de ménage est visible, ces dernières ayant une propension près de deux fois plus grande que les hommes chefs de ménage à avoir manqué de nourriture au cours des 12 derniers mois.

En ce qui concerne la possession de biens matériels des femmes, l'époux a apporté plus de richesses lors de l'union pour 94% des cas, et garderait la maison en cas de séparation dans 73% des cas. 53% des femmes interrogées déclarent pouvoir prendre des décisions concernant leur propre argent et biens, et 43% déclarent posséder un téléphone portable. Il est important de noter que ces dernières sont concentrées parmi les familles les plus aisées, ce qui signifie qu'informer les femmes dans le cadre des activités du projet par ce biais favoriserait ces femmes. De manière générale, les femmes ne participent pas aux assemblées locales (61% rapportent n'avoir jamais ou rarement assisté à l'une de ces assemblées). Bien que le pourcentage de jeunes hommes déclarant pouvoir décider de leur argent et de leurs biens est légèrement plus faible que celui des femmes, ils sont plus nombreux à avoir un téléphone portable (76%), et une plus grande proportion à avoir une motocyclette (44% contre 2% des femmes). Un plus grand pourcentage de jeunes hommes participe aux assemblées locales, laissant penser que ces jeunes jouent un rôle plus important que les femmes dans les

institutions du village. Seulement 11% des jeunes hommes déclarent ne pas pouvoir acheter de terres et les enregistrer à leur nom, alors que ce pourcentage atteint 40% parmi les femmes, celui-ci diminuant néanmoins avec le niveau de richesse du ménage.

Autres éléments d'analyse et conclusions

Les villages de contrôle sont en moyenne assez similaires à ceux sélectionnés pour la réception d'un PFR. Si certaines différences subsistent, cela concerne un faible nombre de variables, incluant un plus grand nombre de ménages ayant fait l'expérience de perte de terrains dans les villages traités et un plus faible nombre de ménages ne craignant pas perdre leurs terres dans ces mêmes villages. En moyenne, il n'existe pas de différence en termes de documentation des droits fonciers, ou de la connaissance du nouveau code foncier et du PFR, entre les villages traités et les villages de contrôle. Ce résultat supporte notre hypothèse selon laquelle les changements dus à une plus grande documentation des droits fonciers peuvent être mesurés dans notre cadre d'analyse. Les perceptions des ménages des effets de l'enregistrement des terres sont un élément à prendre en compte lors de la mise en œuvre du ProPFR, avec une plus grande proportion de ménages craignant que ces procédures ne mènent à davantage de conflits dans les villages du programme. Les intrants et productions agricoles ne diffèrent pas de manière significative entre les villages traités et les villages de contrôle.

Malgré la faible prévalence de documentation des droits fonciers, le niveau de sentiment de sécurité foncière rapporté par les ménages est généralement élevé. Le niveau d'investissement sur les terres varie à la fois géographiquement, sûrement en lien avec les différences existantes entre le nord et le sud du Borgou, et par genre du décisionnaire du terrain. Les terrains gérés par des femmes reçoivent non seulement moins d'investissements mais leur productivité est également plus faible.

L'enquête finale de cette étude permettra d'observer comment ces variables d'intérêt évoluent suite à la mise en place des PFR et rendra possible l'analyse des effets du programme.

2. INTRODUCTION

Together with the World Bank’s Development Research Group’s Agriculture and Rural Development team, the Center for Evaluation and Development (C4ED) is carrying out an impact evaluation of the Promotion d’une Politique Foncière Responsable (ProPFR). This programme aims at improving access to land for rural households in Benin. The ProPFR is part of the German Federal Ministry for Economic Cooperation and Development’s (BMZ) “Sonderinitiative, Eine Welt Ohne Hunger (SEWOH)”³, more specifically within the “Global project: Responsible land policy”. The project intervention is being carried out in four communes in the Department of Borgou in the Northeast of Benin: Bembéréké, Sinendé, Kalalé and Tchaourou. The ProPFR aims to provide at least 4000 households with fully documented land ownership rights (or the customary equivalent) and 5000 households with secure land use rights, of which 20% of the beneficiaries should be women, migrants or youth.

2.1 THIS REPORT

This report provides a descriptive analysis of the roughly 3000 households surveyed at baseline (prior to the programme intervention). We describe the socioeconomic profile of households in the region of intervention and compare those in the PFR villages to those in the comparison villages. The selection of these villages is clarified in section 3.

The descriptive analysis of the baseline report serves two main purposes, describing the socioeconomic profile of potential project beneficiaries and comparing households in the treatment PFR villages to those in the control villages. The latter is crucial for carrying out a robust impact evaluation; the comparability on observable characteristics between the treatment and the control households must be established. A summary of the socioeconomic characteristics of households in the treatment PFR villages will inform the implementers about the communities in which they are working. We will also provide information on perceptions of land security and conflicts as well as the current state of land rights formalisation.

Following a brief overview of the land reform process in Benin and background information for the ProPFR intervention, the rest of the report is structured as follows: in Section 3 we explain the design of the impact evaluation and the methods used to collect the data presented here, in Section 4 we discuss the survey methodology used to collect the data presented in this report, Section 5 reports baseline study results, and finally Section 6 concludes and provides recommendations.

2.2 BACKGROUND ON LAND REFORM IN BENIN

Land tenure security is crucial in ensuring poverty reduction and food security in the long run. Land is an economic asset that serves multiple important purposes: residential (building housing units), agricultural (subsistence and commercial agriculture, pastoralism), and communal (public infrastructure, national forests). Farmers who lack secure land rights are less likely to carry out essential yield-improving investments in their land as the insecurity prevents them from committing to long-term plans. Therefore, the ProPFR programme set a goal of working towards guaranteeing land rights for rural populations. The planned interventions focus particularly on setting up “Plans Fonciers Ruraux” (PFR or rural land plans) and the delivery of “Attestations de Détention Coutumière” (ADC) for those who do not hold land titles. Other objectives include securing access to

³ “Eine Welt Ohne Hunger” translates to One world without hunger.

land for populations that are typically at a disadvantage (women, young people, migrants, and other marginalised groups) which can be achieved through the strengthening of rental rights. The programme also deals with pastoralism; agreeing on livestock corridors is crucial to prevent conflicts between farmers and herders.

Historically in Benin, customary land rights have been inherited through the male lineage. This relied on local institutions to uphold a household's claim to use a parcel of land. In this setting, land was passed down from one male family member to another and any conflict was dealt with locally. With the increasing demand for access to land, as the population grows, alongside a changing set of institutions in the country as a whole, the existing institutions are often struggling to cope with the current situation.

The legal situation for land in Benin is a dynamic environment with change occurring often and sometimes abruptly. Over the past decades, Benin has been working towards the formalisation of land rights. The move towards land reform took its first steps in 1965 with a law for private property being established. However, few changes were made in earnest until the end of the 1990s when a committee was established to propose a new land regime. Following these consultations, in 2007 a new land law was voted in, which includes provisions for the recognition of customary land rights for parcels part of a "Plan Foncier Rural" (rural land plan or PFR) and the certification thereof through the introduction of the "Certificat Foncier Rural" (CFR).

The "Plan Foncier Rural" (rural land plan or PFR) is a participatory process to facilitate the recognition of customary land rights through the identification and mapping of local land tenure rights. PFRs were introduced in Benin in 1993 as part of a pilot project implemented by the Gesellschaft für Technische Zusammenarbeit (GTZ⁴) and the Agence Française de Développement (AFD) as a tool to secure the land rights of rural households (Gender Innovation Lab, 2016). In the first set of 41 pilot villages, no certificate was delivered as the legal recognition of PFRs was not confirmed until the Rural Land Act was passed in 2007. The new law provided a basis for the 2006-11 Millennium Challenge Account (MCA) to start a nationwide programme establishing roughly 300 PFRs, first creating the landholding plans and then later delivering the CFRs⁵. This occurred alongside work funded by the KfW in Attacora and Dongou in the north, where 89 PFRs were established. PFRs are a comprehensive village level intervention including information campaigns on the land law, assisting communes and villages establish land related institutions such as committees, the production of land use and tenure maps, and facilitating the issuing of land use certificates.

The 2007 law's focus was on rural areas; it was replaced by a comprehensive land code of 2013 (Loi N°2013-01), the "Code Foncier et Domaniale" (CFD). The CFD changed the legal framework for the PFR. As part of the CFD it was intended that the CFR and the land title would be replaced by a single land ownership certificate, the "Certificat de Propriété Foncière" (CPF), to be implemented by the National Agency of Estate and Land (ANDF) rather than on a decentralised level by the communes (Lavigne Delville, 2018b). During this period of uncertainty, the use of PFRs was temporarily suspended as part of a push by the Beninese government towards the construction of a comprehensive land cadastre. This was overturned in April 2017 following a successful lobbying campaign.

This new code extends the recognition of customary land rights to parcels not covered by a PFR through the introduction of the "Attestation de Détention Coutumière" (ADC). Recently (loi 2017-15

⁴ The GTZ have since been incorporated into the GIZ.

⁵ The impact of the first step of creating the land plans was studied in Goldstein et al (2018).

on 10th August 2017), the CFD was revised by devolving delivery of the ADCs to local government at the commune level (Bretel, 2018).

To conclude, customary land rights can be recognised, firstly, through the acquisition of formal land titles (“Titres Fonciers”, TFs), which guarantee absolute property rights, and are delivered by the national land agency (“Agence Nationale du Domaine et du Foncier”, ANDF), through its local divisions (“Bureaux Communaux du Domaine et du Foncier”, BCDF). The second option is through documents guaranteeing legal presumption of ownership (Attestation de Détention Coutumière ADCs), to be delivered by heads of municipalities (“maires”). They cost between 25 000 and 500 000 FCFA and can eventually lead to a formal land title. Newly established local and national institutions have a crucial role in delivering these land rights.

2.3 PROPFR IN BORGOU

In the context of the ProPFR a new wave of PFRs are being established in the department of Borgou in northern Benin, where villages from the communes of Bembéréké, Kalalé, Sinendé and Tchaourou have been selected to receive PFRs. These communes are highlighted in green in [Figure 1](#) below.

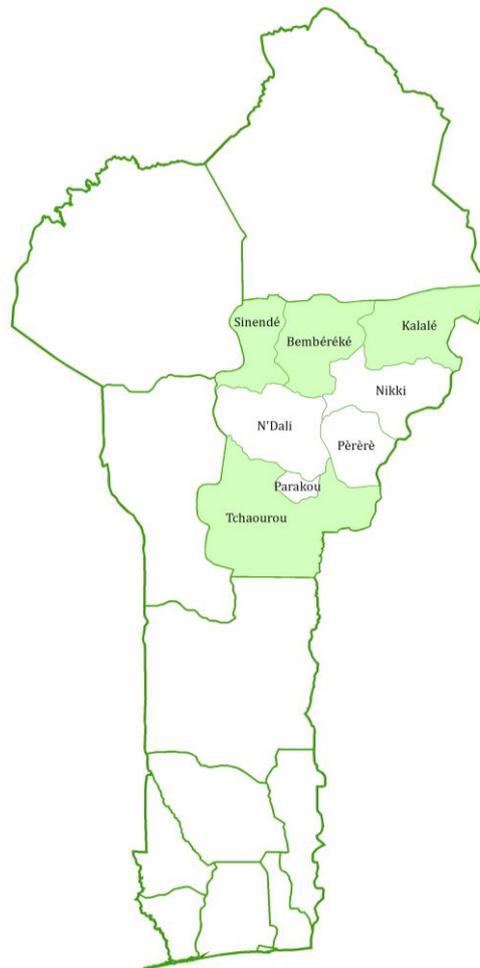
For the implementation of the current programme, the GIZ hired the consultant organisation Agriculture and Finance Consultants (AFC) to work locally from the Departmental capital, Parakou, with the local government, in the form of the “Association pour le Développement des Communes du Borgou” (ADECOP), the local mayors’ association, to implement the different facets of ProPFR. Their work together was officially inaugurated in November 2016, with the first villages originally planned to receive full implementation of the programme in June 2018, now rolling out from February 2019. There are three main facets of the ProPFR:

- i) The improvement of institutional conditions and procedures to provide guaranteed land rights (securing the rights of households, delivery of remaining CFRs from MCA project, assisting local actors in establishing an effective framework for delivery of ADCs, identifying sites to allow for formalisation of operating contracts, and the formalisation of land transactions).
- ii) The participation of civil society (make recommendations in the formulation and implementation of the legal framework for land in Benin).
- iii) Inclusion of private agricultural investors and raising their awareness for responsible land policies.

These require the spread of information among local communities as well as the implementation and founding of rural landholding plans known as Plans Fonciers Ruraux (PFR). ProPFR was planned with the introduction of the new land code in 2013 (Code Foncier et Domania). In addition to measuring plots to implement the PFR through the provision of a map for each selected village along with a table of rights holders for each plot, the ProPFR team aims to mediate conflicts arising in the course of the PFR process as well as train residents of the village to find solutions to land conflict. This will be done through the introduction of local land management committees, each known as a “section villageoise de gestion foncière” (SVGF). Finally, the ProPFR team organises sensitisation activities (radio messages, brochures) on selected articles of the new land code and on the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT). In addition to the village level institutions, AFC supported the establishment of a communal level council, the “Commission de Gestion Foncière” (CoGEF)

At the start of 2018, local officials (“Chefs Service Affaires Domaniales et Environnementales”, CSADEs) were asked to identify big landowners who do not exploit all their fields in order to encourage establishment of rental contracts for those without access to land of their own. The ProPFR project involves municipalities, and the “maires” in particular, in implementing the necessary legal framework for formalisation of land transactions.

Figure 1 - Map of Benin and the ProPFR Communes



The plan of the AFC team was to introduce the SVGFs to villages in each of the four communes they are working in and to work on the PFR maps for the clusters of selected villages. It was planned to establish 70 SVGFs in the intervention area of the project in 2018 (Bretel, 2018) and to equip them with the capacity to manage land conflict effectively and accompany PFR establishment where relevant. In early 2018, after finalising the guidelines of how the PFRs should be carried out, the ProPFR team first set about communicating with each of the communes informing them of the process to be carried out as well as distributing the remaining CFRs which had not been distributed during the MCA PFRs. The PFRs should be delivered in two waves, with the first wave including 27 villages, which were included in the baseline. Their selection is described in section 3.

[Table 1](#) presents a detailed illustration of the project activities planned for 2018 and 2019. The interventions that will be assessed through the impact evaluation (IE) include (i) the implementation of new PFRs in 27 villages, (ii) provision of land use rights for women and (iii) marginalised groups, and (iv) promoting co-ownership with women.

Table 1 - The ProPFR Project Timeline

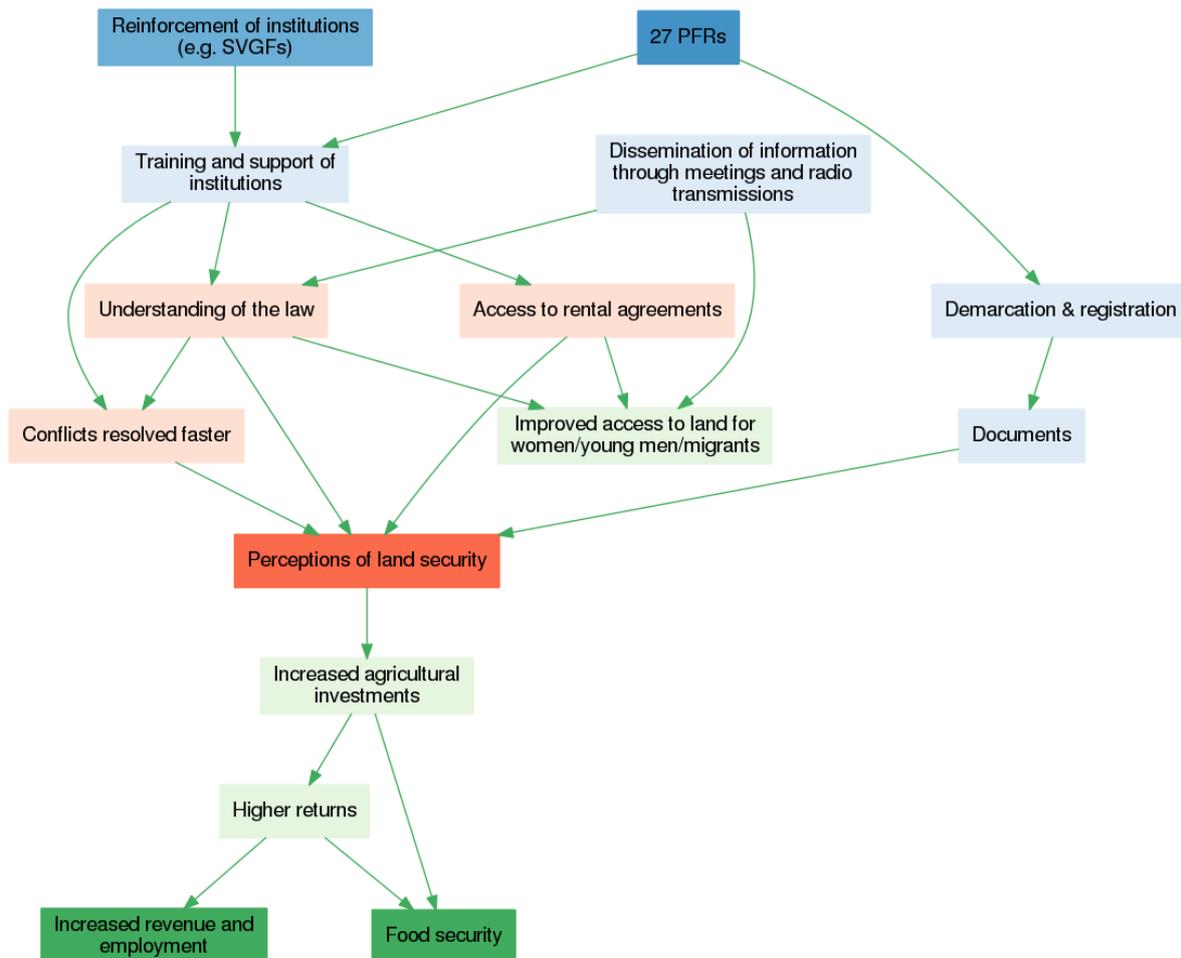
Facet	Activity	Timeline	Assessment through IE
1. Reinforcement of land rights	Realisation of a social and land survey in 82 villages	2018	
	Local agreements signed	2018	
	Operating contracts for the previous PFR areas within parcel plans / outside parcel plans	2018 / 2019	
	Provision of land use rights for women	2019	Yes
	Formalisation of land use rights for pastoralism	2018	
	Provision of land use rights for marginalised groups	2019	Yes
	Update of existing PFRs in 4 communes	2018	
	Implementation of new PFRs in 27 villages	2018 and 2019	Yes
	Delivery of the remaining CFRs	2018	
	Promoting co-ownership with women in households	2019	Yes
2. The participation of civil society	Provision of a database to record conflicts in each commune	2018	
	Conflict monitoring tools	2019	
	Establishment and reinforcement of civil society platforms for conflict resolution (70 SVGFs)	2018	
	Development of conflict prevention tools (VGGT etc.)	2018	
	Provision of conflict management tools	2018	
3. Inclusion of private agricultural investors	Realisation of a study on agricultural investors	2018	
	Organising an annual meeting of multiple actors	2018	
	Preparation of a charter to be signed by agricultural investors and ministers		

3. IMPACT EVALUATION DESIGN

This section will present the evaluation design chosen to estimate the effectiveness of the PFR programme in addressing the main problems identified in the region of interest.

Evaluation questions are derived from the theory of change, as shown in [Figure 2](#), which helps to clearly define the main expected outputs (red), outcomes (light green) and impacts (dark green) of the programme derived from the inputs (dark blue) and activities (light blue) and the channels at play. Through the implementation of the PFR programme parcels will be demarcated and registered, allowing households to more easily pursue a TF to the land they own or an ADC. Dissemination of information about the new land code aims to make households understand the law better. Changes in perception of land tenure security and faster conflict resolution will hopefully occur as a result of these developments, which should then in turn lead to higher long-term agricultural investments ultimately increasing outputs, food security and the income of farmers. The use of radio transmissions may also raise awareness of land security issues to those who typically lack access to such information, including women, young men and migrants. This aims to improve the land tenure security of women and young adults who traditionally have experienced more uncertainty surrounding the land they are able to use and especially land ownership rights.

Figure 2 - Theory of Change



This theory of change leads to the following research questions to be answered after the endline data collection:

1. Do PFRs contribute to a perception of greater land tenure security?
2. Does improved tenure security lead to a growth in agricultural investment and/or changes to management of land?
3. Do PFRs improve access to land and rights over land among marginalised groups (women, youth and migrants)?
4. Do PFRs lead to an increased number of land transactions?
5. Does increased land security address existing constraints on land markets and lead to more efficient allocation of land resources and thereby an increase in productivity?
6. Do property rights and improved user rights result in better access to credit, possibly allowing for income diversification and thus increasing household welfare?
7. Do the new arrangements put in place during the implementation of the PFRs facilitate the resolution of land conflicts, or even prevent the emergence of these land conflicts?

Improvements in the perception of land security are likely key to changes investment behaviour and therefore also in productivity and food security, and these perceptions will likely be the first observable change in the outputs of the programme. This means that question number 1 is where we expect to find the largest impact. Changes to investment behaviour will likely take more time to occur. The endline data collection is therefore planned to take place after two growing seasons following the completion of the implementation of the 27 PFRs. By allowing two growing seasons, it is hoped that households will have time to change their investment behaviour, as reflected in question 2, which in turn could affect agricultural productivity, as reflected in question 5.

To evaluate these questions, two rounds of data will be collected. The first round of data collection is described in detail in this report. The second round of data collection will be carried out after the project has been implemented and households have had time to react to the changes in the institutional environment around them. This will allow us to compare households in the treated PFR villages with those in control villages, whose selection is explained in the following chapters.

For an impact evaluation to attribute statistical differences in the outcomes of interest to a programme, the units being treated (households in ProPFR villages in our case) must be compared to units which did not receive the treatment, but which are as similar as possible prior to the treatment being implemented. If the comparison group (the control) are different even before a programme is implemented, then it is not clear if the programme caused any differences after the programme or whether the differences are rooted in the underlying characteristics of the two groups. For this reason, a control group must be established which is similar prior to the programme, i.e. at the time of the baseline survey. These control villages were selected to maximise the probability that these villages were indeed similar, as described in chapter 4. Under some conditions it is remains possible to attribute causal impact to a programme even when the treatment and control villages are not well balanced for some variables prior to the intervention being evaluated.

For variables in which the treatment and control groups display balance at baseline we will be able to compare the averages across the two groups at endline. If this is not the case and the treatment and control villages have different levels, then we can use a difference-in-differences (DiD) specification if we are confident that they would have developed in a similar manner, i.e. the trends of such a variable are parallel for the two groups. This would allow us to attribute the change/difference over time in the differences between the treatment and control groups to the implementation of the PFRs in the 27 selected villages.

Some concerns may remain that the trends in the outcomes of interest would not be parallel in the absence of the programme for the treatment and the control. To enhance the likelihood that the sample chosen for the analysis include households which are similar to one another in the treatment and control group, we can make use of matching techniques, such as propensity score matching, to find households which are more convincingly similar to those in the villages selected for treatment.

4. SURVEY METHODOLOGY

4.1 SELECTION OF SAMPLE AREAS

The Borgou department was selected by the GIZ for the implementation of the ProPFR with a focus on the four communes mentioned in the introduction: Bembéréké, Kalalé, Sinendé and Tchaourou. Following meetings with the implementing AFC team, it was made clear that the treatment would be implemented on a village level. These villages were selected in 11 geographical clusters of villages facing similar issues, allowing easier logistical planning for the rollout of the PFRs.

Villages selected to be part of the programme should have the following characteristics (see Note 03 of Bretel, 2018; p60):

- Bordering/near to a classified national forest
- At high risk of land grabbing,
- The presence of another SEWOH project⁶
- Agropastoral areas (in particular the presence of transhumance –cattle driving - corridors)

But should not have the following:

- Villages bordering Nigeria, within the band of increased security
- MCA intervention with a PFR
- Suffered serious conflict which could block the realisation of a PFR, or where a PFR may reignite past conflicts

These characteristics alongside the desire of the implementing team to select villages in clusters, for practical reasons presented the first challenge in selecting suitable comparison villages to measure the impact of the ProPFR programme. Clustering meant that villages selected for comparison should be near the clusters to be comparable, but given the typical geography of villages in northern Benin, in that most people live in the village centre rather than spread evenly with sufficient density at the village boundary, and the lack of clearly defined village boundaries, a geographic discontinuity could

⁶ The most common programme is ProSOL, a programme to protect and rehabilitate the soil, but also include ProFINA and ProAgri.

not be exploited. The control villages should ideally also have the same characteristics, though only the first bullet point could be clearly measured with the available data.

The second challenge in selecting comparison villages arose at this point due to a change in the village definitions in 2013, when Benin changed from 3758 to 5290 villages which is often referred to as the “nouveau découpage”. Some old villages were split but there are no clearly defined village boundaries for the new set of villages. ProPFR selected from among the new villages, so the control villages also needed to be selected from this list. Given that the last census was collected prior to this new definition of villages, no data about the villages exists that can easily be used in matching villages to those selected for the ProPFR.

Due to this lack of data on the characteristics of the people residing in the villages, Geographical Information Systems (GIS) data were used to match each of the treatment PFR villages to a control village. Villages which were previously included in the MCA’s wave of PFRs were excluded from our study due to the difficulty in separating the effects of the two programmes (MCA vs ProPFR).

As indicated earlier, control villages should be as similar as possible to those selected to receive the ProPFR treatment. In order to maximise cultural similarity between the treatment and control villages, control villages were selected to be geographically near to the PFR villages. For each PFR village, a buffer of 20km was drawn and the union constructed for each cluster. Within this area, other villages were considered as a potential control village. Of the selection criteria, the only one applicable from GIS data is the proximity to a national forest. Where villages were close to a national forest, we attempted to match it with a control village also close to a national forest.

The additional criteria on which villages were matched were the proximity to a main road (as classified by the Open Street Map shapefiles for roads) and the number of buildings in the central agglomeration of a village (using supplementary data from a shapefile of buildings extracted from satellite imagery by Digital Globe). Main roads are used as a proxy for access to markets and thereby potentially income levels. The size of a village and the amount of land which can be used around it will be influenced by the size of the population as well as the presence of national forests. The underlying hypothesis upon which the selection of villages is based is that these characteristics lead to villages facing different challenges in their land use, such as the use of common lands and pressure on land available. This matching strategy led to the villages shown in [Table 2](#) where in some cases villages were chosen from across the border in another commune as these appeared a better match than any villages within the commune.

For cluster number 10, there were no other villages within the 20km buffer and so villages from further away were used. On the other side of the same national forest were a number of villages from which we selected the three comparison villages.

Table 2 - List of Villages

	Bembéréké	Kalalé	Sinendé	Tchaourou
Number of ProPFR vilalges	9	6	6	6
<u>ProPFR Villages</u> <i>ID#.</i> <i>Village name</i> <i>(Cluster number)</i>	3. Kokabo (1) 2. Kinninkou (1) 5. Saoré (1) 17. Timbouré (2) 13. Dantcha (2) 8. Bouratèbè (2) 9. Sombouan 2 (2) 11. Guera n’kali (3) 10. Boro (3)	24. Matchorè (7) 23. Maréguinta (7) 19. Boca Gando (8) 21. Kourel (8) 28. Ouénagourou (9) 25. Djèga (9)	38. Didi (4) 37. Guessou Bani (4) 37. Diadia (5) 42. Kossia (5) 34. Goro Bani (5) 31. Toumé (6)	54. Agbassa (10) 43. Oloungbe (10) 46. Koda (10) 48. Kika (11) 50. Kokobe (11) 53. Sui-Gourou (11)
<u>Control Villages</u> <i>ID#.</i> <i>Village name</i> <i>(Cluster number)</i>	6. Wanrarou (1) 1. Bérou (1) 4. Pédarou (1) 32. Kparo (2) [Note: In Sinendé] 7. Beroubouay Peulh (2) 15. Kpebera (2) 16. Mani Boke (2) 14. Ganro (3) 12. Sissigourou (3)	22. Derassi (7) 27. Kirikoubé (7) 29. Gando-Baka (8) 26. Dunkassa (8) 20. Gbérougbassi (9) 30. Péonga (9)	35. Wari Gando (4) 40. Gourou-Kpérou (4) 39. Gouré-Guessou (5) 33. Dombouri (5) 36. Bouro (5) 18. Konou (6) [Note: In Bembéréké]	45. Alafiarou (10) 44. Agramarou (10) 47. Koko (10) 51. Kpari (11) 52. Kpassa (11) 49. Kika II/Kika Barrage (11)

Our strategy is similar to a Coarsened Exact Matching (CEM) strategy (see Blackwell et al, 2009), in which key characteristics are reduced (perhaps from continuous variables) to a small number of categories and matched with one another exactly. In our selection of villages, one control village was selected for each treatment village based on the key characteristics, defined as proximity to national forests (5km) and main roads (1km), and having a similar number of buildings (within 1km of the central point).

For a small number of villages, we faced an issue of common support, meaning there were no exact matches on the key characteristics. In this case other nearby villages were selected which fulfilled as many of these characteristics as possible. In spite of this issue of common support, there is no clear imbalance on average between the villages as can be seen in [Table 3](#), where the variables show no significant differences for the selection characteristics.

Table 3 – Control vs Treatment Villages

Variable	N	(1)	N	(2)	t-test
		Control		Treatment	(1)-(2)
		Mean/SE		Mean/SE	Difference
Buildings in village	27	398.593 [42.881]	26	434.885 [40.912]	-36.292
Distance to forest	27	4865.986 [940.594]	26	6594.297 [1308.746]	-1728.311
Forest within 5km	27	0.481 [0.098]	26	0.462 [0.100]	0.020
On main road	27	0.667 [0.092]	26	0.500 [0.100]	0.167

The value displayed for t-tests are the differences in the means across the groups.
 ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Note: Agbassa/Oloungbé are treated as one village with the number of buildings in the total area divided by two

In early 2019, we were also presented with a village database prepared by the ProPFR team including variables covering the selection criteria more directly. While this could not be used in the selection of villages it is of interest to see whether our selection strategy worked well.

Table 4 - Control vs Treatment Villages ex post (ProPFR data)

Variable	N	(1)	N	(2)	t-test
		Control		Treatment	(1)-(2)
		Mean/SE		Mean/SE	Difference
SVGf installed in village?	27	0.407 [0.096]	26	0.385 [0.097]	0.023
Households under old village boundaries	23	400.522 [59.990]	19	441.789 [63.316]	-41.268
Village has participatory mapping	27	0.963 [0.037]	26	1.000 [0.000]	-0.037
Priority village for ProSOL	27	0.148 [0.070]	26	0.154 [0.072]	-0.006
Risk of land grabbing	27	0.185 [0.076]	26	0.115 [0.064]	0.070
Major conflicts	27	0.111 [0.062]	26	0.115 [0.064]	-0.004
Agro-silvo-pastoral	27	0.593 [0.096]	26	0.808 [0.079]	-0.215*
Forest nearby	27	0.296 [0.090]	26	0.385 [0.097]	-0.088
Major role of cotton growing	27	0.407 [0.096]	26	0.423 [0.099]	-0.016
Frontier village with Nigeria	27	0.000 [0.000]	26	0.000 [0.000]	N/A
Village has transhumance corridor	27	0.111 [0.062]	26	0.038 [0.038]	0.073
Village has pasture area	27	0.074 [0.051]	26	0.038 [0.038]	0.036
Rural village	9	1.000 [0.000]	8	1.000 [0.000]	N/A

The value displayed for t-tests are the differences in the means across the groups.
 ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

A comparison of the two groups show that the only significant difference between the treatment and control villages shown in [Table 4](#) find that only the issue of whether a village is coded as being agro-silvo-pastoral by the ProPFR team following advice from the mayor's office, where 22% more of the villages are defined as agro-silvo-pastoral among the treated villages.

The following pages include maps of the four communes with the treatment and control villages indicated by green and red points respectively. It should be noted that the clusters are not indicated here and that Konou in Bembéréké is not shown on the same map as Toumé in Sinendé (the other village in the same cluster).

Figure 3- Map of Bembéréké

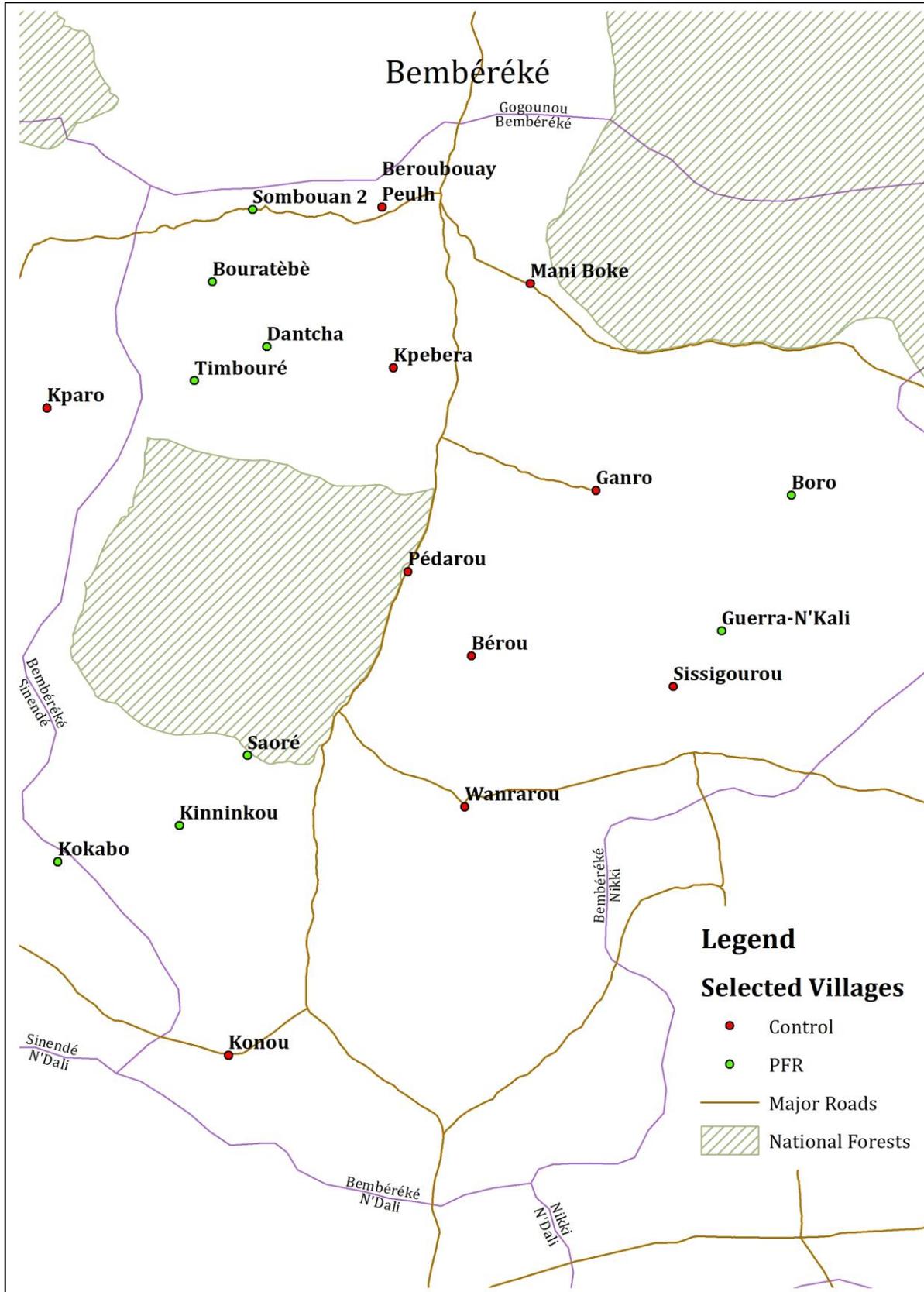


Figure 4 - Map of Kalalé

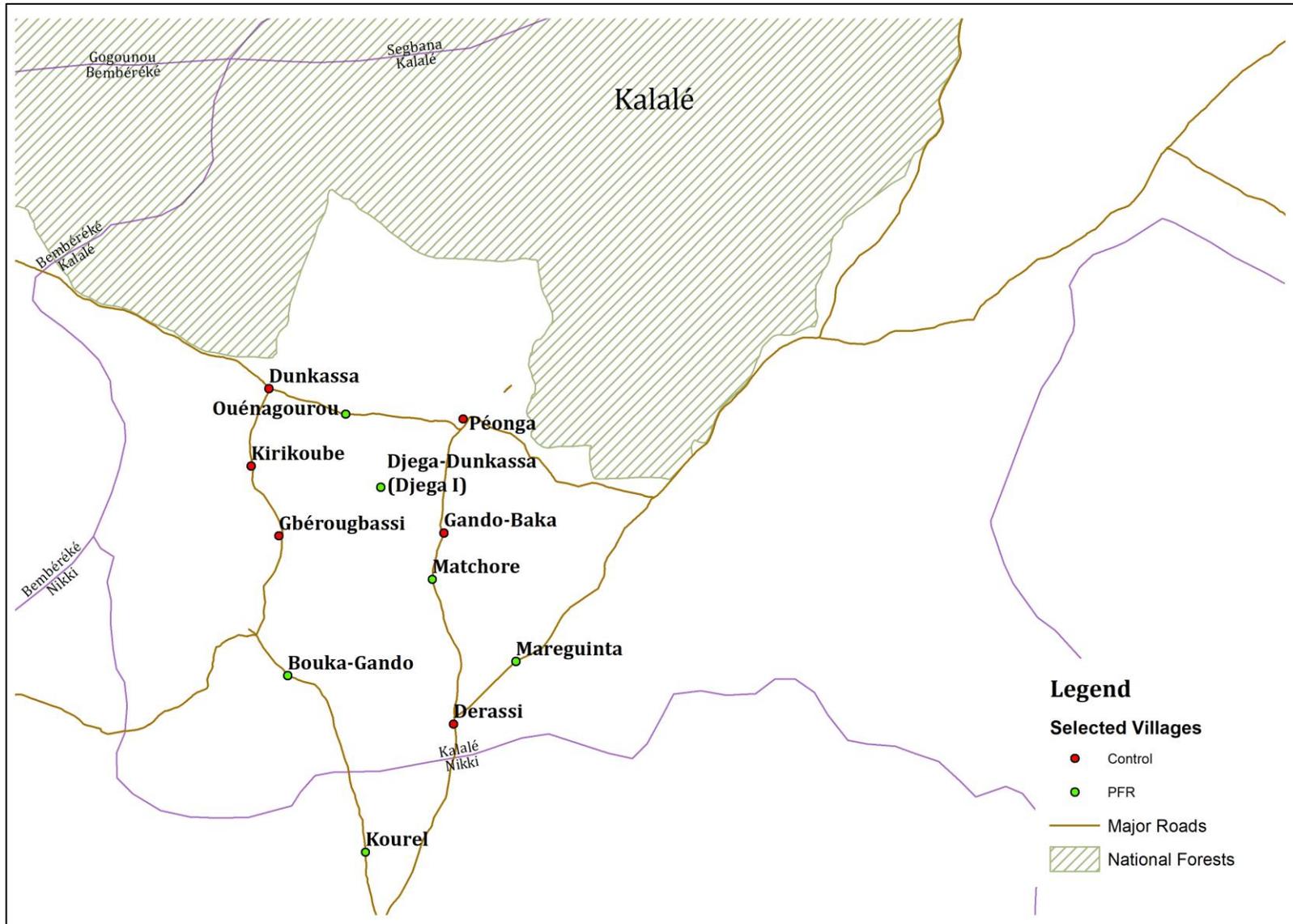


Figure 5 - Map of Sinendé

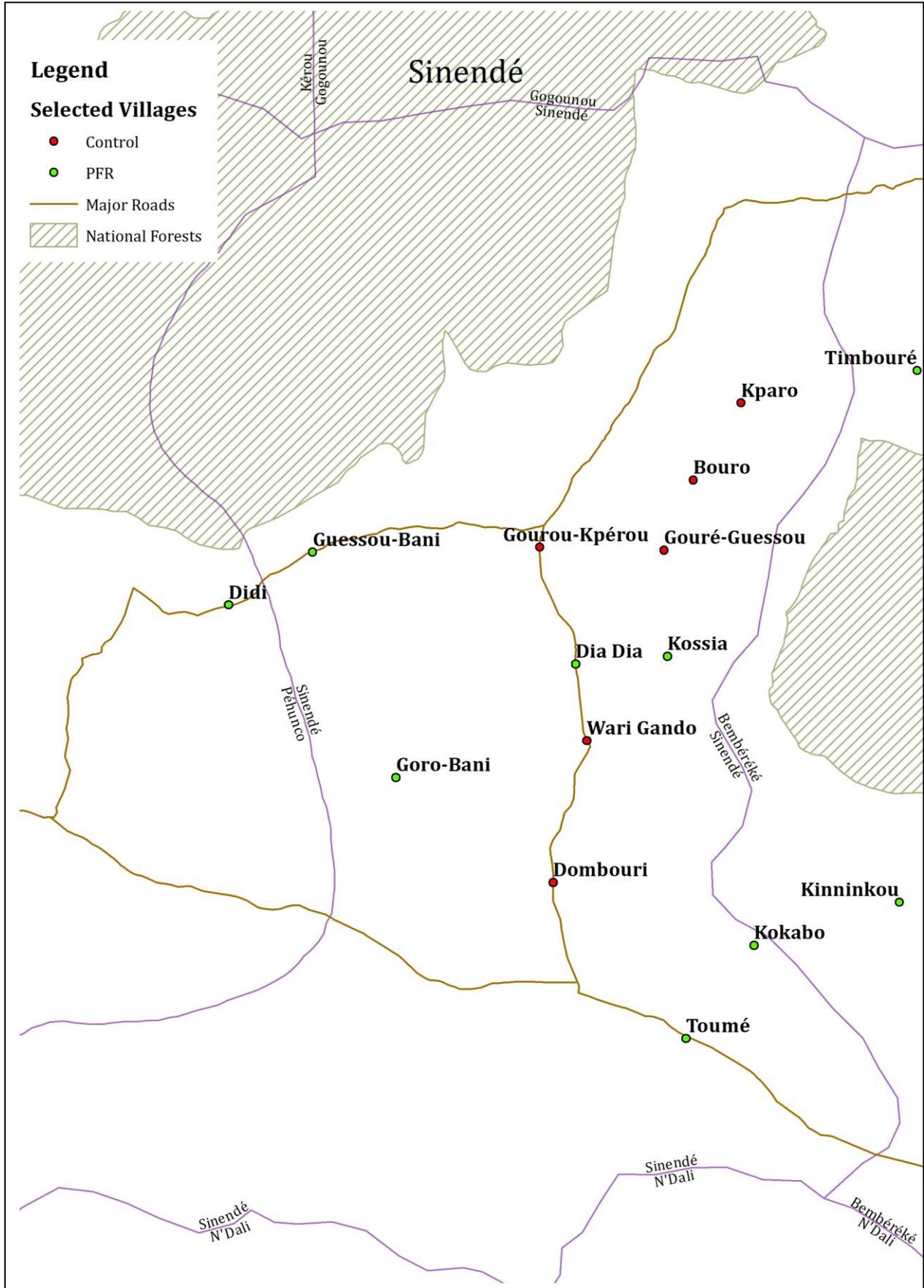
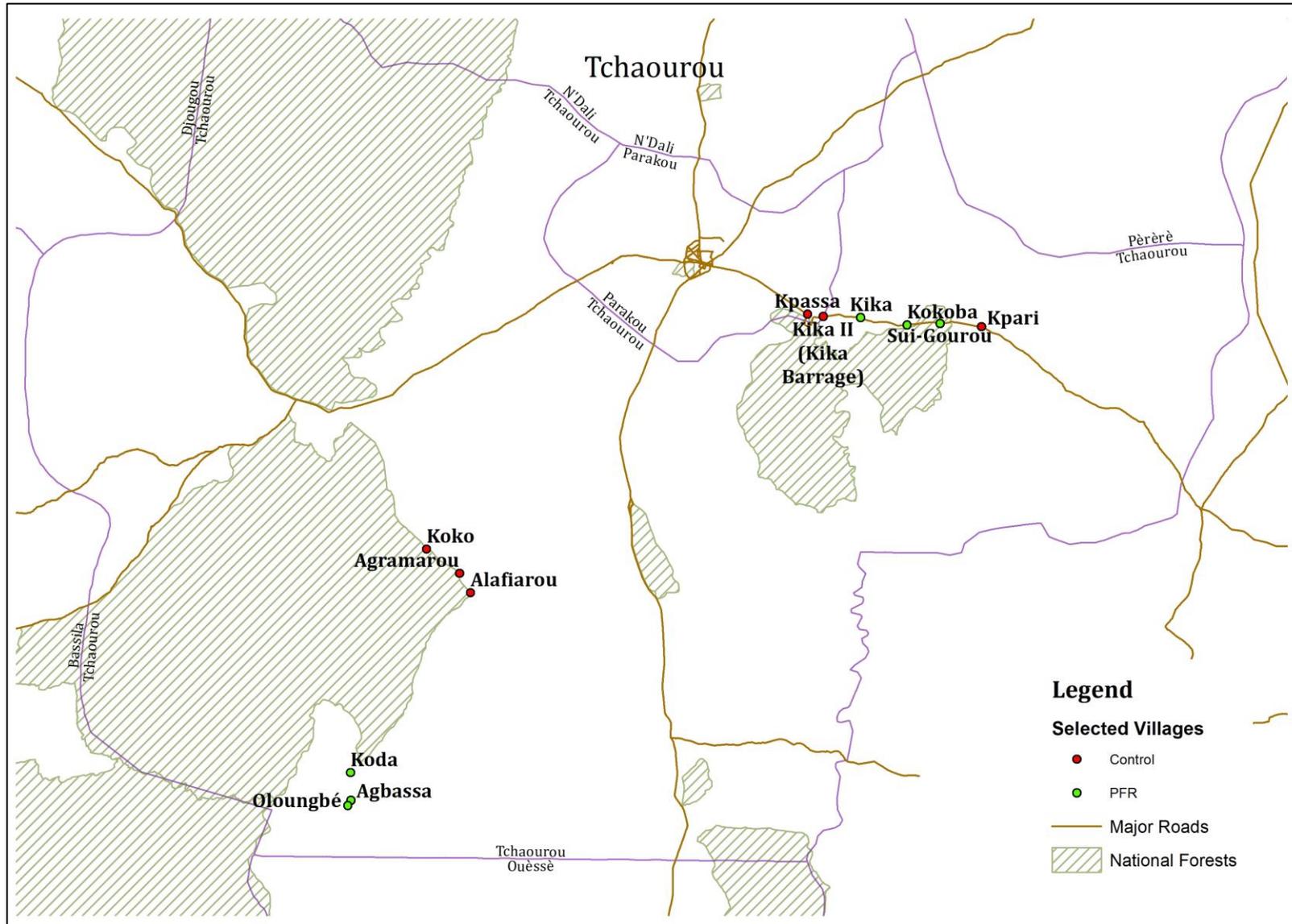


Figure 6 - Map of Tchaourou



4.2 BASELINE SAMPLING

From each of the 54 villages selected for the impact evaluation, 56 households should be sampled to reach approximately 3000 households. Typically, the selection of households from within a village to take part in a survey would either make use of an existing list of village members or carry out a village census to construct the sample frame.

A reliable and recent list of households from each village was not available requiring the research team to create a sample frame first, typically done by carrying out a listing exercise. However, due to time pressure to begin surveying prior to the programme starting and budgetary concerns about the additional work to run such a listing exercise, an alternative strategy was developed to construct a sample frame from which to select households. High precision satellite imagery was analysed by Digital Globe to create a shapefile for all the buildings in the required areas of Borgou. These buildings served as a proxy for households in each village.

While it is clear which village the buildings close to the village centre belong to, it is more difficult to tell for those in more remote areas. Some subset of the buildings in the commune must be defined as the sample frame for each village, but unfortunately GIS data for the village boundaries does not exist. According to INSAE, maps defining the extent of each village do not exist for the new decoupage in any form as the boundaries were not officially defined. INSAE did provide (non-georeferenced) map images of the old villages in Borgou which were used as a guide in defining enumeration areas from which to draw household buildings. Within these enumeration areas, buildings large enough to serve a residential purpose⁷ formed the sample frame from which buildings were randomly drawn. As explained below, this will likely lead to households owning more buildings to be more likely to be included in the survey.

The coordinates of these buildings were provided to the enumerators within the CAPI survey to locate the household using the pre-loaded maps available on their tablets. This proved a significant challenge for the enumerators hired, as the understanding of maps seemed in general to be low in this group. This in turn necessitated additional training to ensure that the enumerators (with the assistance of the team leaders) would be able to reliably find the selected building for surveying.

⁷ At least 5m².

Figure 7 - Enumeration Areas Example

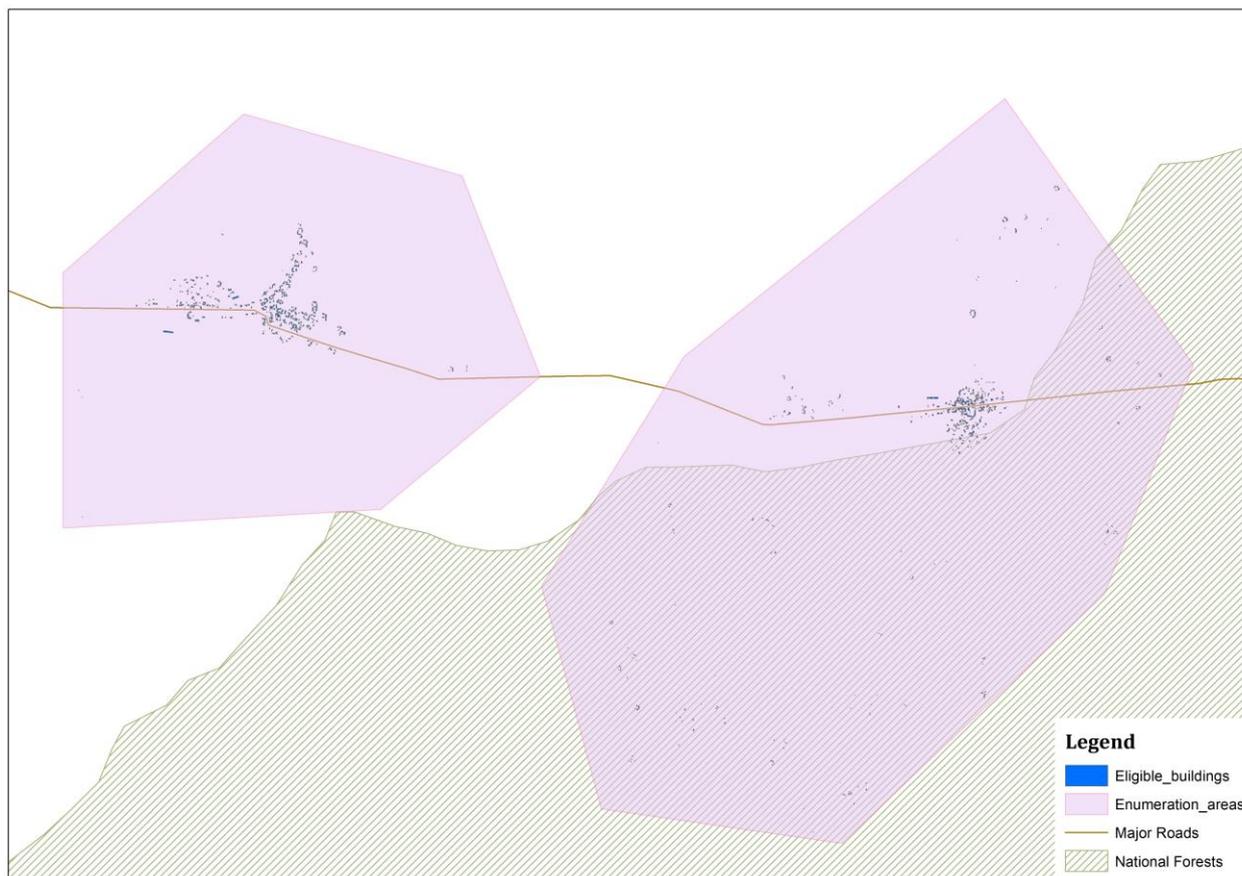


Figure 7 shows an example of two enumeration areas with the buildings in each area from which the sample was drawn. The majority of buildings is typically at the village centre with some buildings further from the centre. Replacement buildings were required in cases where the building did not belong to a household (e.g. a school) or when multiple households belonging to the same household were drawn. Where multiple households lived in a building, one household was randomly selected from these households. Households may alternatively own multiple buildings, potentially causing issues of sample selection, where households with multiple buildings, who tend to be richer, are more likely to be surveyed. Our strategy essentially leads to sampling with probability proportional to size, where the number of buildings belonging to a family is the size⁸. To adjust for any potential bias in the evaluation results, we plan to collect data on the number of buildings belonging to a household at endline. This variable can then be used as a survey weight to counteract any bias arising from this issue.

4.3 QUESTIONNAIRE DESIGN

Two CAPI surveys were developed, one on a household level and the other on the village level. The extensive household survey was first asked to the household head with additional modules to be answered by the wife of the household head (or the female household head) as well as a young male (defined as an unmarried man, aged 18-35).

⁸ Where a building is shared by several households, we will consider each household to own an equal share of the building.

The full household survey can be found in [Appendix 2: Household Survey](#) and is structured in 14 modules with 7 rosters. Modules include household members, employment and enterprises, durable goods, housing, census of non-agricultural plots, agricultural plots, land donations, land sales, land losses, perceptions on land tenure, participation in PFR, loans, food security, young men and women⁹. Several rosters were generated to record specific information on household members, non-agricultural plots, agricultural plots, fields within these plots, parcels that were subject to a transaction (including land given, sales) and to losses, and adult household members that ever applied for a loan.

The community questionnaire can be found in [Appendix 3: Village Survey](#). The community survey was administered to each village in the form of small group interviews to collect information on the socio-economic characteristics of these villages, local land tenure structures and practices, and local prices on agricultural inputs and production. The questionnaire is organised in 9 modules: characteristics of the survey participants, land tenure, land use, land market, land conflicts, other village structures and interventions, agriculture, PFR, and village chief. The characteristics of the participants were recorded in a separate roster.

4.4 TRAINING AND DATA COLLECTION

A 10-day training for the baseline survey was held in Parakou in May 2018 by INSAE, with the support of C4ED. The training included reading through the field guide and both of the questionnaires, and training on map literacy. Training on map literacy, while not originally planned, proved necessary as most enumerators had troubles using the GPS to locate the selected households and were not able to understand the maps shown on the tablets well enough to enter the limits of plots within Survey Solutions. By the end of the training C4ED were satisfied that the enumerators had a good understanding of the questionnaire to complete the survey with the sampled households.

The training also included a pilot survey conducted in the outskirts of Parakou. The pilot survey revealed severe deficiencies regarding the enumerators' ability to draw limits of the fields. As a result, three additional days were dedicated to extra practice of locating households using the GPS and mapping fields. Additionally, supplementary materials were produced to help the enumerators with using the GPS functionality on their devices and how to plot the limits of the fields. After the training, 48 interviewers and 12 team leaders were selected out of 69 agents, according to their skills and level of understanding of the survey.

Baseline data were collected between May and June 2018. The questionnaires were administered in face-to-face interviews in the respondents' homes using tablets with Survey Solutions installed. During the first week of survey implementation, C4ED was present in the field to ensure that rollout ran smoothly. Throughout the data collection, staff from C4ED checked the progress via the Survey Solutions online platform. Checks of a subsample of entire surveys were made during the first two weeks to review the answers being entered by the enumerators, giving additional feedback to the INSAE team where issues were identified.

Throughout the data collection process, two main issues have been reported by INSAE's staff. The first pertains to the sampling methodology of buildings, that led to the necessary replacement of pre-selected non-housing buildings. The second issue concerns the refusal of the village Sombouan 2 to participate in the survey. Despite several attempts, this village had to be excluded from the survey.

⁹ The final two modules are asked of individuals within the household rather than to the household head.

4.5 DATA QUALITY ASSURANCE AND NON-COMPLETION RATES

Various consistency checks have been performed by INSAE to ensure data quality, including systematic reports of contradictory answers and of extreme values.

The selection of buildings to interview by satellite imagery led to the misclassification of several objects as housing buildings. In the household data, enumerators marked 179 out of 3438 buildings assigned to them as an empty building or not a residential building. A further 80 indicated the building was derelict, with 62 unable to find the building. In 23 cases, nobody could be found at the building and so the survey could not be carried out. There were 112 further cases marked as “Other” which include issues such as households already being surveyed from another building, leaving 2982 of 3438 buildings where the household survey was carried out. After dropping those surveys completed on the first day of surveying in Sombouan 2 and ensuring consent was given there are 2968 completed baseline surveys. From these numbers, it can be seen that just short of 500 households required replacement. The majority of the buildings replaced were not residential buildings and were therefore not eligible for inclusion in the survey. These were replaced by the next building in the random order of buildings. The number of buildings for which nobody could be found for surveying was very low (23) suggesting that there is not a big problem of selection bias through the replacement protocol.

The quality of the parcel boundaries data differs by input methodology. The areas of non-agricultural and agricultural plots owned by households were mapped, recording the GPS coordinates for the plots to clearly identify the plot being discussed and to allow for further analysis with GIS data. The data was intended to be collected with remote imaging used within the CAPI software but had to be performed at the field when the respondent could not indicate their plot on the map provided on the tablet. Where further issues were encountered and the location of the field could not be found on a map even when the enumerator was located at the field (due to problems with the GPS module of the tablet used), a third alternative was implemented to create shapefiles for the agricultural plots. In this case, enumerators had to walk around the plot with an alternative GPS device and to enter the coordinates manually into the CAPI app.

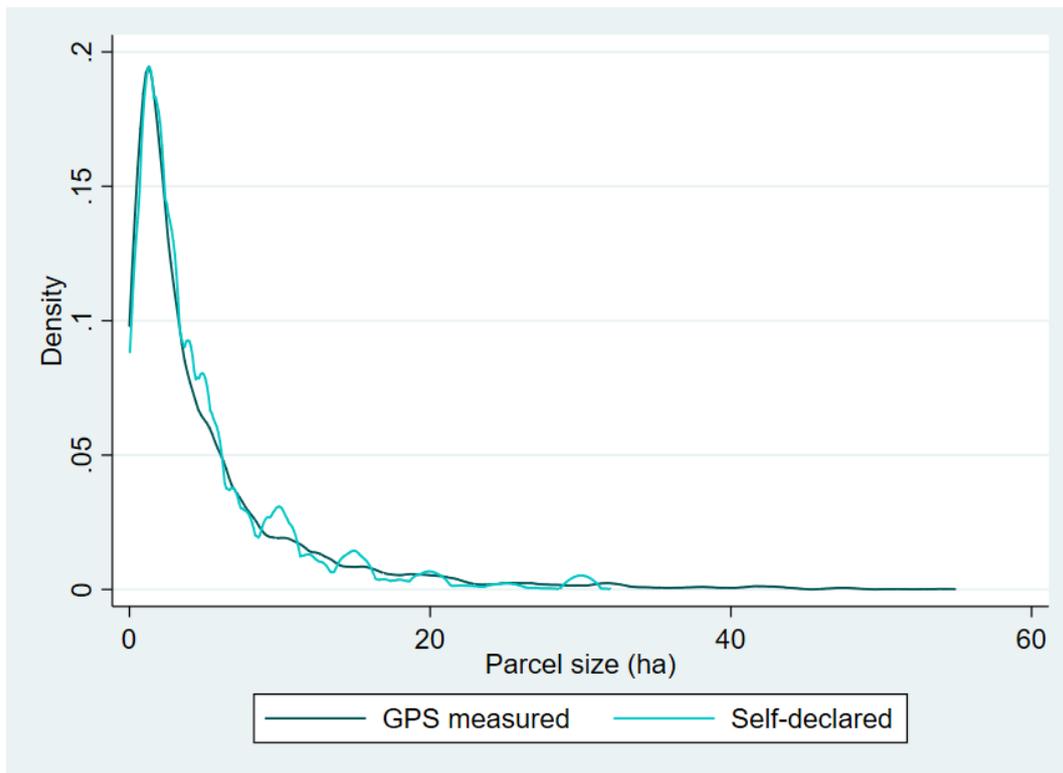
The distribution of these input methodologies is presented in [Table 5](#). The mapping of the recorded areas revealed some clear discrepancies when the coordinates were manually entered, with unrealistically large parcels. Overall, there are important differences between the reported size of the plot and computed areas based on the GPS coordinates, these differences being smaller when remote imaging was used in absence from the field. For agricultural plots, once we remove plots in the top percentile of computed areas, going around the plot is the method with the second smallest average discrepancy between measured and reported areas. This is not to say that reported areas are correct, but nonetheless gives an impression of potential data quality, which will be complemented further through spot checks to compare the quality of plots alongside high resolution imagery.

Table 5 - Parcel GPS entry methods

Input Methodology	Agricultural		Non-Agricultural	
	Freq.	Percent	Freq.	Percent
1. Remote imaging absent	358	9.21	494	22.27
2. Remote imaging at field	2,186	56.24	1,034	46.62
3. Traverse and GPS	1,343	34.55	690	31.11
Total	3,887	100	2,218	100

The distribution of the plot sizes (trimming the top 1% largest plots) can be seen below in comparing the self-declared sizes alongside the measured sizes, first combined (Figure 8) and then separated into the different GPS measurement techniques (Figure 9). Seeing as we only collect GPS coordinates with one technique rather than all techniques for all plots, a direct comparison of the different GPS collection techniques is not feasible. We do not observe a difference in the distribution of the plot sizes in Figure 8, which is suggestive that the collection of GPS data is of an acceptable quality on average. It could still be the case that large and small plots are completely mis-measured, and so switch places in the distribution, and that only the final distributions are similar, but this seems unlikely. This also suggests that households’ own estimation of parcel size is fairly accurate¹⁰ on average. The plot sizes are discussed in more detail in section 5.1.

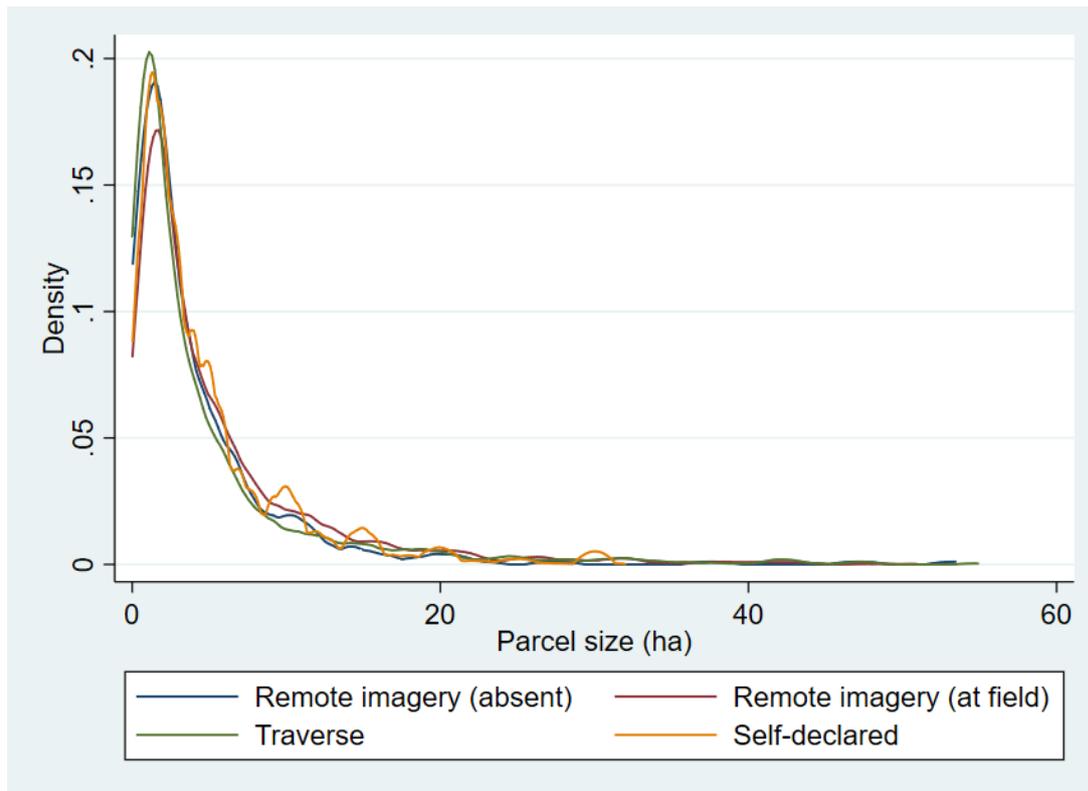
Figure 8 - Comparison of the agricultural plot size distribution for self-declared and measured area



Below, it can be seen that the distributions for the individual methods for area calculation are also similar to one another. Slightly more of the parcels measured by traversing are smaller in size than for the other techniques, while remote imagery at the field tends to lead to larger sizes, with the mass of the distribution to the right of the other techniques. This may only be related to the respondents preferred response technique according to parcel size rather than saying anything about the accuracy of measurement for the different techniques.

¹⁰ The distributions are similar to those found for Vietnam and the Philippines in Dillon and Rao (2018) in a study of plot size estimation.

Figure 9 - Comparison of the agricultural plot size distribution for the four separate collection techniques



We computed item non-response rates for each questions of the household survey. Overall, almost all the survey has been successfully completed by the respondents. Only a few variables are concerned by higher non-response rates. These include values harder to recall and to estimate: the estimated value of the harvest, the estimated value of the part of the harvest that was sold or traded, the surface area that was owned when the household was founded, and units of area of land that was sold or lost. However, these missing values do not challenge the quality of the survey. Information on estimated harvest value can be recovered using reported price levels from the community survey and missing information on the surface area of land transaction only concerns 39 households.

5. BASELINE STUDY RESULTS

The main objective of the baseline survey is to provide information on the households, which will give both the implementing agencies as well as the researchers insight into, for example population characteristics, tenure situation, communication and consultation preferences as well as, of course, serving as a benchmark in comparing the data collected at endline (estimating of the effect of the ProPFR programme by accounting for part of the variation in endline variables).

The analysis in this report serves two main purposes, describing the socioeconomic profile, as well as other land related variables, of potential project beneficiaries and comparing households in the treatment PFR villages and the control.

In the tables which follow, we calculate statistics incorporating sampling weights to adjust for the relative probability of selection of a household. Where villages contain fewer buildings, any given building is more likely to be selected given that we interview an equal number of households per village. By weighting each household’s response with the number of households selected divided by the number of eligible buildings in the village enumeration area we correct for this issue. This means the data should be more representative of the units of disaggregation we consider. One more issue

remains, namely that households who own more buildings are more likely to be selected. We do not have data on this so cannot currently correct for this issue, but plan to collect this information at endline to avoid bias in the impact evaluation estimates.

The reader should also note that our sample is designed to select households in control villages who are similar to those in the selected villages. This means that the statistics provided are representative only for villages likely to be targeted by ProPFR and not for the communes or department of Borgou as a whole.

In what follows we consider descriptive statistics disaggregated at various levels. Much of the data is displayed by commune, allowing us to gain a broad impression of the geographical differences in economic and cultural outcomes. This is complemented by a finer geographical analysis at the cluster level (as defined previously in [Table 2](#)), in which we group the treatment villages as assigned by the ProPFR along with our control villages which were matched in the same cluster. This information should serve to help the implementing agencies identify areas in which they may face specific challenges in the implementation of the PFRs.

Also of interest are the differences in tenure security and other characteristics of migrants vs those whose households have been in the region for longer. Here we define “migrants” as households whose heads state that they do not come from the department of Borgou. We make this choice after considering the risk of plot loss, which is significantly positively correlated with these two categories of migrants, but not with those who have moved within the commune or the department. Under the finer classification of the origins of respondents, those from the village make up the majority of the sample (75% after adjusting for sample weights). We also choose to provide some key differences between male and female headed households given that the targeting of women plays a large role in the ProPFR programme.

BACKGROUND CHARACTERISTICS

5.1 SOCIOECONOMIC PROFILE OF THE RESPONDENTS

Here we can observe levels of household characteristics to gain a better understanding of the households in the sample as well as differences between the provinces. We split these characteristics into sociodemographic, economic status and land ownership variables. In each case we show the characteristics by commune and as a total for the whole sample.

SOCIODEMOGRAPHIC CHARACTERISTICS

As can be seen in [Table 6](#) the largest ethnic group across our whole sample is Peulh and related (42%), accounting for almost half of the household heads and almost exactly half the household members. This varies by commune considerably, with Tchaourou home to the fewest Peulh (9%) and Kalalé to the highest percentage (80%). It is followed by Bariba and related, accounting for more than one third (36%) of the households (though far fewer in Kalalé at 12%). The dominant religion is Islam, with around 70% of the households following this religion. Christianity is more present in Tchaourou (44%) but represents a minority in the north.

A household has an average of 6.25 members, while the median household has 6 members when accounting for weights. This value masks a small number of very large households, with 10% of households having 12 members or more and the largest declared to include 43 members.

The level of education among the household heads is low, with 80% declaring that they received no education while only around 10% completed secondary school or higher. 76% of household heads declare that they are illiterate (cannot read nor write), which is worse in Bembéréké (83%) and better in Tchaourou (64%), though still relatively high.

Table 6 – Social Demographics by Commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
N	951	672	674	671	2968
Ethnicity					
Adja and related	0.2%	0.1%	0.9%	1.9%	0.9%
Bariba and related	39.3%	11.9%	48.4%	32.8%	36.1%
Dendi and related	0.6%	1.9%	0.3%	1.2%	0.9%
Fon and related	0.9%	0.5%	0.4%	2.6%	1.2%
Yoa-Lokpa and related	0.1%	0.1%	0.8%	5.7%	1.9%
Bétammaribè and related	2.0%	0.3%	3.1%	9.6%	4.2%
Peulh and related	52.4%	80.3%	43.3%	8.8%	41.7%
Yoruba and related	0.4%	2.6%	0.6%	34.6%	10.3%
Gua or Otamari and related	3.4%	0.2%	0.2%	1.6%	1.5%
Other ethnicity	0.4%	0.7%	1.4%	0.9%	0.9%
Neighbouring countries	0.2%	1.1%	0.7%	0.1%	0.5%
Other countries	0.0%	0.2%	0.0%	0.1%	0.1%
HH size (mean)	7.614	7.186	6.426	5.409	6.582
HH head illiterate	81.9%	76.2%	79.1%	62.6%	74.9%
HH head age (mean)	45.5	45.41	46	45.81	45.72
HH head Muslim	71.1%	93.6%	70.1%	52.6%	69.0%
HH head Christian	21.4%	5.3%	22.6%	44.1%	25.6%

The majority of sampled households have male heads (90%) as can be seen in [Table 7](#), with an average age of the household head of about 46, though female household heads are on average almost 8 years older. Female headed households have a higher proportion of Yoruba (20% vs 9% in male headed households). The households of male heads are larger (6.9 members on average) than female headed households (4.2 members) and more female heads are illiterate (87% vs 74%). Female heads are on average older (52 years vs 45) and more likely to be Christian than their male counterparts.

While around 62% of household heads are in marriages involving one wife, polygamy is fairly widespread with 22% of respondents declaring to be in unions with two or more wives. 48% of female household heads are widows (2% of the male household heads are widowers), 11% divorced and only 31% are married. The female widows are on average 61 years old while those not widowed are younger at 44, showing as expected that widows are on average older.

We also consider the differences in the origin of the household heads by gender below, where we see that female household heads are 8 percentage points less likely to be from the village they are now living in and 5.1 percentage points more likely to be from another village in the commune, which are significant at the 5% level. This suggests that women are more mobile within the commune, while men remain in their village of birth, possibly related to marriage practices. The movement of women when they marry is likely linked to the level of land security. On the one hand, those moving in from outside the village are less likely to have secure access to land, while on the other if a woman is more likely to move away (possibly to marry) then there is less need for secure land rights. The differences between male and female in the categories for coming from outside the commune or the department are not significantly different.

Table 7 - Social Demographics by HH Head Gender

	HH head gender		Total
	Male	Female	
N	2673	295	2968
<i>Ethnicity</i>			
Adja and related	0.9%	0.9%	0.9%
Bariba and related	35.0%	45.6%	36.1%
Dendi and related	0.9%	0.8%	0.9%
Fon and related	1.1%	1.5%	1.2%
Yoa-Lokpa and related	2.0%	1.1%	1.9%
Bétammaribè and related	4.3%	3.5%	4.2%
Peulh and related	43.7%	24.4%	41.7%
Yoruba and related	9.2%	20.4%	10.3%
Gua or Otamari and related	1.5%	0.8%	1.5%
Other ethnicity	0.9%	0.6%	0.9%
Neighbouring countries	0.5%	0.0%	0.5%
Other countries	0.0%	0.3%	0.1%
<i>Origin</i>			
This village	75.8%	67.8%	74.9%
Another village in the commune	5.5%	10.6%	6.0%
Another village outside the commune	4.1%	6.3%	4.3%
Another village outside the department	12.3%	14.3%	12.5%
From another African country	2.4%	1.0%	2.3%
HH size (mean)	6.859	4.192	6.582
HH head illiterate	73.5%	86.6%	74.9%
HH head age	44.96	52.29	45.72
HH head Muslim	69.9%	61.3%	69.0%
HH head Christian	24.8%	32.6%	25.6%

There are clear differences between the clusters even within a commune. The number of Peulh varies considerably by cluster, and within Tchaourou cluster 11 has Bariba as its major ethnicity and a large number of other ethnicities which do not play a major role in other clusters. In particular, Bétammaribè make up almost 20% of the population in cluster 11, but not more than 4% elsewhere. Further to the south in cluster 10 there are considerably more Yoruba, at over 60% of the population. The result that literacy is higher in Tchaourou as a whole remains, with both clusters performing well in this regard. Literacy may have helped household heads in the process to pursue documentation for their fields. The two variables are significantly positively correlated, though the regression coefficient is no longer significant when clustering standard errors by village. This suggests that households with literate households were indeed more likely to have documentation for any given plot.

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Table 8 - Sociodemographic Characteristics by Cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
N	334	395	224	224	336	112	224	224	224	336	335	2968
<i>Ethnicity</i>												
Adja and related	0.2	0.3	0.0	0.2	1.0	1.2	0.0	0.0	0.3	1.9	2.0	0.9
Bariba and related	48.4	40.0	35.8	29.7	41.5	71.1	17.2	10.9	5.9	26.4	43.3	36.1
Dendi and related	0.4	0.8	0.5	0.3	0.4	0.0	3.0	1.7	0.8	1.1	1.5	0.9
Fon and related	1.0	0.9	0.5	0.6	0.3	0.6	0.7	0.3	0.3	3.1	1.7	1.2
Yoa-Lokpa and related	0.4	0.0	0.0	0.9	0.6	1.2	0.0	0.3	0.0	4.9	7.2	1.9
Bétammaribè and related	3.8	1.1	0.0	4.0	2.3	4.2	0.8	0.0	0.0	1.4	22.9	4.2
Peulh and related	39.4	55.7	61.4	61.9	50.2	14.8	71.5	80.8	91.0	6.4	12.8	41.7
Yoruba and related	0.6	0.6	0.0	0.0	0.4	1.2	3.0	4.4	0.7	54.5	2.2	10.3
Gua or Otamari and related	4.4	0.7	0.4	0.0	0.4	5.6	0.4	0.3	0.0	0.3	3.7	1.5
Other ethnicity	0.8	0.0	1.0	1.3	2.2	0.0	1.8	0.0	0.0	0.1	2.1	0.9
Neighbouring countries	0.6	0.0	0.5	1.1	0.8	0.0	1.3	1.0	0.9	0.0	0.2	0.5
Other countries	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.3	0.1
HH size (mean)	8.342	6.326	9.047	6.902	6.863	6.125	6.362	7.091	8.322	5.040	6.014	6.582
HH head illiterate	80.7%	81.2%	82.8%	82.7%	83.1%	70.1%	78.1%	78.8%	71.6%	64.4%	59.7%	74.9%
HH head age	47.40	44.36	46.06	44.22	47.04	45.60	43.95	46.96	45.98	46.21	45.17	45.72
HH head Muslim	63.8%	73.6%	89%	74.7%	76.6%	48.2%	93.1%	94.1%	93.8%	49%	58.5%	69%
HH head Christian	29.8%	17.5%	8.96%	21.3%	17.9%	36.3%	5.87%	4.74%	4.95%	48.8%	36.5%	25.6%

Nearly one sixth of the sample are migrants, which after weighting accounts for 14.8% of the villages sampled. As one might expect, households headed by migrants from outside the department do not fit the typical ethnic profile of Borgou. Far fewer of the migrants are Bariba, while significantly more are Yoa-Lokpa (12.7%) or Bétammaribè (24.7%). The other minority ethnicities also make up a larger proportion of the migrants. Of the migrant household heads, fewer are illiterate, and fewer are Muslim. Migrants appear to be better educated than those who are originally from the region. The size of the households also appears to be a little smaller for migrant led households.

Table 9 - Sociodemographic Characteristics by Migrant Status

	Migrant Status		Total
	Non-Migrant	Migrant	
N	2561	407	2968
Weighted %	85.2%	14.8%	
Ethnicity			
Adja and related	0%	5.6%	0.9%
Bariba and related	40.6%	9.9%	36.1%
Dendi and related	0.5%	3.4%	0.9%
Fon and related	0.1%	7.3%	1.2%
Yoa-Lokpa and related	0%	12.7%	1.9%
Bétammaribè and related	0.6%	24.7%	4.2%
Peulh and related	47.3%	9.7%	41.7%
Yoruba and related	10.2%	10.9%	10.3%
Gua or Otamari and related	0.2%	8.6%	1.5%
Other ethnicity	0.4%	3.7%	0.9%
Neighbouring countries	0%	3.1%	0.5%
Other countries	0%	0.5%	0.1%
HH size (mean)	6.774	5.472	6.582
HH head illiterate	78.20%	55.70%	74.90%
HH head age (mean)	46.42	41.71	45.72
HH head Muslim	74%	40.20%	69%
HH head Christian	21.30%	50.60%	25.60%

In our sample, 29 household heads claim to be the village chief or a delegate, which are in 4 of the 7 clusters with at most 3 from one village (Bouratébé). We have at least one such chief/delegate in 25 of the 53 villages in the sample. A further 73 state they are “Conseiller du village” (village councillors) and another 80 are elders of the village. 29 respondents claim to be the religious or customary chief (only 1 of these is also the village chief/delegate). Only two respondents claimed to be members of an SVGF, neither of whom were the chef de village. These individuals with responsibility, who are likely to be well informed can be used to consider some issues later in the report.

ECONOMIC STATUS OF THE HOUSEHOLDS

In the majority of households, the main employment of the household head is as a farmer/working on the family farm at 74.5%. Of the household heads interviewed, 95% state that they earn an income. Of those not earning an income from their primary employment 34% are working as farmers, seemingly without selling any of their produce for money, while 39% are inactive due to age/retired. 6% respectively are handicapped or work only in the home and 5% are studying. The other categories do not reach 1%. Noticeably more household heads work as a businessman or merchant in Kalalé and Tchaourou, with cluster 10 in the south of Tchaourou with the highest proportion of businessmen household heads. This high proportion of businessmen in cluster 10 also appears linked

to the high proportion of Yoruba ethnicity, whose probability to be merchants or businessmen is high even outside of this cluster. Sinendé has more household heads reporting that they do not earn an income, though in contrast to the claims about employment and business it is in Sinendé and Bembéréké where the most household heads claim to be in the top income bracket¹¹. This is also reflected in the average annual income level of 719 thousand FCFA (roughly 1362 USD in February 2018), using the exact declared income where available and imputing from the bracket for monthly income multiplied by 12 where this is missing (imputing using the middle value from each bracket, using 10,000 FCFA for lowest and 1,000,000 FCFA for the highest bracket). It is worth noting that the income distribution is somewhat right skewed, with the median for the imputed income at 300 thousand FCFA per year (roughly 570 USD). The latest World Bank figures from 2017 list Benin as having GDP per capita of 829 USD¹² which sits between the mean and median income levels in our sample. It is worth noting that the income reported here is for the household head who earns more than the average person within a household. This means that the average per capita income in each household is likely to be lower than the figures reported here and thus these households are likely to be poorer than the average household in Benin. In the data, there are 13,013 individuals who are at least 10 years old, meaning data was collected about their employment. Of these, 7059 work in positions which have the potential to earn income and 5484 state that they did earn some income from their primary employment. These earning individuals earned a weighted average of 521 thousand FCFA annually, meaning the average income per household member is 143 thousand FCFA annually (roughly 271 USD) substantially below Benin's GDP per capita in 2017.

Following the strategy adopted in the DHS, we construct a wealth index as the first component of a principal components analysis and then standardise such that the mean level of wealth index within the sample drawn is equal to zero and the standard deviation equal to one. This means that values close to zero are in effect average for our sample, while those with negative values are worse off. We divide these into quartiles to gain a better understanding of how people of different wealth levels are divided by different characteristics (geographical and otherwise).

Our wealth index includes non-agricultural assets (ranging from items such as chairs and tables to radios and fridges), source of drinking water, dwelling characteristics and access to electricity, as well as agricultural assets such as tractors, livestock ownership and land area owned. In the wealth index the ownership of each animal type is defined as a dummy, following the DHS index. Here we find Bembéréké to be poorest (0.14 standard deviations below the mean) while Tchaourou is the richest (0.25 standard deviations above the mean), as is perhaps made clearer by considering the distribution of households across the wealth quartiles as measured by our index. It can be seen that Tchaourou has fewer very poor and more rich than the average, while Bembéréké has more very poor and fewer in the middle of the distribution. These differences in wealth contrast with the findings for income for which the lowest earning household heads are in Kalalé, closely followed by Tchaourou and highest in Sinendé with Bembéréké not too far behind.

¹¹ Most household heads report their annual income directly, but where they refused or were uncertain reported a bracket for their last monthly income. For both monthly and annual income these data are combined. For annual income the small number of monthly income brackets are used. For monthly we take one twelfth of the yearly income or the mid-point of the bracket where the annual income is missing.

¹² World Bank World Development Indicators - Retrieved from <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=BJ> (Accessed on 07.12.18)

Table 10 - Economic Status by Commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Employment					
Farmer/Worker in the family farm	81.4%	70.1%	77.7%	66.8%	74.5%
Business/Merchant	2.0%	12.4%	3.8%	13.5%	7.3%
Other	12.0%	12.1%	13.7%	13.2%	12.9%
Does not work	4.5%	5.4%	4.8%	6.5%	5.3%
N	948	668	669	665	2950
Head Income (monthly)					
No income	8.1%	7.0%	14.9%	11.4%	10.9%
Moins de 15 000 FCFA	22.4%	23.3%	17.0%	33.2%	23.9%
[15 000; 27 500 [	14.1%	20.3%	13.0%	21.1%	16.7%
[27 500; 44 000 [	18.5%	22.5%	15.6%	15.8%	17.5%
[44 000; 88 000 [	18.8%	20.5%	16.5%	11.9%	16.5%
[88 000; 176 000 [	10.1%	4.7%	12.9%	3.3%	8.2%
[176 000; 352 000 [	4.5%	1.3%	6.6%	1.6%	3.8%
[352 000; 704 000 [	2.2%	0.3%	2.2%	1.0%	1.6%
Plus de 704 000 FCFA	1.2%	0.1%	1.4%	0.7%	0.9%
Imputed annual income (thousand FCFA)					
Mean	859.3	465.1	935.4	486.1	718.8
Median	400	310	400	200	300
N	951	672	674	671	2968
Home owner	76.8%	70.5%	67.8%	66.3%	70.9%
N	951	672	674	671	2968
Wealth Index (standardised)	-0.141	-0.0157	-0.0298	0.246	7.95E-11
Wealth quartile					
Very poor	35.80%	30.0%	19.0%	18.6%	25.4%
Poor	23.5%	31.0%	28.7%	20.8%	25.4%
Rich	16.7%	20.7%	26.3%	32.8%	24.4%
Very rich	24.0%	18.3%	26.1%	27.8%	24.7%
N	677	502	451	459	2089

In Bembéréké, Sinendé and Kalalé there are no clear differences in employment sector of household heads between the clusters within each commune. In Tchaourou, however, there are noticeably more businessmen/merchants in cluster 10 and fewer working in agriculture than in cluster 11. In terms of income and wealth there are differences even within communes. Cluster 2 in Bembéréké is poorer both in terms of income and wealth than the other clusters in the commune. Commune 1 has considerably more wealth than cluster 2 with cluster 3 (Bem G2 and G3) somewhere between in terms of wealth. Commune 6 in Sinendé as well as commune 10 in Tchaourou are also noticeably wealthier than the average in our sample. Communes 7 and 9 (Kalalé G1 and G3) are poor in terms of wealth with incomes of household heads in communes 7 and 8 lower than the sample average.

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Table 11 - Economic status by cluster

	Cluster											Total
	Bem G1	Bem G2	Bem G3	Sin G1	Sin G2	Sin G3	Kal G1	Kal G2	Kal G3	Tch G1	Tch G2	
Employment												
Farmer/Worker in the family farm	84.40%	78.60%	80.10%	81.50%	75.70%	79.80%	65.70%	73.80%	72.70%	64.00%	71.50%	74.50%
Business/Merchant	2.50%	1.40%	3.40%	4.00%	2.80%	5.50%	13.00%	10.50%	13.10%	16.00%	9.30%	7.30%
Other	8.90%	13.70%	12.70%	12.60%	17.20%	8.50%	18.10%	7.30%	8.70%	12.80%	13.90%	12.90%
Does not work	4.20%	6.30%	3.80%	1.90%	4.30%	6.20%	3.30%	8.40%	5.50%	7.30%	5.30%	5.30%
Head Income												
No income	5.1%	11.8%	9.8%	16.8%	13.6%	11.0%	5.2%	11.0%	5.8%	12.3%	9.8%	10.9%
Moins de 15 000 FCFA	15.3%	26.5%	16.0%	23.6%	18.3%	10.3%	29.2%	19.6%	18.9%	35.0%	30.2%	23.9%
[15 000; 27 500 [	12.7%	10.0%	13.7%	11.9%	11.6%	27.2%	18.0%	25.1%	19.4%	20.5%	22.1%	16.7%
[27 500; 44 000 [	21.3%	15.8%	22.5%	14.0%	13.9%	21.0%	25.0%	20.7%	20.7%	14.6%	17.8%	17.5%
[44 000; 88 000 [	23.9%	18.6%	20.8%	13.7%	14.5%	16.7%	19.8%	16.7%	24.5%	11.1%	13.2%	16.5%
[88 000; 176 000 [	12.3%	9.2%	12.9%	10.0%	15.3%	9.0%	1.9%	5.0%	7.9%	2.4%	4.8%	8.2%
[176 000; 352 000 [	5.2%	4.5%	2.5%	4.8%	9.1%	3.6%	0.5%	1.3%	2.4%	1.8%	1.2%	3.8%
[352 000; 704 000 [	3.6%	1.5%	1.3%	2.6%	2.5%	1.2%	0.4%	0.3%	0.3%	1.4%	0.2%	1.6%
Plus de 704 000 FCFA	0.4%	2.1%	0.5%	2.6%	1.1%	0.0%	0.0%	0.3%	0.0%	0.8%	0.7%	0.9%
Imputed annual income (thousand FCFA)												
Mean	957.5	891.3	710.8	983.1	1014.4	608.8	394.0	481.1	542.6	502.0	460.0	718.8
Median	500	400	467	300	500	345	300	300	400	180	240	300
N	334	394	224	223	336	112	224	223	224	335	334	2963
Home owner	69.3%	82.2%	78.7%	63.8%	71.2%	66.5%	71.9%	78%	65.9%	57.7%	79.7%	70.6%
N	334	395	224	224	336	112	224	224	224	336	335	2968
Wealth index (standardized)	0.212	-0.323	-0.0249	0.0134	-0.0676	0.170	-0.172	-0.0640	-0.236	0.239	-0.0013	-0.0244
Wealth quartile												
Very poor	25.4%	40.5%	24.8%	20.5%	22.9%	15.1%	34.0%	27.1%	27.2%	11.6%	27.5%	25.4%
Poor	18.2%	24.8%	25.3%	20.0%	32.1%	33.8%	28.5%	28.9%	36.6%	20.7%	20.9%	25.4%
Rich	23.0%	15.7%	22.7%	34.5%	21.4%	19.3%	17.1%	23.7%	22.8%	36.4%	28.3%	24.4%
Very rich	33.3%	19.0%	27.2%	25.1%	23.6%	31.8%	20.5%	20.3%	13.4%	31.3%	23.4%	24.7%
N	226	308	147	145	231	71	172	173	157	196	263	2089

The Peulh people are known to be a more nomadic people herding cattle than the other ethnicities in the region. This differentiation is not possible from the question on employment as tending to animals was entered under the same category as working in the fields on growing crops. Both the Bariba and the Peulh have a high proportion working as farmers, though the Yoruba have fewer farmers and more businessmen/merchants. The Yoruba appear to have lower incomes but more wealth, reflected by assets but not home ownership which is 10-12 percentage points below the home ownership rates of the Peulh and Yoruba, at 74% and 72% respectively. Livestock ownership is included in the wealth index but is considered in more detail in section 5.6.

Table 12 - Economic Status by Main Ethnicities

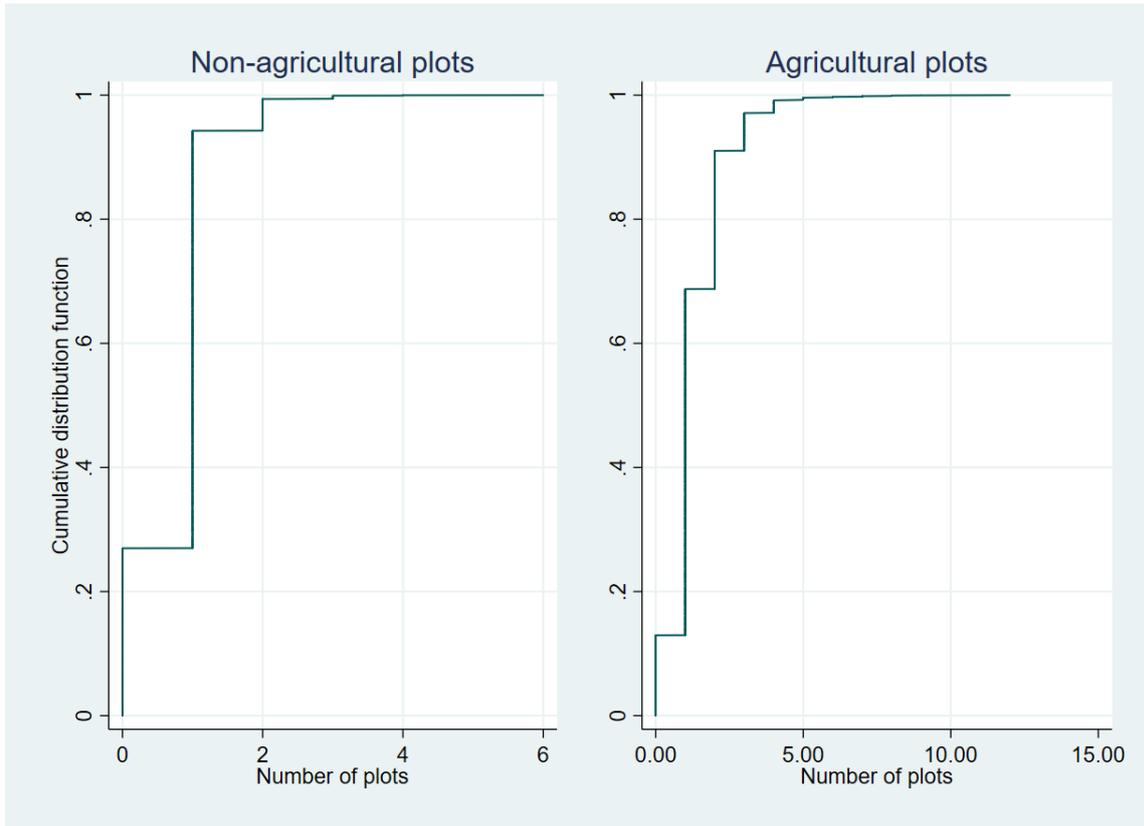
	Ethnicity				Total
	Bariba	Peulh	Yoruba	Other	
Employment					
Farmer/Worker in the family farm	80.9%	75.0%	59.2%	66.8%	74.5%
Business/Merchant	5.5%	4.5%	16.9%	14.4%	7.3%
Other	7.6%	15.4%	16.3%	16.9%	12.9%
Does not work	6.0%	5.1%	7.6%	1.9%	5.3%
N	1008	1390	238	332	2968
Head Income					
No income	9.9%	13.1%	10.9%	5.8%	10.9%
Less than 15 000 FCFA	2.1%	2.6%	0.0%	2.3%	2.1%
[15 000; 27 500 [	1.7%	2.0%	2.5%	3.5%	2.1%
[27 500; 44 000 [	1.3%	1.3%	1.0%	2.1%	1.4%
[44 000; 88 000 [	6.2%	5.3%	15.1%	7.8%	6.9%
[88 000; 176 000 [	9.9%	9.7%	17.6%	14.2%	11.1%
[176 000; 352 000 [	17.4%	17.2%	18.5%	25.3%	18.4%
[352 000; 704 000 [	21.0%	22.7%	21.0%	18.2%	21.4%
More than 704 000 FCFA	30.5%	26.0%	13.3%	20.8%	25.7%
Imputed annual income (thousand FCFA)					
Mean	659.4	525.1	346.7	481.8	549.9
Median	372	350	200	240	300
N	1008	1390	238	332	2968
Homeowner	72.4%	74.3%	62.5%	59.5%	70.6%
N	1008	1390	238	332	2968
Wealth Index (standardised)	0.332	-0.444	0.469	-0.108	-0.0244
Wealth quartile					
Very poor	11.9%	40.4%	4.8%	33.6%	25.4%
Poor	23.3%	31.0%	16.8%	19.6%	25.4%
Rich	29.2%	18.4%	36.4%	20.3%	24.4%
Very rich	35.6%	10.1%	42.0%	26.5%	24.7%
N	749	967	148	225	2089

LAND OWNERSHIP & USE

Households report owning or cultivating on average 1.3 plots and owning 0.8 non-agricultural plots. Figure 10 displays the distribution of number of plots by households. There is very little variation in the number of non-agricultural plots with virtually all households reporting one plot or fewer (92%) and 27% not owning a non-agricultural plot. More variation is observed for agricultural plots with around one third owning more than one plot.

The number of agricultural plots varies a little between communes. Households in Kalalé and Bembéréké report slightly more agricultural plots. The maximum number of plots of any household is 6 for non-agricultural and 12 for agricultural, with both present in Bembéréké in cluster 1. Following cluster 1, cluster 9 (Kal G3) also has a higher number of agricultural plots than average. Within Sinendé, it is cluster 6 which has a higher number of agricultural plots, which is the village Toumé of the selected ProPFR villages. The 3 clusters in Kalalé all appear different in the number of agricultural plots, suggesting that each differs in its character.

Figure 10 - Distribution of number of plots



In our sample households either rent or own plots, never a mixture of the two. Of those who are working an agricultural plot (2599 households report this) there are only 132 who do not own the plot they are working on.

Figure 11 - Plots Reported by Commune

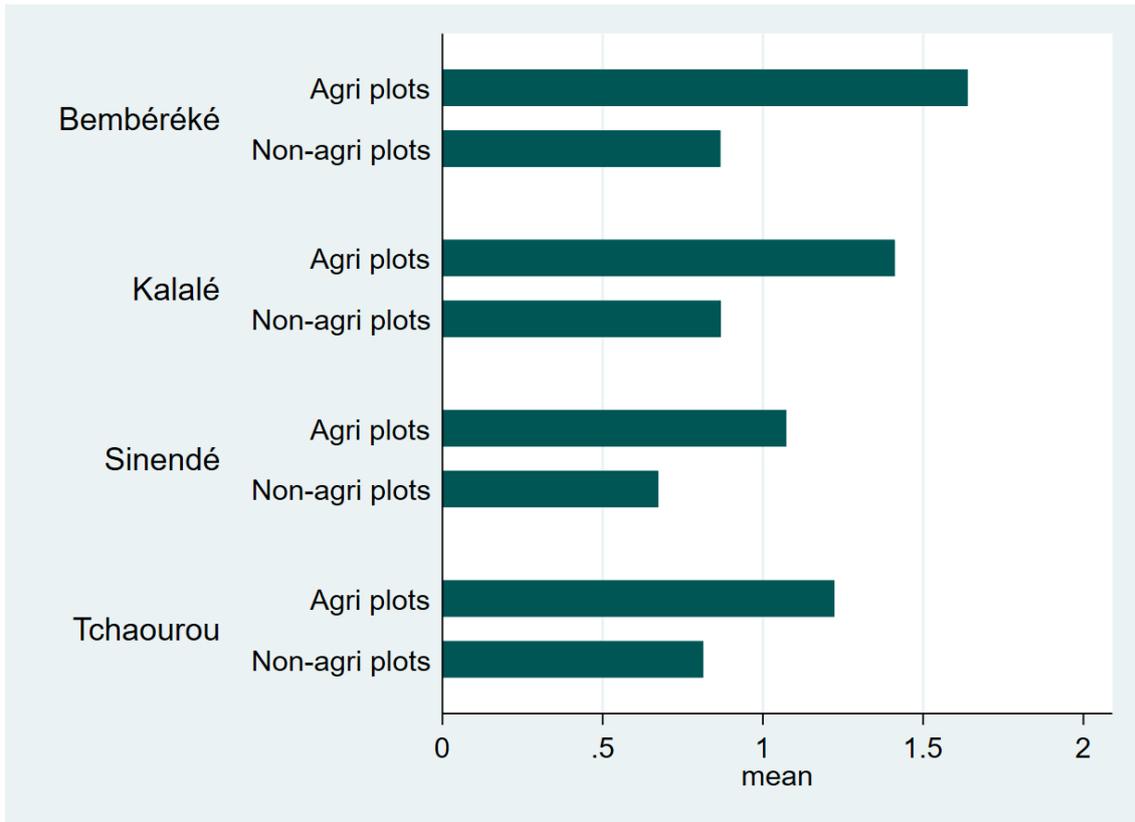


Figure 12 - Plots Reported by Cluster

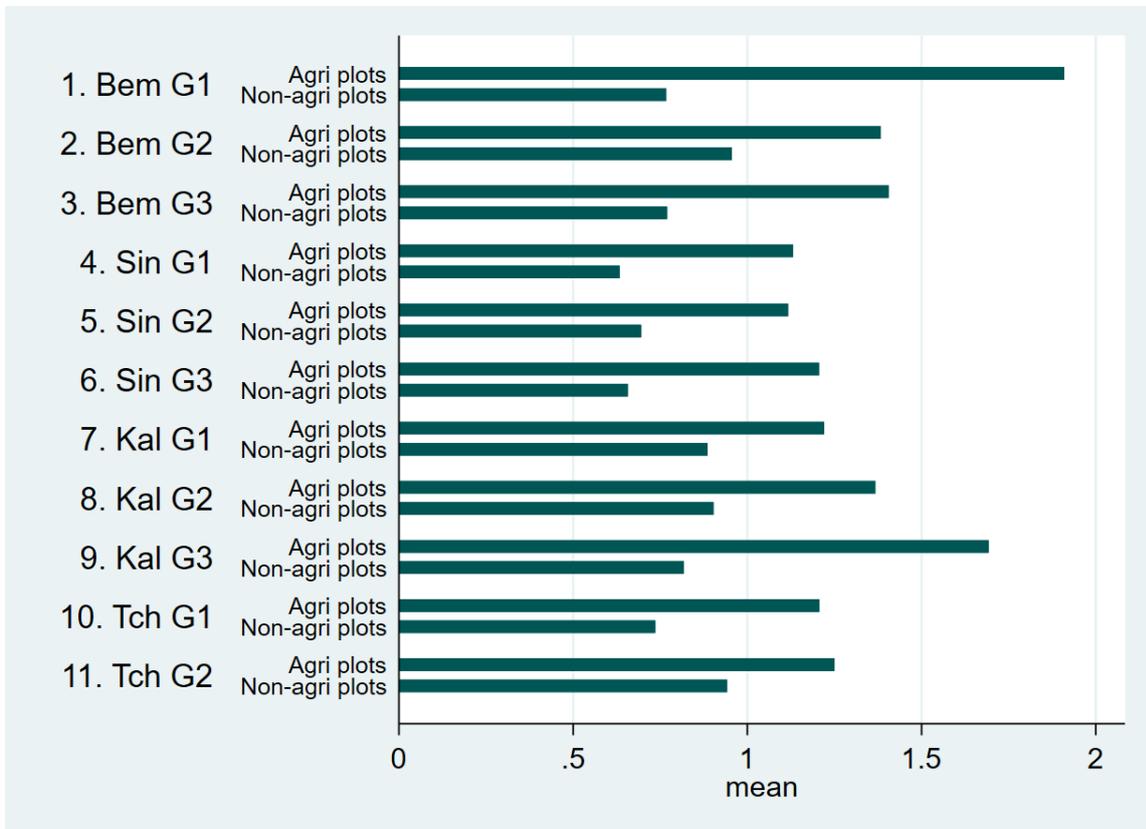


Figure 13 displays the cumulative distribution of self-reported plot sizes. Note that self-reported plot sizes are available for agricultural plots whether these plots are owned or used by the household, while households were asked to report the size of their non-agricultural plots only when they own the plot. As for the number of plots, there is little variation in the size of plots between households for non-agricultural plots, with almost all plots having a small area, while the distribution shows more variation for agricultural plots. Overall, 50% of the plots are 3 ha or smaller and 90% are 11 ha or smaller, while only 5% of plots are larger than 15 ha. Not only do households in Bembéréké report using more plots, but those plots are also reported to be larger (using self-reported sizes, trimming the top 1%), averaging 5.7 ha, 1 ha more than the average for the whole sample. Most plots are declared to be within the village boundaries and the majority of agricultural plots are currently being used for cultivation and non-agricultural plots being used for habitation. In addition, we compare quartiles of the distance between plots and household residence. It appears that agricultural plots are on average closer to the household residence in Kalalé while further away in Tchaourou. 21% of plots have their boundaries marked, though there are differences between communes where Tchaourou and Sinendé have a higher proportion with the boundaries marked. Again, for non-agricultural plots, the largest size of plots is in Bembéréké, though in this case Sinendé has the smallest plots.

Figure 13 - Distribution of plot size (self-reported)

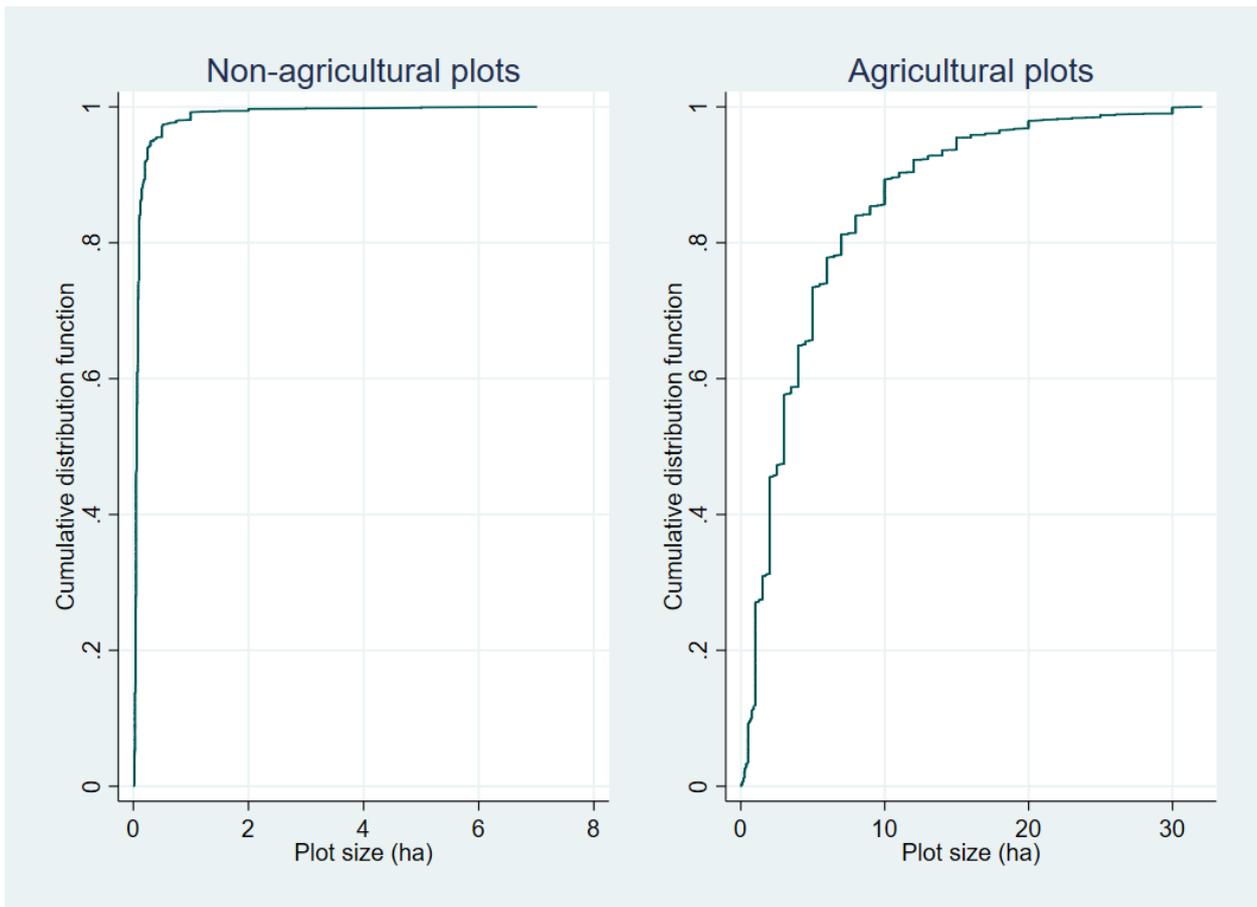


Table 13 - Plots declared by Commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<i>Agricultural plots</i>					
N	1622	1041	810	877	4350
Average N plots	1.6	1.4	1.1	1.2	1.3
Average Size (ha)	5.7	3.1	6.0	3.1	4.7
Plot in village	98.5%	97.6%	98.2%	97.4%	98%
<u>Plot distance</u>					
<u>Quartiles</u>					
0m-600m	27.3%	29.4%	28.5%	10.1%	23.3%
600m-1700m	24.8%	28.6%	19.3%	32.6%	26.4%
1700m-3400m	22.7%	26.7%	25.3%	31.8%	26.4%
>3400m	25.3%	15.3%	26.9%	25.4%	24.0%
Main use: Agriculture	97.9%	97.6%	99.8%	98.9%	98.6%
Plot boundary marked	17.8%	15.4%	29.6%	20.8%	21%
<i>Non Agricultural plots</i>					
N	813	585	459	541	2398
Average N plots	0.9	0.9	0.7	0.8	0.8
Average Size (ha)	0.2	0.2	0.1	0.1	0.1
Plot in village	92.3%	97.5%	96.1%	90.6%	93.6%
Main use: Habitation	93.1%	96.5%	95.8%	89.5%	93.3%

Households in cluster 1 in Bembéréké have more agricultural plots on average than elsewhere, with the size of these plots also high in the distribution of average sizes by cluster. The village of Bérou has the most agricultural plots per household. The largest average plot size is in Sinendé in cluster 3, with Wari Gando standing out as having the largest plots on average. A greater percentage of agricultural plots further away from the household can be found in clusters 1 and 3 in Bembéréké and in cluster 1 in Sinendé.

From [Table 15](#) it is clear that female household heads work or own fewer agricultural plots, which is driven by the fact that 45% of female headed households work no agricultural plots, while only 9% of male headed households report no plots. Even for the plots owned, the average declared size differs dramatically, with women worse off. Female household heads' agricultural plots are on average slightly further away from household residence than male headed households' plots. It is also worth noting that women headed households are more likely to have marked the plot boundary, which may indicate that they understand the need to protect their land lest they have it taken away from them. A similar pattern arises for non-agricultural plots, with female household heads owning fewer plots on average a fewer percentage of which being in the village, in comparison with male household heads.

Migrant households own on average fewer agricultural plots and these plots are of a lower size and further from household residence than those of non-migrant households. Migrant households also own on average slightly fewer non-agricultural plots, a greater percentage of which are outside the village and not being used for habitation. This suggests that some of these households may have kept land in their village of origin.

Table 14 - Plots by Cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Agricultural plots												
N	652	592	337	267	410	174	297	344	400	429	448	4350
Average N plots	1.9	1.4	1.4	1.1	1.1	1.2	1.2	1.4	1.7	1.2	1.3	1.3
Average Size (ha)	6.0	5.2	6.3	7.0	5.2	6.9	2.8	3.0	3.4	2.1	4.7	4.7
Plot in village	99.5%	97.4%	98.8%	96.3%	98.9%	99.5%	98.5%	95.3%	98.3%	98.7%	95.4%	98%
Plot distance (Quartiles)												
0m-600m	21.5%	31.4%	27.6%	17.1%	40.7%	22.5%	26.2%	35.5%	28.2%	6.6%	15.7%	23.3%
600m-1700m	19.2%	30.5%	16.8%	19.3%	16.9%	26.8%	17.8%	34.3%	34.8%	34.6%	29.5%	26.4%
1700m-3400m	26.4%	20.6%	19.6%	22.4%	21.4%	31.7%	28.2%	23.2%	27.7%	35.7%	25.6%	26.4%
>3400m	32.9%	17.5%	35.9%	41.2%	21.0%	19.0%	27.9%	7.0%	9.3%	23.1%	29.2%	24.0%
Main use: Agriculture	97.8%	99.4%	97%	99.9%	99.7%	96.7%	98.2%	97.5%	97.1%	99.1%	98.7%	98.6%
Plot boundary marked	18.3%	20.8%	23.6%	13.5%	32.2%	27.3%	11.3%	20.6%	15.5%	12%	34.6%	21%
Non Agricultural plots												
N	273	374	170	141	236	78	198	205	182	229	312	2398
Average N plots	0.8	1.0	0.8	0.6	0.7	0.7	0.9	0.9	0.8	0.7	0.9	0.8
Average Size (ha)	0.2	0.1	0.4	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Plot in village	95.8%	89.4%	96.1%	100%	94.2%	97.4%	98%	98.3%	96%	89%	92.6%	93.6%
Main use: Habitation	90.8%	93.6%	95.4%	98.8%	95.8%	93.6%	98.4%	96.1%	94.2%	86.7%	93.2%	93.3%

Table 15 – Plots by Gender of HH head

	HH head gender		Total
	Male	Female	
Agricultural plots			
N	4016	334	4350
Average N plots	1.4	0.7	1.3
Average Size (ha)	5.1	2.0	4.9
Plot in village	97.8%	97.9%	97.8%
Plot distance (Quartiles)			
0m-600m	23.7%	15.5%	23.3%
600m-1700m	25.5%	41.2%	26.4%
1700m-3400m	26.4%	25.9%	26.4%
>3400m	24.4%	17.3%	24.0%
Main use: Agriculture	99.1%	99.4%	99.1%
Plot boundary marked	21.3%	27.3%	21.7%
Non Agricultural plots			
N	2218	180	2398
Average N plots	0.8	0.5	0.8
Average Size (ha)	0.1	0.1	0.1
Plot in village	95.7%	92.2%	95.4%
Main use: Habitation	95.2%	93.1%	95%

Table 16 - Plots by Migration Status

	Migrant Status		Total
	Non Migrant	Migrant	
Agricultural plots			
N	3843	507	4350
Average N plots	1.4	1.0	1.3
Average Size (ha)	5.2	3.2	4.9
Plot in village	98%	96.6%	97.8%
Plot distance (Quartiles)			
0m-600m	24.2%	15.9%	23.3%
600m-1700m	25.8%	30.5%	26.4%
1700m-3400m	26.3%	26.9%	26.4%
>3400m	23.7%	26.8%	24.0%
Main use: Agriculture	99.2%	98.9%	99.1%
Plot boundary marked	22.4%	17.3%	21.7%
Non Agricultural plots			
N	2097	301	2398
Average N plots	0.8	0.7	0.8
Average Size (ha)	0.1	0.1	0.1
Plot in village	97.1%	84.5%	95.4%
Main use: Habitation	95.7%	91%	95%

INPUTS

The ProPFR programme aims to raise the level of awareness about the PFR and land law as well as implementing a PFR in each of the selected villages for treatment. Prior to the start of this programme, it is useful to see how much the population knows about the land code as well as PFRs and ADCs.

5.2 AWARENESS OF PFR AND LEGAL SYSTEM

In order for households to assert their formal rights over land, they must be aware to some extent of what they are entitled to and what is protected by the law. We asked respondents a number of questions around this issue.

INFORMATION ON PFR AND CFD

Table 17 - Knowledge of new land code

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Heard of new land code (CFD)	291 30.6%	150 22.3%	139 20.6%	47 7%	627 21.1%
Source					
Radio	218 74.91%	103 68.67%	109 78.42%	32 68.09%	462 73.68%
TV	8 2.75%	2 1.33%	3 2.16%	0 0.00%	13 2.07%
Friend	39 13.40%	25 16.67%	10 7.19%	6 12.77%	80 12.76%
NGO	4 1.37%	1 0.67%	8 5.76%	0 0.00%	13 2.07%
Village association	14 4.81%	8 5.33%	4 2.88%	3 6.38%	29 4.63%
Other	8 2.75%	11 7.33%	5 3.60%	6 12.77%	30 4.78%

Here, it is instructive to consider the awareness of the new land code and the PFR both by commune and by treatment status. It is worth noting that the SVGFs had been installed across Bembéréké and as such it comes as no surprise that awareness of the new CFD is higher there, though not significantly more than Kalalé or Sinendé. It is noticeably lower in Tchaourou, which is significantly different from the other communes. In all communes, the radio is the most common source of knowledge of the new CFD with around 70% of those who have heard about the land code hearing about it on the radio. Transmissions of information began in June 2017, with all villages being reached prior to our baseline. The clusters in the south of Bembéréké seem to be the best informed of the new land code. Cluster 6 includes a village in Sinendé and one in Bembéréké and it is the village in Bembéréké (the control village) with the better knowledge.

Table 18 - Awareness of CFD by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
N	334	395	224	224	336	112	224	224	224	336	335	2968
Heard of new land code	36.4%	19.5%	34.1%	18.1%	21.4%	37.1%	22%	21.8%	14.9%	9.61%	7.29%	20%
Source												
Radio	75.8%	58.9%	75.9%	82.5%	77.4%	92.2%	78.8%	69.1%	58.1%	85.0%	69.2%	76.0%
TV	1.6%	6.0%	2.6%	0.0%	4.5%	0.0%	1.2%	3.3%	0.0%	0.0%	0.0%	2.2%
Friend	14.6%	20.6%	10.3%	0.0%	9.5%	3.0%	9.5%	13.9%	26.4%	7.9%	15.3%	11.3%
NGO	1.2%	5.8%	2.6%	8.1%	3.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	2.4%
Village association	5.7%	3.0%	6.0%	6.3%	0.0%	4.8%	2.8%	1.4%	13.2%	1.6%	6.0%	3.9%
Other	1.1%	5.7%	2.6%	3.1%	5.6%	0.0%	7.7%	9.0%	2.3%	5.5%	9.5%	4.1%

Similar numbers have heard of the PFR or the ADC (see [Table 19](#)), though in this case more households who are aware of these land policies can be found not only in Bembéréké but also in Tchaourou. The source of information appears to be quite different, however, with the radio playing an important role in Bembéréké once again but the media seemingly unimportant in Tchaourou. Kalalé seems the least well-informed commune. One potential reason for better knowledge of PFRs could be the proximity to previously implemented PFRs such as the MCA programme. For the clusters in Bembéréké this appears to be the case, but in Tchaourou cluster 10 is closer to previous PFRs while cluster 11 (closer to Parakou) appear to be the better-informed households.

For those respondents who had heard of the PFR or ADC¹³, 59% (13.5% of the total population) claimed that no information meeting about the ADC was held for them to attend. This figure was noticeably higher in Tchaourou, where respondents were either unaware of the meetings occurring, or less information was spread to their commune. For the majority who now state that a meeting occurred but they did not attend, their stated reason was that they did not know it was happening. This suggests that invitations to such meetings were not well spread.

Migrant households may be excluded from such meetings and so we also investigated the difference between migrant and non-migrant households. Knowledge of the land code does not vary by migrant status. Although migrant households are more likely to have heard of the PFR, they are less likely to state meetings were organised or know of information meetings regarding the ADC (given that they know about the PFR). If they knew about the meeting, then the rate of attendance did not differ. For migrants this means that the binding constraint in terms of knowledge of the specific contents of the law (which we do not have information on) is that migrant households are not well informed of meetings arranged for their village.

¹³ The percentages under “Information meeting ADC was organized” of [Table 19](#) sum up to the percentage for “Heard of PFR or ADC”

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Table 19 - Awareness of PFR and ADC

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Heard of PFR or ADC	301	78	108	193	680
	31.7%	11.6%	16%	28.8%	22.9%
<u>Heard about it in the media?</u>					
Yes, on the radio	184	55	90	52	381
	61.13%	70.51%	83.33%	26.94%	56.03%
Yes, on TV	6	1	1	3	11
	1.99%	1.28%	0.93%	1.55%	1.62%
Yes, on the radio and TV	1	1	1	0	3
	0.33%	1.28%	0.93%	0.00%	0.44%
No	110	21	16	138	285
	36.54%	26.92%	14.81%	71.50%	41.91%
<u>Information Meeting ADC was organised</u>					
Yes, in my village	134	21	44	34	233
	14.1%	3.12%	6.52%	5.07%	7.85%
Yes, in another village	22	11	5	7	45
	2.32%	1.64%	0.74%	1.05%	1.52%
No	145	46	59	152	402
	15.27%	6.84%	8.74%	22.68%	13.53%
<u>Participate ADC meetings</u>					
Yes, in my village	78	9	22	17	126
	50.00%	28.13%	44.90%	41.46%	45.32%
Yes, in another village	11	1	4	4	20
	7.05%	3.13%	8.16%	9.76%	7.19%
No	67	22	23	20	132
	42.95%	68.75%	46.94%	48.78%	47.48%
Total (meetings organised)	156	32	49	41	278
<u>If no - Why not?</u>					
No assembly	4	6	2	3	15
	5.97%	27.27%	8.70%	15.00%	11.36%
Too far	6	2	0	2	10
	8.96%	9.09%	0.00%	10.00%	7.58%
Did not know	41	8	10	9	68
	61.19%	36.36%	43.48%	45.00%	51.52%
Not welcomed / invited	5	2	5	3	15
	7.46%	9.09%	21.74%	15.00%	11.36%
Useless	1	0	1	0	2
	1.49%	0.00%	4.35%	0.00%	1.52%
Disagree with these assemblies	1	1	0	2	4
	1.49%	4.55%	0.00%	10.00%	3.03%
Other	9	3	5	1	18
	13.43%	13.64%	21.74%	5.00%	13.64%
Total (did not attend meetings)	67	22	23	20	132
Ever had PFR in Village	17.7%	3.87%	5.79%	4.47%	8.86%

Additionally, the issue of gender appears to play a big role in the awareness of the land code as well as the PFR and ADCs. These can be seen in [Table 20](#) and [Table 21](#) where the percent of female household heads who have heard of the new land code, PFRs or ADCs are significantly different. Of

those who know about the land code, both men and women household heads are most likely to hear about it on the radio. Both male and female household heads are equally likely to have the media as the source of knowledge about the PFR or ADC.

Table 20 - Awareness of CFD by Gender of HH head

	HH head gender		Total
	Male	Female	
N	2673	295	2968
Heard of new land code	21.4%	7.96%	20%
Source			
Radio	76.2%	73.4%	76.0%
TV	1.8%	11.7%	2.2%
Friend	11.5%	7.0%	11.3%
NGO	2.4%	1.6%	2.4%
Village association	4.1%	0.0%	3.9%
Other	4.0%	6.3%	4.1%

Table 21 - Awareness of PFR and ADC by Gender of HH head

	HH head gender		Total
	Male	Female	
N	2673	295	2968
Heard of PFR or ADC	25.1%	10.7%	23.6%
Heard about it in the media?			
Yes, on the radio	55.3%	39.5%	54.5%
Yes, on TV	1.1%	2.4%	1.1%
Yes, on the radio and TV	0.3%	0.0%	0.3%
No	43.3%	58.1%	44.0%
Information Meeting ADC			
Yes, in my village	31.9%	25.6%	31.6%
Yes, in another village	7.1%	4.4%	7.0%
No	61.0%	70.0%	61.4%
Participate ADC meetings			
Yes, in my village	46.2%	26.4%	45.4%
Yes, in another village	9.8%	0.0%	9.4%
No	44.0%	73.6%	45.1%
If no - Why not?			
No assembly	10.0%	0.0%	9.4%
Too far	10.0%	13.2%	10.2%
Did not know	48.9%	42.0%	48.5%
Not welcomed / invited	16.6%	0.0%	15.6%
Useless	1.5%	0.0%	1.4%
Disagree with these assemblies	2.5%	0.0%	2.4%
Other	10.5%	44.8%	12.6%
Ever had PFR if heard of PFR	9.31%	2.58%	8.61%

We also asked whether households believed there had been previous PFR activity in their village (likely through the MCA) with the question “Votre village en particulier fait-il ou a-t-il fait l'objet d'un

PFR?” which more than expected (given the presence of the MCA) answered positively. As was the case with awareness of the existence of the PFR conceptually, it is also the case that more men claim that their village has had a PFR. One noteworthy observation is that the largest number of households claiming to have been the object of a PFR are found in Bembéréké. Below is a table for Bembéréké showing the proportion in each village to claim that their village has ever had a PFR.

The village with the highest percentage is Bouratébé, which under the old village découpage was part of Sombouan, which received an MCA PFR. One of the three household heads who are delegates or the village chief in Bouratébé claimed that a PFR already exists there, while one said there is not and the other had not heard of a PFR.¹⁴ The evidence remains unclear whether the PFR was implemented here and to what extent it covered the village if it did exist at all. This may have to be taken into account when trying to measure the impact of a new PFR, as it could be difficult to separate the effects of the previous MCA PFR from a ProPFR PFR.

The other villages with higher proportions (over 30%) claiming to have already had a PFR implemented in their village are Kinnikou, Kokabo, Saoré and Wanrarou. In Kinnikou and Bouratébé, 12.5% of the households (7 out of 56) claim that a PFR map was displayed in their village. In the other communes only Matchoré and Toumé had more than 20% of households who claimed to have ever experienced a PFR in their village, each with 21.4%. All of these villages except Wanrarou have been selected to receive a PFR from the ProPFR team, so they may have already been informed and then misunderstood the question that it is about past PFRs.

Table 22 - Ever had a PFR in Bembéréké by commune

	Bérou	Kinnikou	Kokabo	Pédarou	Saoré	Wanrarou	Beroubouay Peulh	Bouratébé	Boro
Ever had PFR	9 16.67%	19 33.93%	21 37.50%	10 17.86%	20 35.71%	20 35.71%	3 5.17%	24 42.86%	5 8.93%
	Guerra- N’Kali	Sissigourou	Dantcha	Ganro	Kpebera	Mani Boke	Timbouré	Konou	Total
Ever had PFR	6 10.71%	5 8.93%	5 8.93%	3 5.36%	1 1.79%	0 0%	7 12.50%	10 17.86%	168 17.67%

On the cluster level, we see that cluster 11 (close to Parakou) in Tchaourou has the most knowledge of the PFR or ADC, with levels lowest across Kalalé. The levels vary in Sinendé, with cluster 5 in the centre showing low levels of awareness of the PFR or ADCs.

Splitting the reason for not participating in the ADC meetings along different characteristics (given that the respondent is aware of it) may also help shed some light on potential discrimination. There are no differences in the reason stated for not attending between migrants and non-migrants, meaning there is no evidence discrimination with regards to not being welcomed. Very few women headed households chose not to attend despite knowing about such a meeting (only 8) meaning that it is difficult to draw conclusions. Women headed households are more likely to state that it was for another reason not listed, with fewer stating they are not welcome than men.

¹⁴ Neither the village chief nor a delegate was interviewed in the other villages with more than 10 respondents claiming to have a PFR. We therefore cannot use this potentially more reliable source of information in these villages.

OPINIONS ABOUT LAND REGISTRATION

In order for households to improve their agricultural productivity due to improved land tenure security, they must also believe that the institutions being used actually lead to an improvement in their security. If a new policy or land certificate is not credible or enforceable, then a household is unlikely to change its behaviour simply due to a piece of paper. If they believe that it does indeed impact situations they may face, such as conflict with another household about who has the right to cultivate the land, then their behaviour, such as investment in soil fertility, may change.

As can be seen below, in Figure 14, respondents believe, on average, that each of the groups named would have more secure rights over land they are using if the land is registered. Those who are most likely to benefit from registering a plot of land are the owners, with herders and migrants least likely to benefit, according to the opinions of the households surveyed. This likely fits with the intended legal impact of land titling which protects the rights of owners, indicating that the household heads on average have a good understanding of the impact of land registration.

Also, for the majority of land tenure related events listed in Figure 15, households feel that they would be better off if they registered a parcel of land. 80% or more of households feel it would be easier to gain compensation if they lost their land, to borrow money, to lend or gift their land to somebody else, to bequeath their land to somebody as inheritance, to rent or sharecrop a plot, and to buy/sell land. However, the proportion of households believing it would become easier to lose land is the same as the proportion believing it would become harder to lose land (i.e. their land is better protected). One hypothesis to be studied further is that some household heads believe their land will be more likely to be expropriated following the registration and mapping of their land. This result contrasts with the other results shown in Figure 15, where the named activities become easier following land registration, and so is worth a little more consideration. The perception that they are more likely to lose land is positively correlated with the fear of reallocation of land and negatively correlated with the fear of losing land to the government. This suggests that households are wary of losing arguments which arise with other households during the process of registering land (e.g. if another family disputes the claim to a plot), rather than fearing expropriation by the government once there is a record of which lands belong to whom.

Figure 14 - Effect on rights of various groups

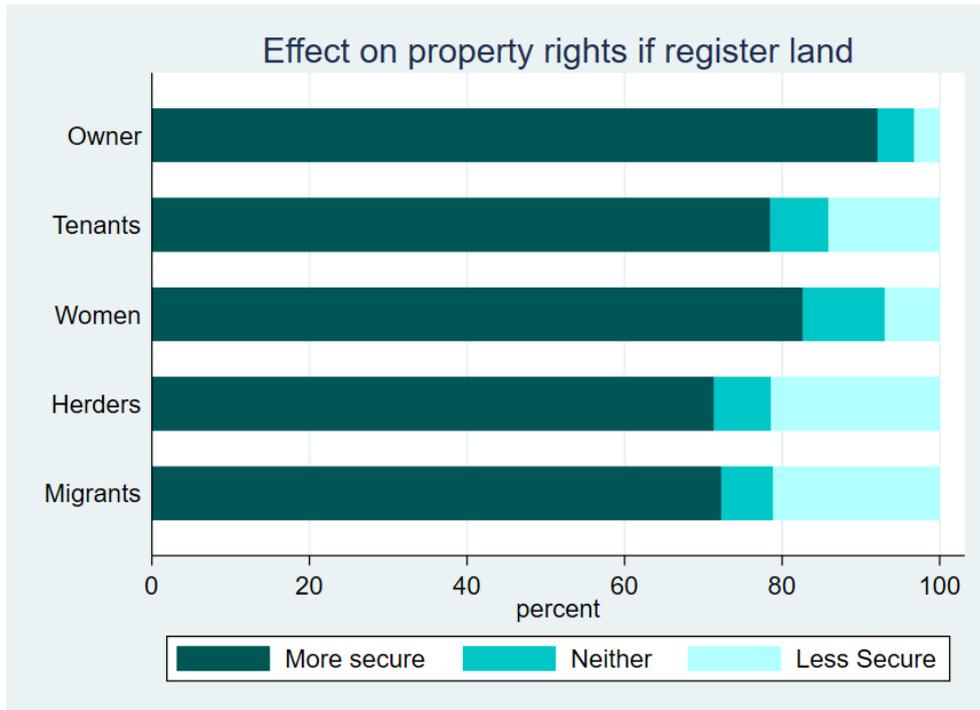
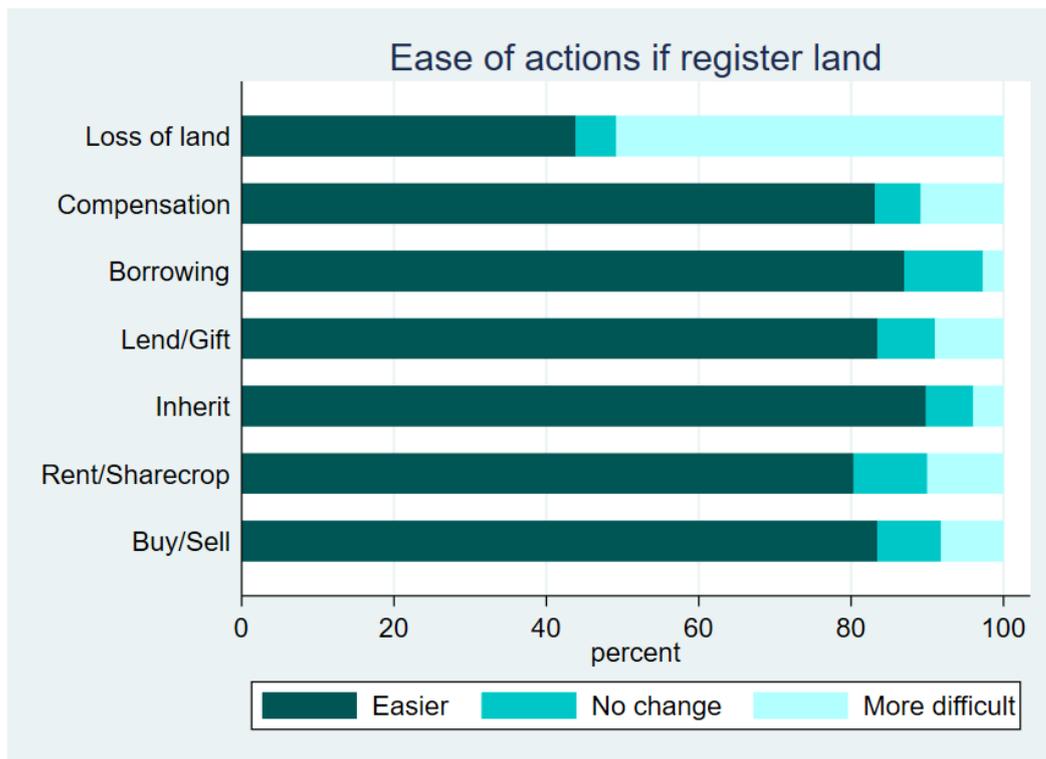


Figure 15 - Effect of registration on ease of land related actions



ACTIVITIES

We now consider variables connected to the activities of the ProPFR intervention, including the demarcation of land as well as the, initially planned, distribution of certificates. Even if no certificates are distributed directly by the programme, households should find it easier to obtain a land title given that their parcel has been delimited and an official survey map exists.

5.3 LAND ACQUISITION, LAND RIGHTS FORMALISATION AND ACCESS TO LAND

LAND ACQUISITION AND TITLES

In Figure 16 for agricultural land, it can be seen that there is quite some variation in the mode of plot acquisition between the clusters. Renting of plots is only present to a significant degree in cluster 1 in Bembéréké. The importance of inheritance vs first occupation of a plot of land varies considerably with the two methods seemingly substitutes, i.e. where there is less inheritance there is more first occupation. The giving of land is fairly stable across clusters, except in cluster 3, where it is smaller, and cluster 11, where giving plays an important role. In general, Kalalé has noticeably more land acquired through inheritance and Bembéréké has more plots as the first occupation. The two clusters in Tchaourou show major differences.

While the clusters, and communes more broadly, differ in the means of acquiring land, the patterns are broadly similar for non-agricultural plots (Figure 17) and agricultural plots (Figure 16). Between the plot types, more are purchased for non-agricultural purposes and more loaned for agricultural purposes. Overall, land markets are still not the dominant mode of plot acquisition. Few agricultural plots are purchased or rented (1.15%) while 94.4% being either inherited, given or are first occupations of the land. The remaining 4.4% are either loaned, sharecropped, obtained by marriage, or fall under the “other” category. The issue of giving land away is dealt with in more depth in the later subsection on “[Land transactions](#)”.

Figure 16 - Mode of plot acquisition for agricultural plots

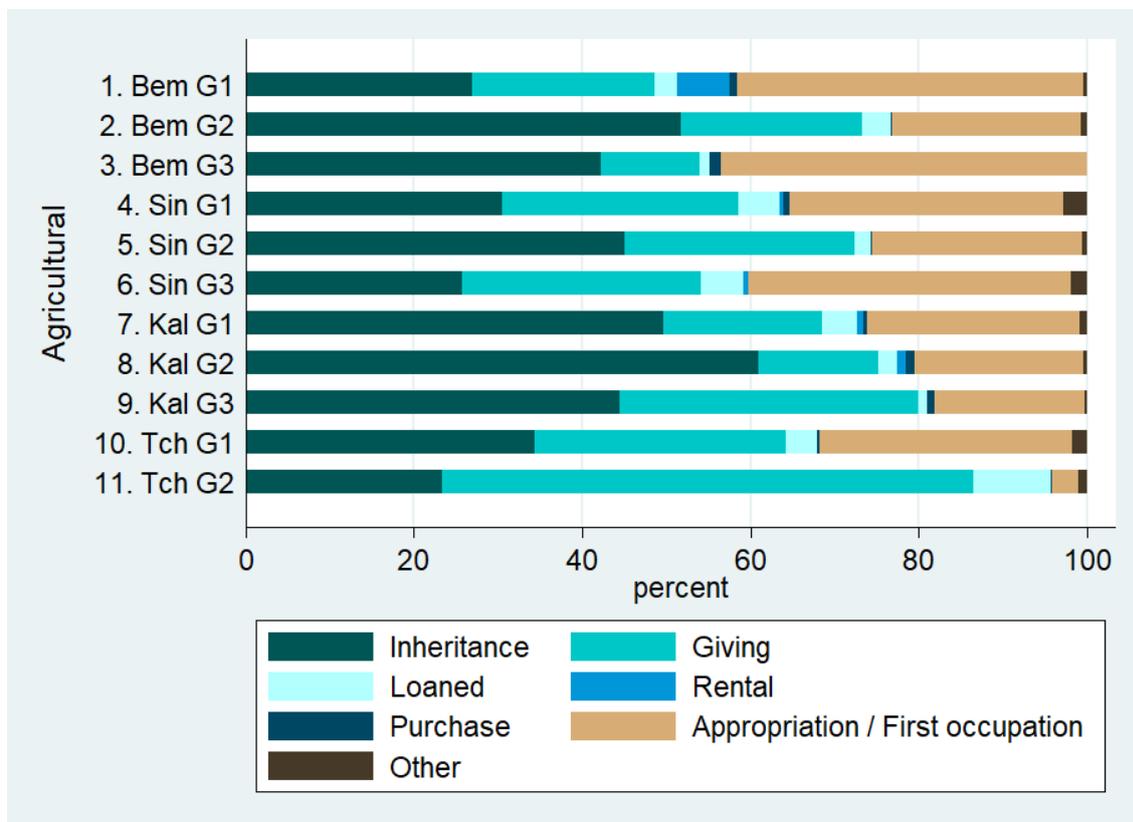
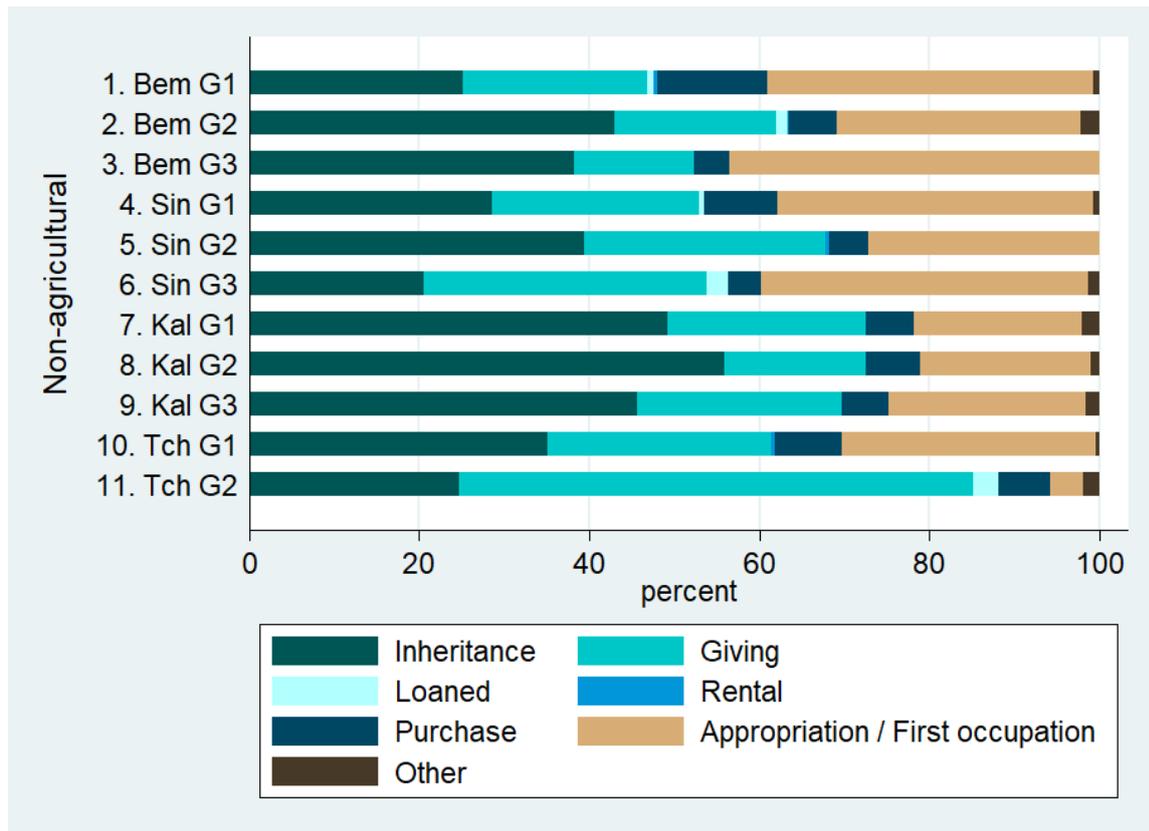


Figure 17 - Mode of plot acquisition for non-agricultural plots



Very few households possess any documentation proving their rights over a plot of land, with slightly more in Bembéréké and Tchaourou for non-agricultural plots. The most common type of document for non-agricultural plots is the convention de vente, though even this is a very low number at 80 plots. Only Bembéréké’s households possess documentation for more than 1% of agricultural plots, with the other communes displaying a negligible level of document ownership. However, most want some documentation for non-agricultural plots and would be willing to pay for it. Households want documentation for 84% of non-agricultural plots and would be willing to pay for 88% of those plots. The amount they are willing to pay for a title to a non-agricultural plot varies widely between communes (from 28,000 to 164,000 FCFA), with the willingness to pay (WTP) lower in Kalalé and Bembéréké.

We are able to shed some light on the question of who has documentation for their agricultural plot. In a regression of document ownership on the wealth index quartile, we find that moving up one quartile is correlated with an increase in the probability of document ownership of 0.4 percentage points, which is an almost 50% increase over the average value of 0.89% of households with documents when accounting for weighting. To summarise: the more well-off households are, the more likely they are to possess some documentation.

For agricultural plots a similar picture emerges. Only 52 plots have documentation for which households claim to have 3 TFs (full title), 5 with a CFR and 1 plot with an ADC. The activities of the ProPFR team to deliver the remaining CFR documents occurred after the baseline survey, so this low number may change by the time the endline survey is run. The majority were listed under other type of document. Further disaggregation on types of documentation by cluster is not feasible due to the small number of plots with documents.

The main reason households claim they do not have documentation is because it is not available, both for agricultural and non-agricultural plots.

Table 23 - Non-Agricultural Plot Documentation

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Non-agri plot has document	66	28	23	43	160
	8.15%	4.80%	5.02%	7.96%	6.69%
Non-Agri: wants documentation	661	460	378	382	1881
	88.84%	82.88%	86.90%	76.86%	84.31%
Non-Agri: willing to pay for document?	571	396	349	340	1656
	86.38%	86.09%	92.33%	89.01%	88.04%
Non-Agri: WTP for document (thousand FCFA)	57.33	28.59	164.83	113.68	83.36
Reason for no title					
Unsolved land conflict	1	1	1	3	6
	0.13%	0.18%	0.23%	0.60%	0.27%
Dangerous plot / Non-constructible	1	0	0	0	1
	0.13%	0.00%	0.00%	0.00%	0.04%
Too expensive	39	8	4	18	69
	5.24%	1.44%	0.92%	3.62%	3.09%
Not ready	29	55	111	161	356
	3.90%	9.91%	25.52%	32.39%	15.96%
Not collected	3	4	3	1	11
	0.40%	0.72%	0.69%	0.20%	0.49%
Not available	299	352	268	174	1093
	40.19%	63.42%	61.61%	35.01%	48.99%
Lost / stolen	0	3	0	0	3
	0.00%	0.54%	0.00%	0.00%	0.13%
Other	372	132	48	140	692
	50.00%	23.78%	11.03%	28.17%	31.02%
Total (with no title)	744	555	435	497	2231

Table 24 – Agricultural Plot Documentation

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Agri plot has document	44 2.25%	4 0.29%	1 0.14%	3 0.20%	52 0.90%
<u>Reason for no title</u>					
Unsolved land conflict	0 0.00%	2 0.15%	2 0.15%	2 0.20%	6 0.11%
Dangerous plot / Non-constructible	2 0.23%	1 0.11%	0 0.00%	1 0.07%	4 0.11%
Too expensive	59 3.01%	11 1.08%	12 1.45%	24 2.60%	106 2.21%
Not ready	82 5.07%	72 7.21%	165 19.30%	207 27.00%	526 14.60%
Not collected	16 0.83%	8 0.64%	5 0.59%	6 0.42%	35 0.63%
Not available	579 42.60%	616 67.00%	475 66.70%	248 30.00%	1918 49.20%
Lost / stolen	168 9.81%	58 5.89%	17 2.53%	74 12.20%	317 8.03%
Lack of information	455 28.40%	71 7.03%	25 4.51%	25 4.78%	576 13.00%
Judged unnecessary	71 4.86%	74 8.61%	11 1.74%	61 7.15%	217 5.30%
Does not own the plot	14 1.02%	2 0.28%	11 1.84%	80 14.30%	107 4.55%
Other	63 4.16%	17 2.06%	9 1.20%	10 1.21%	99 2.33%
Total (with no title)	1509	932	732	738	3911

For the 52 plots which households have documentation for, 31 include the name of a household member, which in all except one case is only the name of the household head. In some cases, other non-household members are also included in the documentation, e.g. there are 6 cases where a different family member from outside the household’s name is on the title (2 cases of the family head and 4 cases of non-descript family member).

While there is no major variation between clusters in a commune in the extent to which households own titles for plots, the reasons for not having documentation varies even within communes. For example, clusters 1 and 2 in Bembéréké view availability as a binding constraint while 2 and 3 see a lack of information as a problem inhibiting them from gaining documentation. Availability is a big issue across Kalalé and Sinendé, though less so in cluster 6 (which in fact is half in Bembéréké).

Title ownership differs a little by gender of the household head. More of the non-agricultural plots of female headed households have a document while the percentage of agricultural plots having a document is slightly lower in female headed households than in male headed ones. There is a noticeable difference in willingness to pay by gender of the household head: female headed households are willing to pay to obtain a document for 80% of their non-agricultural plots while this

is the case for 87% of male headed households. The mode of plot acquisition varies by gender of the head and by type of plot. A greater percentage of non-agricultural plots was inherited in female headed households than in male headed households, while a greater percentage of agricultural plots was gifted, loaned or rented.

Variation in title ownership is greater by migration status, with 15.6% of migrant households' non-agricultural plots having a document against 4.7% in non-migrant households. If migrant households report wanting a document on a lower percentage of non-agricultural plots than non-migrant households, they are willing to pay for such a document for a greater percentage of them (95% against 86% in non-migrant households). Migrant household received almost half of both their non-agricultural and agricultural plots through gifts, followed by purchase for non-agricultural plots (15% of them) and loans for agricultural plots (20% of them).

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Table 25 - Agricultural plot documentation by cluster

	Cluster											Total
	1. Bem	2. Bem	3. Bem	4. Sin	5. Sin	6. Sin	7. Kal	8. Kal	9. Kal	10. Tch	11. Tch	
Agri plot has document	28	8	8	0	1	0	1	3	0	2	1	52
	3.05%	1.76%	2.40%	0%	0.29%	0%	0.29%	0.70%	0%	0.16%	0.26%	0.90%
Reason for no title												
Unsolved land conflict	0	0	0	1	1	0	0	2	0	0	2	6
	0%	0%	0%	0.15%	0.21%	0%	0%	0.55%	0%	0%	0.52%	0.11%
Dangerous plot / Non-	0	2	0	0	0	0	1	0	0	0	1	4
	0%	0.50%	0%	0%	0%	0%	0.30%	0%	0%	0%	0.18%	0.11%
Too expensive	11	7	29	4	7	13	6	5	0	21	3	106
	0.88%	1.44%	8.42%	1.65%	1.41%	6.63%	1.70%	1.82%	0%	3.90%	0.53%	2.21%
Not ready	32	20	33	90	61	11	19	19	34	102	105	526
	6.03%	4.23%	10.30%	34.20	12.70	10.60	5.34%	6.63%	9.33%	27%	27%	14.60%
Not collected	1	4	11	3	2	0	3	5	0	3	3	35
	0.21%	0.77%	3.74%	0.86%	0.68%	0%	0.72%	1.47%	0%	0.31%	0.59%	0.63%
Not available	301	264	46	142	266	35	166	182	268	107	141	1918
	57.80%	46.30%	17.50%	59.10	75.50	28.40	70.30	53.80	72.80	26.40%	35.80%	49.20%
Lost / stolen	111	21	34	0	11	8	16	14	28	51	23	317
	17.10%	3.97%	11.30%	0%	3.44%	3.74%	6.03%	4.70%	6.58%	15.80%	6.52%	8.03%
Lack of information	98	179	117	1	16	69	18	29	24	19	6	576
	11.30%	31.10%	36.20%	0.35%	4.31%	36.60	5.43%	8.85%	7.27%	6.82%	1.57%	13%
Judged unnecessary	18	25	19	0	6	14	23	36	15	7	54	217
	2.17%	5.41%	6.36%	0%	1.27%	8.18%	7.82%	16.40	3.98%	1.92%	15.40%	5.30%
Does not own the plot	6	2	2	7	1	7	0	2	0	33	47	107
	0.98%	0.44%	0.59%	3.06%	0.27%	4.91%	0%	1.05%	0%	17.40%	9.41%	4.55%
Other	21	29	18	1	1	2	7	10	0	1	9	99
	3.45%	5.85%	5.62%	0.58%	0.21%	0.94%	2.36%	4.65%	0%	0.41%	2.48%	2.33%
Total (with no title)	599	553	309	249	372	159	259	304	369	344	394	3911

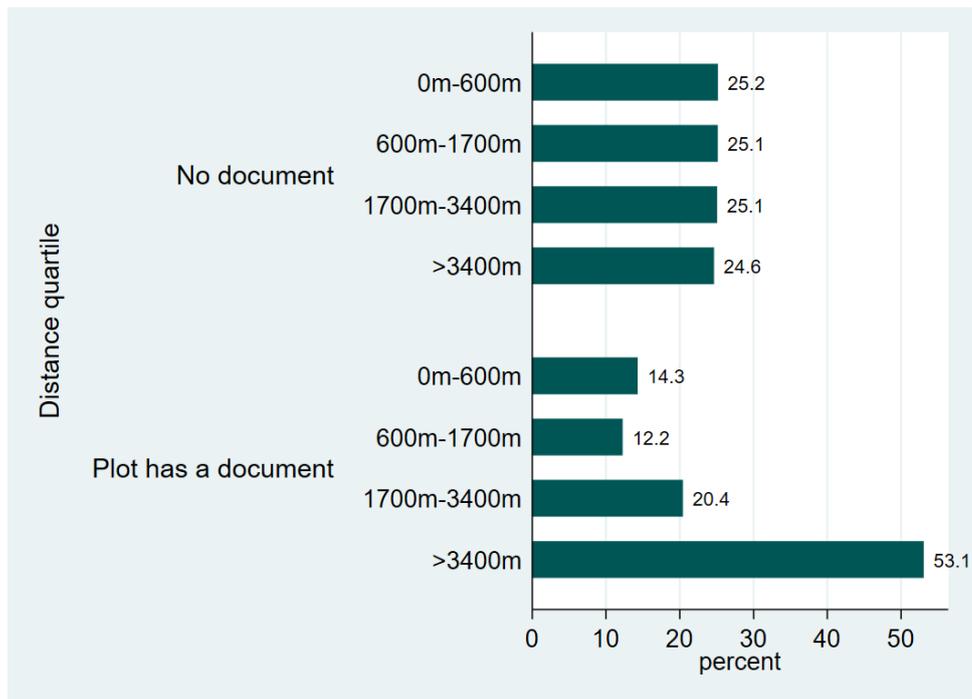
Table 26 - Land title and acquisition by gender of HH head

	HH head gender		Total
	Male	Female	
<u>Non-agricultural plot</u>			
Non-agri plot has document	6.0%	8.8%	6.2%
N	2211	180	2391
Non-Agri: wants documentation	84.2%	83.3%	84.1%
N	2071	160	2231
Non-Agri: willing to pay for document?	87.4%	80.4%	86.9%
N	1746	135	1881
Non-Agri: WTP for doc (thousand FCFA)	79.55	103.5	81.13
<i>Mode of Acquisition</i>			
Inheritance	38.5%	43.4%	38.8%
Gift	29.3%	25.6%	29.0%
Loaned	0.8%	0.3%	0.7%
Rental	0.3%	0.0%	0.3%
Purchase	5.5%	8.6%	5.7%
Appropriation / First occupation	24.9%	16.8%	24.3%
Other	0.9%	5.3%	1.2%
<u>Agricultural plot</u>			
N	3763	200	3963
Agri plot has a document	0.9%	0.5%	0.9%
<i>Mode of Acquisition</i>			
Inheritance	40.1%	38.4%	40.0%
Gift	30.5%	35.3%	30.8%
Loaned	3.5%	6.9%	3.7%
Rental	0.7%	1.9%	0.8%
Purchase	0.4%	0.0%	0.4%
Appropriation / First occupation	24.4%	11.8%	23.7%
Other	0.5%	5.8%	0.8%

Table 27 - Land title and acquisition by migration status

	Migrant Status		Total
	Non Migrant	Migrant	
<u>Non-agricultural plot</u>			
Non-agri plot has document	4.7%	15.6%	6.2%
N	2091	300	2391
Non-Agri: wants documentation	84.5%	81.6%	84.1%
N	1978	253	2231
Non-Agri: willing to pay for document?	85.9%	94.7%	86.9%
N	1677	204	1881
Non-Agri: WTP for doc (thousand FCFA)	83.25	65.59	81.13
<i>Mode of Acquisition</i>			
Inheritance	41.8%	19.8%	38.8%
Gift	26.2%	46.5%	29.0%
Loaned	0.1%	4.4%	0.7%
Rental	0.3%	0.5%	0.3%
Purchase	4.2%	14.9%	5.7%
Appropriation / First occupation	26.2%	12.7%	24.3%
Other	1.2%	1.2%	1.2%
<u>Agricultural plot</u>			
N	3562	401	3963
Agri plot has a document	0.9%	0.5%	0.9%
<i>Mode of Acquisition</i>			
Inheritance	43.5%	12.8%	40.0%
Gift	28.6%	47.6%	30.8%
Loaned	1.5%	20.1%	3.7%
Rental	0.7%	1.5%	0.8%
Purchase	0.4%	0.6%	0.4%
Appropriation / First occupation	24.8%	15.1%	23.7%
Other	0.6%	2.2%	0.8%

Figure 18 - Agricultural plots' title by plot distance



Despite the low number of agricultural plots for which households have a document (52), it is worth noting that the majority of them are located further away from the household residence.

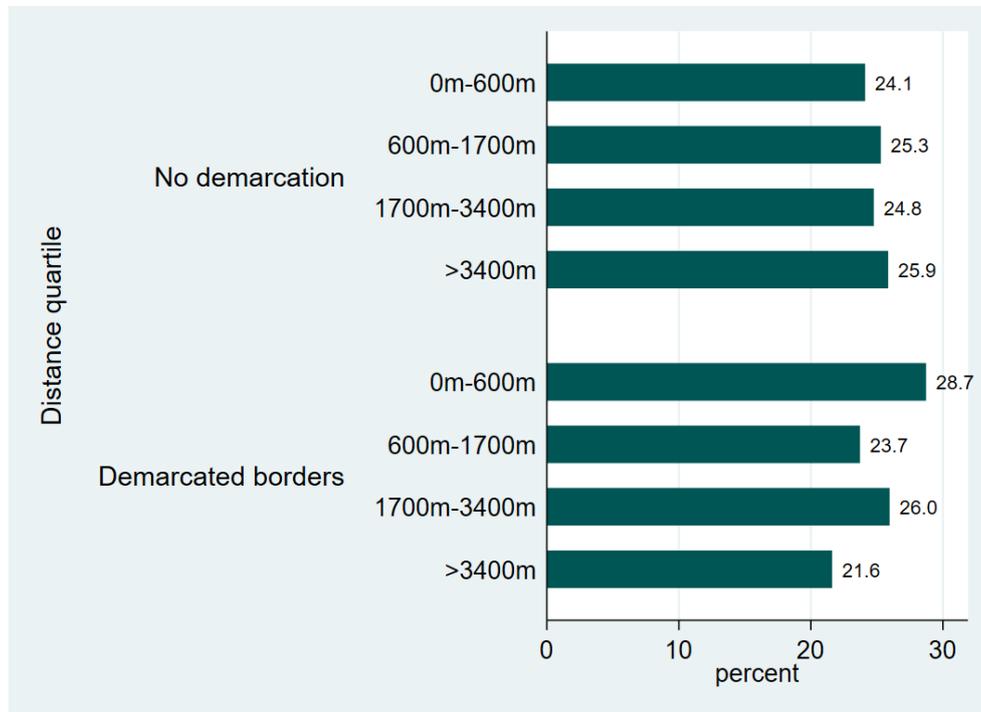
LAND MEASUREMENT AND DEMARCATION

Demarcation can be carried out by households themselves (marking with stones, trees etc.) or as part of a wider intervention, such as a PFR, with the use of official boundary markers. Measurement requires the work of surveyors which is expensive when requested by an individual or household but is often included as part of an intervention.

Very few plots have thus far been measured, with only 120 measured agricultural plots of the 3963 plots in the villages included. This low number means we must be cautious in drawing any conclusions beyond the fact that very few have measured plots. While Bembéréké has more plots measured (45) than the average (30), this is only due to the larger sample in the commune rather than a higher proportion of measured plots. Our sample households claim 10 of these measured plots were due to an existing PFR and 9 of these 10 are in Bouratébé.

The majority of plots also are not demarcated (86% of plots), though those which are demarcated are mostly defined by trees (12% of plots). Demarcated plots tend to be closer to the household residence, as illustrated by Figure 19.

Figure 19 - Demarcation by plot distance



The percentage of plots demarcated is slightly higher among plots managed by women and migrants. Demarcation of land and the measuring of land appear to be largely unrelated. Demarcating the land by marking the boundary does not automatically mean that the land has been measured, meaning that the majority whose borders are marked were not part of any formal process registering land. This is clear in the reason for measuring land, that most state it is a personal decision where the reason is given. Of the measured plots, only 24% are marked with a corner stone or equivalent. While measurement and demarcation are significantly correlated, the small number of plots measured indicates this is not the status quo.

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Table 28 - Plot measurement and demarcation by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Plot boundary marked	18.3%	20.8%	23.6%	13.5%	32.2%	27.3%	11.3%	20.6%	15.5%	12%	34.6%	21%
N	627	561	317	249	373	159	260	307	369	346	395	3963
Plot demarcated	30.8%	68.8%	58.3%	83.5%	80.5%	20.3%	43.1%	55.8%	56%	83.8%	88.8%	65.4%
N	122	112	72	29	107	35	36	60	58	42	136	809
Type of demarcation												
Trees planted	98.6%	91.7%	78.6%	98.7%	100%	91.5%	76.2%	73.8%	80.2%	95.9%	92.6%	93.2%
Corner stones	0%	7.75%	6.55%	0%	0%	8.45%	5.96%	2.04%	0%	4.08%	7.41%	4.05%
Enclosure	0%	0%	14.8%	1.32%	0%	0%	17.8%	24.1%	19.8%	0%	0%	2.58%
Other	1.38%	0.586%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.171%
Plot measured	1.16%	8.66%	1.17%	0%	4.68%	1.01%	0.883%	8.68%	0.977%	2.36%	2%	3.25%
N	627	561	316	249	373	159	260	307	369	346	395	3962
If yes, why?												
PFR	0%	23.6%	0%	.	0%	0%	0%	0%	0%	0%	0%	9.93%
Mayoral census	0%	4.71%	0%	.	15.4%	0%	0%	6.01%	22.2%	34.9%	0%	9.79%
Personal decision	73.3%	37.4%	100%	.	12.3%	100%	33%	22.1%	57.3%	59.8%	36%	37.8%
Other	26.7%	34.2%	0%	.	72.3%	0%	67%	71.8%	20.5%	5.38%	64%	42.4%
Limits marked (if measured)	0%	41.4%	77.3%	.	0%	100%	33%	8.71%	0%	3.31%	32.4%	24.3%

Table 29 - Demarcation by gender of plot manager

	Who decides on the plot		Total
	A man	A woman	
<u>Borders</u>			
None	2997 85.3%	156 82.3%	3153 85.2%
Plant trees	416 13.6%	30 17.0%	446 13.8%
Corner stones	21 0.6%	1 0.5%	22 0.6%
Enclosure	22 0.4%	1 0.2%	23 0.4%
Other	2 0.0%	0 0.0%	2 0.0%

Table 30 - Demarcation by migration status

	Migrant Status		Total
	Non-Migrant	Migrant	
<u>Borders</u>			
None	2825 85.4%	329 83.3%	3154 85.2%
Plant trees	391 13.6%	55 15.6%	446 13.8%
Corner stones	18 0.5%	4 1.0%	22 0.6%
Enclosure	22 0.4%	1 0.1%	23 0.4%
Other	2 0.0%	0 0.0%	2 0.0%

LAND TRANSACTIONS

Reflecting the lack of movement in the land market and little changing in terms of which household uses which land, few households have given away or sold land. Overall 7.5% of households have given land away and less than 1% of households have sold land. The most commonly named reason for giving land away is to start a business (in the table less than “other” which could cover many different reasons), though the sample size is small. Given the variety of reasons that have been mentioned for giving land it is clear that these transactions should not be seen as gifts but only as a change of hands. In a regression of perceived land insecurity on land acquisition, we find that having been given land is correlated with an increase in the probability of perceived land insecurity by 7 percentage points in comparison with having inherited the land. A better understanding of this type of land transaction would shed more light on this result and its possible incidence on land rights formalisation. In practice, land gifts do not transfer all land rights to the person receiving land. Rights over alienation, tree planting and fruit-picking are maintained by the giver. As such, land gifts should be rather seen as long-term loans.¹⁵ We see in Figure 20 that plots given are most often to family members outside the core household, which is more pronounced in Kalalé and Sinendé. Cluster 9 (in Kalalé) and cluster 11 (in Tchaourou) have the highest levels of land being given away.

Table 31 – Land transactions by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Any land given away	3.93%	10.3%	5.01%	10.5%	7.07%
Any land sold	0%	0.115%	0.224%	0.998%	0.365%
Any land lost	3.79%	6.19%	6.39%	2.93%	4.68%
N	963	703	681	692	3039
Reason land gifted					
For funerals	0.0%	0.0%	0.0%	0.8%	0.3%
For a wedding	16.9%	2.0%	15.9%	1.6%	6.7%
To pay a debt	3.3%	0.0%	10.9%	3.0%	3.8%
To start a business	1.6%	9.3%	21.3%	29.0%	18.6%
To buy/build a house	1.6%	4.8%	3.6%	7.9%	5.4%
For consumption goods	7.8%	0.0%	3.6%	2.1%	2.8%
For the family	15.3%	16.1%	30.3%	16.5%	18.7%
Other	53.5%	67.8%	14.5%	39.1%	43.8%

¹⁵ This information can be found in the “Lexique foncier dans le département du Borgou” (2008) prepared by GTZ International Services and Apic-ONG.

Table 32 - Land transactions by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Any land given away	4.84%	5.37%	0.992%	2.82%	6.73%	1.21%	5.23%	10.5%	16.4%	7.69%	15%	7.07%
Any land sold	0%	0%	0%	0%	0.463%	0%	0%	0.416%	0%	1.16%	0.738%	0.365%
Any land lost	4.32%	4.93%	1.97%	7.84%	6.51%	2.43%	3.86%	8.23%	7.31%	1.86%	4.67%	4.68%
N	340	398	228	225	340	113	228	241	234	345	347	3039
Reason land gifted												
For funerals	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.3%
For a wedding	11.0%	16.4%	0.0%	60.2%	11.7%	0.0%	0.0%	0.0%	3.9%	0.0%	2.9%	6.7%
To pay a debt	8.0%	0.0%	0.0%	0.0%	5.9%	100.0%	0.0%	0.0%	0.0%	6.9%	0.0%	3.8%
To start a business	0.0%	23.0%	0.0%	0.0%	12.3%	0.0%	0.0%	9.2%	13.1%	16.3%	38.8%	18.6%
To buy/build a house	0.0%	2.1%	0.0%	0.0%	5.9%	0.0%	13.6%	0.0%	3.9%	2.6%	12.0%	5.4%
For consumption goods	8.0%	6.0%	0.0%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	2.8%
For the family	16.1%	7.4%	100.0%	24.9%	43.8%	0.0%	32.3%	9.6%	13.3%	24.2%	10.6%	18.7%
Other	57.0%	45.1%	0.0%	14.9%	14.6%	0.0%	54.1%	81.2%	65.8%	50.1%	30.5%	43.8%

Land losses have been experienced in around 5% of households. There is no clear pattern in the reason for the loss of a plot though other family members from outside the household appear to play a significant role. We explored the correlation between past land loss and perceived land insecurity. Having experienced land loss is correlated with an increase in the probability of perceived land insecurity of 21 percentage points, with a higher correlation when land has been lost because of the end of contract or agreement, village redistribution, and because it has been taken by public authority. However, due to the low number of observations per reason given for losing land, these results should be taken with caution. Land losses do not differ on average by the gender of the household head (5% among male headed households against 5.4% among female headed households), but is slightly higher among migrant households (6.6% against 4.8% for non-migrants).

Table 33 - Land transactions by gender of the HH head

	HH head gender		Total
	Male	Female	
Any land given away	7.03%	7.4%	7.07%
Any land sold	0.207%	1.71%	0.365%
Any land lost	4.73%	4.26%	4.68%
N	2737	302	3039
<i>Reason for giving land</i>			
For funerals	0.4%	0.0%	0.3%
For a wedding	6.4%	9.6%	6.7%
To pay a debt	4.2%	0.0%	3.8%
To start a business	19.3%	11.9%	18.6%
To buy/build a house	4.7%	11.3%	5.4%
For consumption goods	3.1%	0.0%	2.8%
For the family	19.0%	16.3%	18.7%
Other	42.9%	50.9%	43.8%

Table 34 - Land transactions by migration status

	Migrant status		
	Non-Migrant	Migrant	Total
Any land given away	7.46%	4.75%	7.07%
Any land sold	0.34%	0.512%	0.365%
Any land lost	4.4%	6.27%	4.68%
N	2628	411	3039

<i>Reason for giving land</i>			
For funerals	0.4%	0.0%	0.3%
For a wedding	7.5%	0.0%	6.7%
To pay a debt	2.8%	12.5%	3.8%
To start a business	19.9%	6.4%	18.6%
To buy/build a house	5.6%	3.0%	5.4%
For consumption goods	2.1%	8.7%	2.8%
For the family	16.8%	35.4%	18.7%
Other	44.9%	33.9%	43.8%

Figure 20 - Who are plots given to?

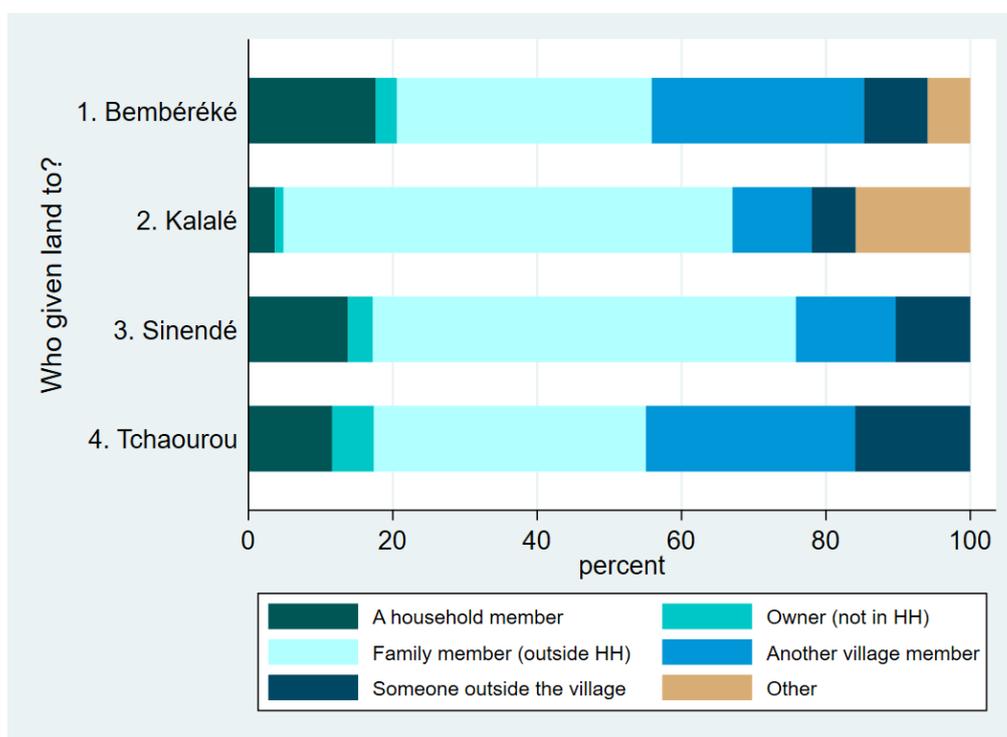
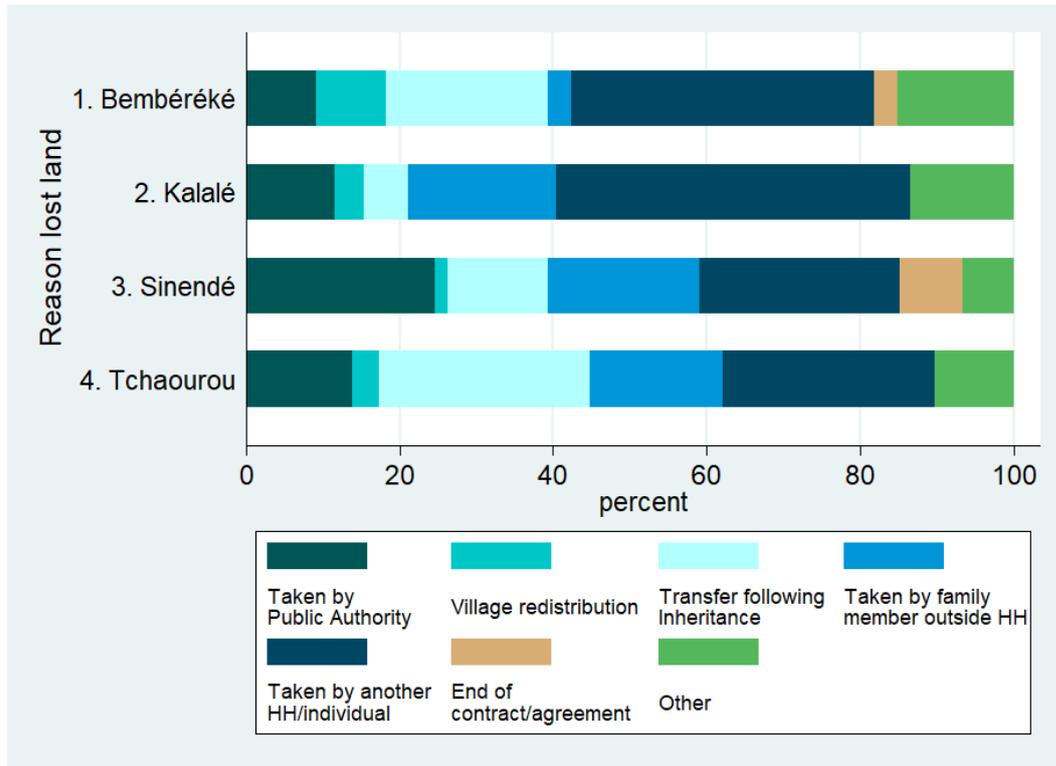
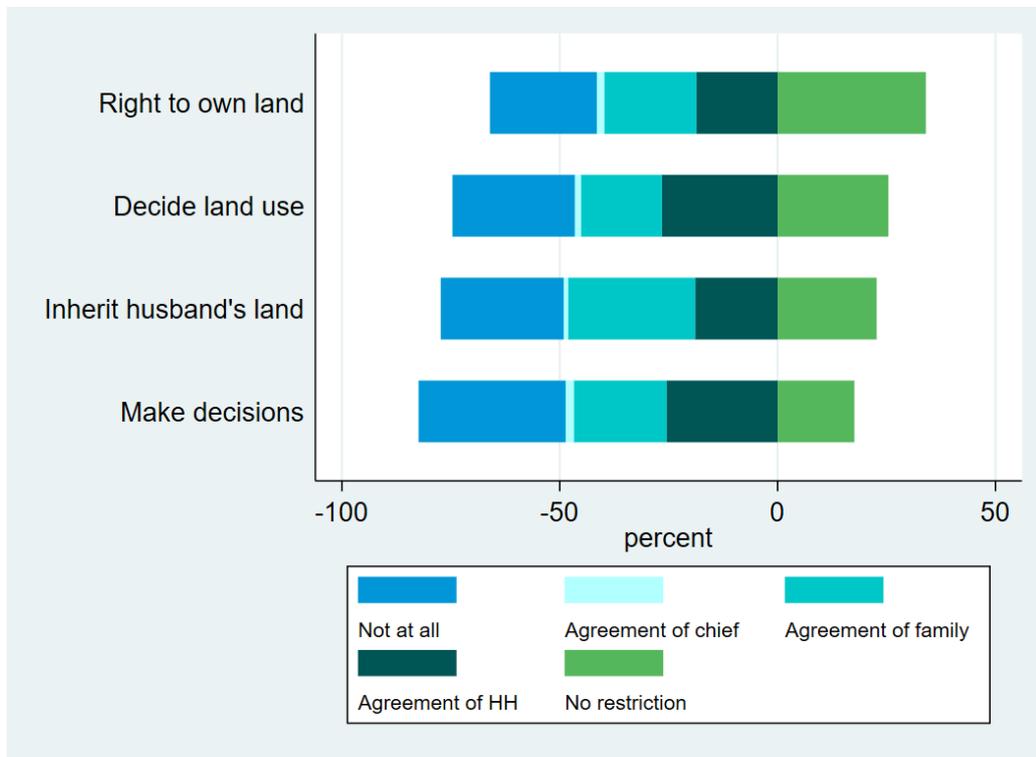


Figure 21 - Reasons for loss of land



WOMEN'S ACCESS TO LAND

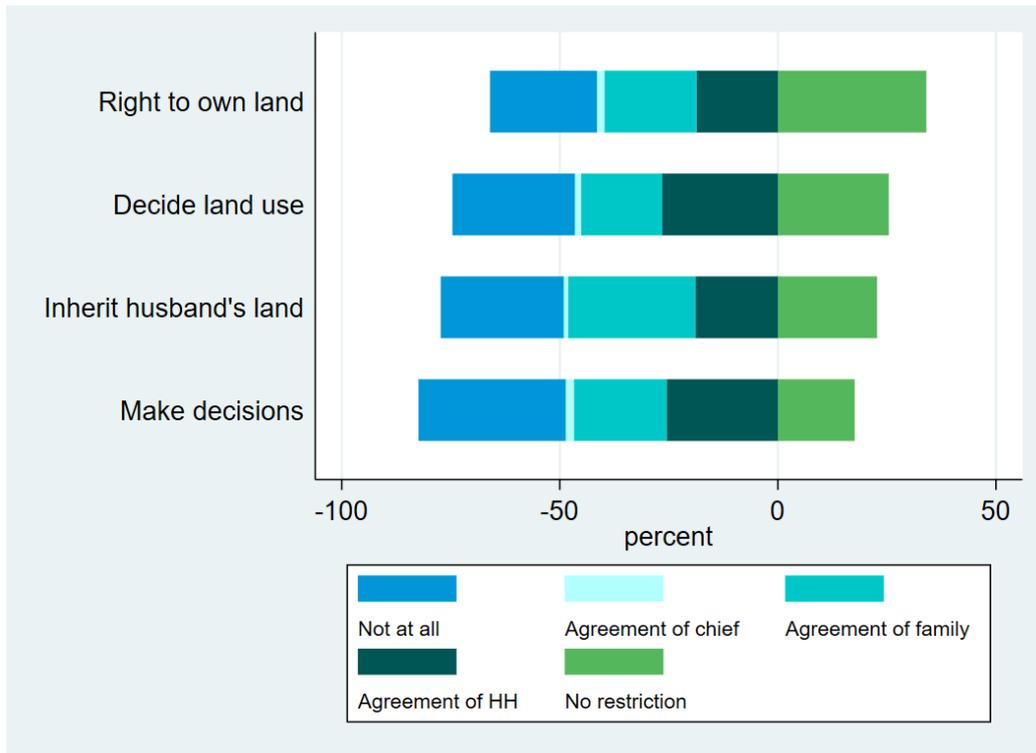
In this section, [Figure 22 - Women's land rights](#)



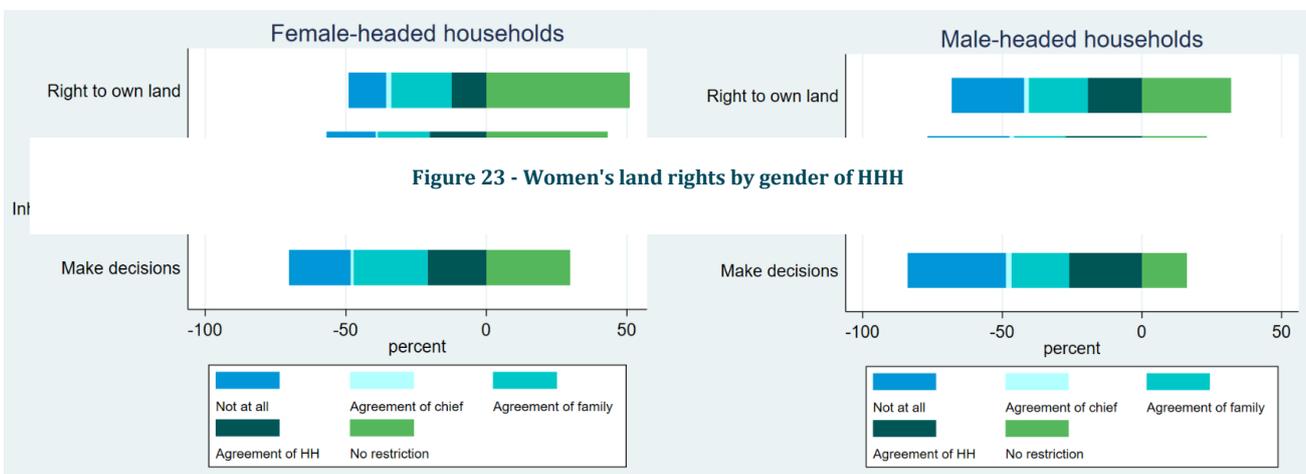
we show the responses of wives of male household heads and female household heads about what rights a woman

has with respect to land.¹⁶ To the right of 0 (in the middle) are the responses for without restriction, while to the left of zero are varying degrees of restrictions to their rights. 24.5% state that a women does not have access to land (to buy or own it) while 34% state they do without restrictions. A similar picture emerges for making decisions about land (its purchases and distribution), decisions about land use and whether a woman can inherit land from her husband. For these 25% or less state women can do these without restriction. Also clear from the graph is that the village chief does not play an important role in deciding what a woman can do with regards to land not reaching even 2% for any of the questions. The activity which a woman has least autonomy in is making decisions about land, such as the purchase, renting of land and land transactions.

Figure 22 - Women's land rights



Opinions on women’s land rights differ between female household heads and women in male-headed households, with higher percentages of female household heads stating that women have rights over



¹⁶ When the household head has several wives, one of them was randomly selected to be interviewed.

access to land and decisions. Fewer female household heads mention the need of agreement from the households but more of them report the need of agreement of the family to make decisions over land transactions.

Distinguishing between communes of residence reveals important disparities in opinions on women’s land rights, opinions being the most favourable in Tchaourou and the least in Sinendé. While the majority of women (53%) in Tchaourou answered that a woman has the right to own land without restriction, this is only the case of 19.7% of them in Sinendé. Looking at opinions by cluster puts forward further heterogeneity within communes, with more restrictions on women’s land rights in Bembéréké G2, Sinendé G2, Sinendé G1 and Kalalé G3. These differences should be taken into account in considering the availability of the ProPFR interventions to reach women in these clusters. Opinions also vary by level of household wealth, women in wealthier households expressing more favourable opinions on women’s land rights.

Table 35 - Opinions about women's land rights by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<u>Right to own land</u>					
No restriction	27.5%	38.5%	19.7%	53.0%	33.7%
With agreement	39.3%	38.1%	44.9%	42.4%	41.6%
Cannot	33.1%	23.5%	35.4%	4.6%	24.7%
N	864	613	601	568	2646
<u>Decide land use</u>					
No restriction	22.8%	23.1%	20.0%	36.9%	25.8%
With agreement	41.6%	47.5%	43.4%	53.5%	46.2%
Cannot	35.6%	29.4%	36.6%	9.6%	28.0%
N	864	613	601	568	2646
<u>Inherit husband's land</u>					
No restriction	20.2%	19.2%	10.6%	35.7%	21.3%
With agreement	46.2%	40.7%	54.1%	53.0%	49.5%
Cannot	33.6%	40.1%	35.3%	11.3%	29.2%
N	864	613	601	568	2646
<u>Make decisions</u>					
No restriction	16.1%	19.5%	10.9%	25.5%	17.6%
With agreement	44.7%	45.9%	41.5%	61.5%	48.4%
Cannot	39.1%	34.6%	47.6%	13.0%	34.0%
N	864	613	601	568	2646

Table 36 - Opinions about women's land rights by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Right to own land</u>												
No restriction	35.9%	17.8%	41.6%	21.6%	12.1%	36.1%	40.5%	39.3%	35.1%	57.0%	46.5%	33.7%
With agreement	39.9%	37.2%	44.3%	44.5%	43.5%	49.7%	34.3%	48.6%	34.3%	40.3%	45.6%	41.6%
Cannot	24.2%	45.0%	14.2%	33.8%	44.4%	14.1%	25.2%	12.0%	30.6%	2.6%	7.8%	24.7%
N	303	357	207	200	302	96	210	199	204	279	289	2646
<u>Decide land use</u>												
No restriction	30.2%	14.3%	34.8%	16.2%	12.6%	42.3%	24.1%	22.6%	22.4%	38.3%	34.8%	25.8%
With agreement	45.6%	35.7%	50.8%	48.7%	43.6%	39.9%	47.7%	53.6%	42.2%	57.9%	46.5%	46.2%
Cannot	24.2%	50.0%	14.5%	35.1%	43.8%	17.8%	28.3%	23.7%	35.5%	3.9%	18.7%	28.0%
N	303	357	207	200	302	96	210	199	204	279	289	2646
<u>Inherit husband's land</u>												
No restriction	26.0%	7.3%	29.5%	10.2%	8.3%	31.2%	18.2%	23.8%	16.7%	34.1%	38.3%	21.3%
With agreement	53.4%	45.3%	50.8%	62.4%	46.1%	51.6%	41.8%	45.1%	35.7%	53.4%	52.3%	49.5%
Cannot	20.6%	47.4%	19.6%	27.4%	45.6%	17.2%	40.0%	31.1%	47.6%	12.5%	9.3%	29.2%
N	303	357	207	200	302	96	210	199	204	279	289	2646
<u>Make decisions</u>												
No restriction	25.3%	9.6%	20.8%	8.4%	6.7%	21.9%	22.9%	16.5%	17.6%	27.9%	21.5%	17.6%
With agreement	46.6%	36.5%	59.4%	45.9%	40.1%	47.4%	45.4%	54.1%	39.8%	66.0%	54.2%	48.4%
Cannot	28.1%	53.9%	19.8%	45.7%	53.2%	30.7%	31.6%	29.4%	42.7%	6.1%	24.3%	34.0%
N	303	357	207	200	302	96	210	199	204	279	289	2646

Table 37 - Opinions about women's land rights by wealth quartile

	Wealth quintile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
<u>Right to own land</u>					
No restriction	21.9%	33.8%	33.3%	44.1%	33.2%
With agreement	44.0%	45.8%	44.0%	40.2%	43.5%
Cannot	34.2%	20.4%	22.8%	15.7%	23.3%
N	466	472	484	485	1907
<u>Decide land use</u>					
No restriction	15.9%	25.6%	26.6%	33.0%	25.3%
With agreement	45.1%	49.7%	47.8%	46.2%	47.2%
Cannot	39.0%	24.7%	25.6%	20.8%	27.5%
N	466	472	484	485	1907
<u>Inherit husband's land</u>					
No restriction	18.5%	17.1%	22.9%	26.1%	21.1%
With agreement	42.3%	48.7%	52.5%	55.3%	49.7%
Cannot	39.2%	34.2%	24.5%	18.6%	29.2%
N	466	472	484	485	1907
<u>Make decisions</u>					
No restriction	11.4%	16.9%	16.8%	21.6%	16.7%
With agreement	44.7%	51.1%	52.6%	51.5%	50.0%
Cannot	43.9%	31.9%	30.6%	26.9%	33.4%
N	466	472	484	485	1907

Considering the empowerment of women, one major issue is what happens to them in the event of divorce/separation or if a woman is widowed. Only 11% of women would be allowed to keep any land if they experienced a separation from their husband, with the modal response of those keeping some land being “less than half” of the land. Roughly 2.4% of the women interviewed have indeed experienced a loss of land following a separation (which is 16% of those who experienced a separation), with differences across communes. In Sinendé nearly 30% of separated women have experienced a loss of land, while this is the case of 5% of separated women in Tchaourou. While the results are not as strong as in the case of separation, a majority of women (57.3%) would receive no land in the result that they become widowed, this percentage being higher in Kalalé. In line with results on opinions on women’s land rights, widows’ access to their deceased husband’s land is more restricted in Kalalé G3 and Bembéréké G2 and access improves with household wealth.

Table 38 - Women's land rights post life events by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<u>Prop land kept after separation</u>					
All	2,7%	1,2%	1,2%	3,2%	2,1%
More than half	0,8%	0,7%	3,0%	0,9%	1,5%
Half	3,2%	2,1%	2,1%	7,6%	3,8%
Less than half	2,4%	3,2%	4,2%	5,8%	3,9%
None	91,0%	92,7%	89,5%	82,5%	88,7%
N	822	566	554	484	2426
<u>Lost land because of separation/divorce</u>					
Lost land because of separation/divorce	20,1%	8,0%	29,7%	5,3%	15,9%
N	81	88	94	116	379
<u>Prop land kept if husband dies</u>					
All	4,6%	9,0%	4,6%	15,0%	7,9%
More than half	1,1%	1,8%	3,2%	1,5%	1,9%
Half	9,1%	6,1%	6,3%	18,3%	10,1%
Less than half	24,6%	16,8%	27,0%	19,4%	22,7%
None	60,7%	66,4%	58,8%	45,8%	57,3%
N	822	566	554	484	2426

Table 39 - Women's land rights post life events by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Prop land kept after separation</u>												
All	1,8%	1,0%	5,0%	0,0%	0,3%	8,0%	0,9%	2,4%	0,7%	3,9%	2,3%	2,1%
More than half	1,9%	0,0%	1,0%	0,0%	1,6%	9,2%	0,7%	1,8%	0,0%	1,3%	0,3%	1,5%
Half	2,2%	2,7%	5,3%	2,2%	1,5%	4,5%	2,1%	3,3%	1,3%	8,9%	5,4%	3,8%
Less than half	0,7%	3,0%	5,9%	9,1%	1,6%	3,1%	2,6%	5,6%	2,2%	3,9%	8,8%	3,9%
None	93,4%	93,3%	82,9%	88,6%	95,0%	75,2%	93,7%	86,8%	95,8%	82,0%	83,2%	88,7%
N	284	342	197	184	279	90	193	174	199	231	253	2426
Lost land because of separation/divorce	14,3%	26,7%	24,6%	31,4%	18,1%	45,1%	7,4%	6,9%	10,1%	3,1%	10,2%	15,9%
N	43	28	13	31	44	16	25	36	27	62	54	379
<u>Prop land kept if husband dies</u>												
All	3,9%	3,3%	6,8%	3,9%	4,0%	9,7%	12,9%	10,5%	3,1%	12,3%	19,3%	7,9%
More than half	1,7%	1,3%	0,9%	0,8%	1,7%	7,7%	1,6%	3,6%	0,5%	2,0%	0,6%	1,9%
Half	14,1%	5,6%	9,6%	2,6%	6,7%	10,4%	6,7%	10,7%	1,8%	22,1%	12,3%	10,1%
Less than half	37,5%	18,1%	30,0%	32,5%	22,9%	23,5%	13,4%	23,9%	15,6%	18,9%	20,0%	22,7%
None	42,8%	71,8%	52,8%	60,1%	64,7%	48,8%	65,4%	51,2%	79,0%	44,6%	47,7%	57,3%
N	284	342	197	184	279	90	193	174	199	231	253	2426

Table 40 - Women's land rights post life events by wealth quartile

	Wealth quartile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
<u>Prop land kept after separation</u>					
All	1,7%	1,9%	2,3%	2,2%	2,0%
More than half	0,2%	0,5%	1,8%	2,9%	1,4%
Half	2,4%	3,8%	6,2%	4,0%	4,1%
Less than half	2,7%	4,0%	4,9%	5,6%	4,3%
None	92,9%	89,8%	84,8%	85,2%	88,2%
N	433	442	434	469	1778
Lost land because of separation/divorce					
	16,0%	22,6%	15,4%	10,9%	15,6%
N	49	59	77	74	259
<u>Prop land kept if husband dies</u>					
All	9,0%	5,9%	10,6%	9,2%	8,6%
More than half	0,8%	2,5%	1,9%	2,3%	1,9%
Half	6,6%	10,5%	12,1%	12,4%	10,4%
Less than half	14,8%	23,3%	25,0%	31,9%	23,9%
None	68,8%	57,8%	50,5%	44,2%	55,2%
N	433	442	434	469	1778

Another aspect of access to land is the plots a woman works on. Only 8% of women take decision over a plot, this percentage differing significantly according to the gender of the household head. While half of female household heads are taking decision over a plot, this is the case of only 2.5% of women in male-headed households. This contributes to observed differences by commune, with less than 4% of women managing a plot in Kalalé and around 10% in Sinendé and Tchaourou. These figures contrast with women's labour inputs, 39% of them working on a plot and a lower difference between male and female headed households (38% and 47% respectively). Among women working on a plot, 40% of women claim it is their own decision which plot they work on. In contrast with women's involvement in plot management, this percentage is lower in Tchaourou.

The length of time an arrangement regarding which plot they work on varies substantially among women, in that the responses are spread among the choices possible in our survey. Although 31% of women only have certainty about the plot they will work on for this season, 29% claim they can stay on the plot for an indefinite period and 17% say they can work the plot for their whole life. It seems women in Kalalé and Sinendé are more prone to be moved from plot to plot each season.

The women interviewed have not benefited much and do not expect to benefit from inheriting land. Only 4.3% and 6.7% of women have already inherited non-agricultural land and agricultural land respectively. The figures are slightly higher when asked whether they expect to inherit land but are broadly similar in terms of the pattern in the data. It is noticeable that women in Tchaourou have inherited more and expect to inherit more.

Most women claim that if they had enough money, their husband would allow them to purchase land, with 70% responding in this manner. Again, the number is higher in Tchaourou than elsewhere. If a

woman is allowed to purchase land, roughly 90% state that the land could be registered in their own name.

Distinguishing between wives and female household heads puts forward greater decision-making over plots to work on (77% of female heads against 33% of wives) and greater access to land. Noticeable differences are higher percentages of female heads that already inherited land from their parents: 17.6% of them received non-agricultural land and 20.3% of them agricultural land.

Table 41 - Women's land rights by commune, working land

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Take decision over a plot	6.6%	3.6%	9.8%	10.3%	8.1%
N	872	619	617	570	2678
Work on a plot	42.0%	38.7%	36.2%	40.6%	39.4%
N	864	613	601	568	2646
If yes, own decision which plot to work on	36.3%	48.6%	48.9%	27.6%	39.3%
N	374	217	227	206	1024
How long continue working on the current plot					
Seasonal	25.1%	47.3%	28.8%	15.9%	27.0%
Annual	6.4%	16.5%	9.0%	3.1%	7.8%
Several years	18.5%	2.6%	13.4%	15.8%	13.9%
All her life	19.0%	9.7%	26.6%	16.3%	18.9%
Indefinite period	31.1%	23.5%	21.9%	49.0%	32.3%
N	374	217	227	206	1024
Inherited / given non-agri land from parents	2.2%	2.8%	3.7%	8.0%	4.3%
N	864	613	601	568	2646
Inherited / given agri land from parents	5.3%	2.5%	6.3%	11.0%	6.7%
N	864	613	601	568	2646
Expect to inherit non-agri land from parents	4.6%	3.1%	7.7%	14.3%	7.8%
N	843	593	580	527	2543
Expect to inherit agri land from parents	6.3%	2.2%	8.8%	21.3%	10.2%
N	821	599	566	517	2503
Husband allow wife to buy land	54.7%	65.1%	71.2%	85.2%	69.4%
N	864	613	601	568	2646
If buy land, in woman's name?	90.0%	77.3%	91.7%	92.5%	89.5%
N	503	411	435	460	1809

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Table 42 - Women's land rights by cluster, working land

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Take decision over a plot	6.2%	6.0%	7.7%	13.0%	6.4%	14.7%	2.7%	6.5%	2.5%	11.5%	8.4%	8.1%
N	304	363	208	209	309	96	211	203	205	281	289	2678
Work on a plot	43.2%	39.9%	46.4%	37.6%	32.0%	43.8%	42.7%	38.2%	33.7%	36.2%	47.8%	39.4%
N	303	357	207	200	302	96	210	199	204	279	289	2646
If yes, own decision which plot to work on	37.6%	27.9%	47.5%	59.2%	41.5%	59.1%	57.2%	49.8%	33.2%	29.5%	25.3%	39.3%
N	136	142	96	76	106	45	79	68	70	78	128	1024
<u>How long continue working on the current plot</u>												
Seasonal	32.2%	11.8%	36.7%	36.1%	29.3%	31.8%	65.9%	40.8%	22.5%	1.8%	33.1%	27.0%
Annual	11.0%	4.7%	1.0%	20.2%	5.6%	3.3%	14.5%	23.2%	13.7%	4.8%	1.1%	7.8%
Several years	13.7%	15.2%	13.5%	7.5%	16.6%	29.8%	2.6%	4.0%	1.1%	13.6%	18.4%	13.9%
All her life	25.8%	24.3%	17.3%	15.1%	22.5%	25.5%	4.5%	9.4%	18.8%	22.4%	8.9%	18.9%
Indefinite period	17.3%	44.0%	31.6%	21.1%	25.5%	9.6%	12.5%	21.3%	43.9%	57.5%	38.5%	32.3%
N	136	142	96	76	106	45	79	68	70	78	128	1024
Inherited / given non-agri land from parents	2.3%	2.4%	3.0%	0.4%	4.2%	5.6%	2.3%	5.5%	1.0%	8.2%	7.7%	4.3%
N	303	357	207	200	302	96	210	199	204	279	289	2646
Inherited / given agri land from parents	5.2%	5.7%	6.4%	5.0%	4.4%	10.6%	2.6%	4.3%	0.9%	11.6%	9.9%	6.7%
N	303	357	207	200	302	96	210	199	204	279	289	2646
Expect to inherit non-agri land from parents	4.4%	7.0%	2.9%	2.6%	10.8%	2.9%	2.6%	2.8%	4.0%	10.1%	21.1%	7.8%
N	294	350	201	198	289	91	203	188	202	261	266	2543
Expect to inherit agri land from parents	6.3%	7.9%	4.8%	5.2%	9.5%	8.5%	0.3%	4.9%	2.5%	20.2%	23.1%	10.2%
N	287	340	195	190	288	87	205	192	202	255	262	2503
Husband allow wife to buy land	53.6%	53.8%	70.2%	77.1%	67.8%	68.1%	64.4%	64.7%	66.5%	80.4%	92.8%	69.4%
N	303	357	207	200	302	96	210	199	204	279	289	2646
If buy land, in woman's name?	94.1%	93.8%	81.7%	86.7%	95.6%	83.8%	76.2%	80.1%	76.3%	88.6%	98.0%	89.5%
N	177	187	146	156	202	70	131	140	140	195	265	1809

Table 43 - Women's land rights by gender of HH, working land

	HH head gender		
	Male	Female	Total
Make decision on a plot	2.5%	50.2%	8.1%
N	2383	295	2678
Work on a plot	38.3%	47.3%	39.4%
N	2354	292	2646
If yes, own decision which plot to work on	33.1%	77.3%	39.3%
N	896	128	1024
How long continue working on the current plot			
Seasonal	29.1%	14.0%	27.0%
Annual	8.4%	3.7%	7.8%
Several years	14.2%	11.8%	13.9%
All her life	15.7%	38.9%	18.9%
Indefinite period	32.4%	31.3%	32.3%
N	896	128	1024
Inherited / given non-agri land from parents	2.5%	17.6%	4.3%
N	2354	292	2646
Inherited / given agri land from parents	4.9%	20.3%	6.7%
N	2354	292	2646
Expect to inherit non-agri land from parents	7.6%	9.0%	7.8%
N	2304	239	2543
Expect to inherit agri land from parents	10.2%	9.6%	10.2%
N	2263	240	2503
Husband allow wife to buy land	68.1%	79.1%	69.4%
N	2354	292	2646
If buy land, in woman's name?	88.7%	94.7%	89.5%
(N and % of those who can buy land)	1586	223	1809

YOUNG MEN'S ACCESS TO LAND

Young men are also considered as an at-risk group in lacking access to land, with the potential consequence of lower productivity. We interviewed men aged 18-35 in a separate module from the household head. In most cases the majority state that there are no restrictions to a young man being able to have access to purchase land, decide on a plot's use, to inherit land from their father or their mother. Decisions on land such as buying, selling and renting, however, are more restricted. Nearly half state that a young man requires agreement from the household, family or village chief and some others say a young man could not make such decisions. Opinions on young men's land rights differ across communes, notably for decisions on land and land use. 13% of young men state that a young man cannot make decisions on land in Tchaourou against 27% and 26% in Sinendé and Bembéréké. Looking at opinions by cluster, there are few differences within Sinendé and Kalalé while Bembéréké G2 and Tchaourou G2 stand out for greater restrictions on young men's land rights.

Opinions on young men's land rights appear more restricted with household wealth. A smaller percentage of young men from richer households state that a young man has right to own land, decides on land use and inherits land without restriction and a greater percentage of them report that a young man cannot make decisions on land.

Figure 24 - Young men's land rights

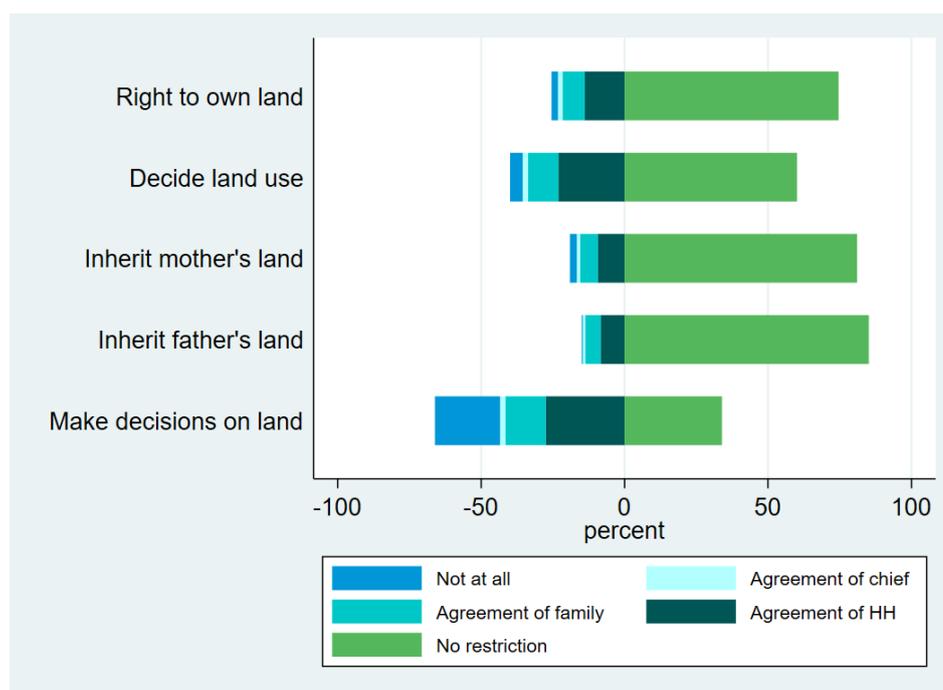


Table 44 - Opinions about young men's land rights by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<u>Right to own land</u>					
No restriction	74.2%	86.2%	60.1%	87.2%	74.7%
With agreement	22.7%	12.1%	36.5%	12.4%	22.9%
Cannot	3.2%	1.7%	3.4%	0.4%	2.4%
N	282	139	144	119	684
<u>Decide land use</u>					
No restriction	57.7%	61.6%	55.2%	72.6%	61.0%
With agreement	37.9%	32.3%	41.7%	24.6%	35.2%
Cannot	4.4%	6.1%	3.1%	2.8%	3.9%
N	282	139	144	119	684
<u>Inherit mother's land</u>					
No restriction	83.2%	89.7%	74.1%	83.5%	81.5%
With agreement	15.0%	9.1%	23.3%	13.4%	16.3%
Cannot	1.8%	1.3%	2.7%	3.0%	2.3%
N	282	139	144	119	684
<u>Inherit father's land</u>					
No restriction	86.2%	93.7%	75.8%	92.3%	85.6%
With agreement	13.6%	6.3%	23.6%	7.7%	14.2%
Cannot	0.2%	0.0%	0.6%	0.0%	0.3%
N	282	139	144	119	684
<u>Make decisions on land</u>					
No restriction	34.5%	39.8%	22.7%	49.4%	35.2%
With agreement	39.3%	40.6%	50.3%	37.6%	42.3%
Cannot	26.2%	19.6%	27.0%	13.0%	22.5%
N	282	139	144	119	684

Table 45 - Opinions about young men's land rights by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Right to own land</u>												
No restriction	66.0%	79.4%	69.2%	82.7%	47.3%	64.2%	98.4%	66.8%	87.4%	93.2%	77.5%	74.7%
With agreement	28.4%	19.5%	29.5%	17.3%	48.2%	29.5%	1.6%	29.1%	10.8%	6.8%	21.5%	22.9%
Cannot	5.5%	1.1%	1.3%	0.0%	4.5%	6.3%	0.0%	4.1%	1.7%	0.0%	1.0%	2.4%
N	105	100	70	50	67	34	34	43	62	52	67	684
<u>Decide land use</u>												
No restriction	58.3%	62.2%	43.3%	68.6%	42.4%	60.3%	72.9%	54.7%	56.6%	81.5%	58.0%	61.0%
With agreement	40.4%	32.0%	52.0%	30.7%	51.2%	37.7%	25.5%	39.4%	33.7%	18.5%	34.6%	35.2%
Cannot	1.3%	5.8%	4.7%	0.7%	6.4%	2.0%	1.6%	5.9%	9.7%	0.0%	7.4%	3.9%
N	105	100	70	50	67	34	34	43	62	52	67	684
<u>Inherit mother's land</u>												
No restriction	78.8%	83.1%	78.6%	83.7%	61.5%	93.7%	98.4%	80.0%	88.2%	85.0%	81.2%	81.5%
With agreement	19.1%	14.7%	21.4%	14.9%	34.9%	4.3%	0.0%	20.0%	10.1%	12.5%	14.9%	16.3%
Cannot	2.1%	2.2%	0.0%	1.4%	3.6%	2.0%	1.6%	0.0%	1.7%	2.5%	3.9%	2.3%
N	105	100	70	50	67	34	34	43	62	52	67	684
<u>Inherit father's land</u>												
No restriction	80.9%	87.5%	79.5%	87.1%	64.6%	91.4%	98.4%	87.4%	93.4%	93.0%	91.1%	85.6%
With agreement	18.4%	12.5%	20.5%	12.9%	34.0%	8.6%	1.6%	12.6%	6.6%	7.0%	8.9%	14.2%
Cannot	0.7%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
N	105	100	70	50	67	34	34	43	62	52	67	684
<u>Make decisions on land</u>												
No restriction	41.3%	29.0%	25.7%	19.0%	25.3%	28.8%	45.2%	34.3%	38.7%	57.6%	35.8%	35.2%
With agreement	39.1%	36.7%	52.9%	54.3%	50.0%	44.4%	34.9%	44.1%	43.1%	36.0%	40.1%	42.3%
Cannot	19.6%	34.3%	21.3%	26.7%	24.6%	26.8%	19.9%	21.6%	18.3%	6.4%	24.1%	22.5%
N	105	100	70	50	67	34	34	43	62	52	67	684

Table 46 - Opinions about young men's land rights by wealth quartile

	Wealth quintile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
<u>Right to own land</u>					
No restriction	82.4%	77.1%	74.6%	68.3%	74.7%
With agreement	17.6%	21.7%	22.8%	27.5%	23.0%
Cannot	0.0%	1.2%	2.6%	4.2%	2.2%
N	86	148	126	157	517
<u>Decide land use</u>					
No restriction	61.6%	62.1%	56.2%	55.6%	58.7%
With agreement	36.4%	33.8%	40.7%	38.3%	37.2%
Cannot	1.9%	4.1%	3.1%	6.1%	4.1%
N	86	148	126	157	517
<u>Inherit mother's land</u>					
No restriction	87.8%	87.8%	79.7%	76.0%	82.3%
With agreement	10.1%	10.1%	18.5%	23.4%	16.1%
Cannot	2.1%	2.1%	1.9%	0.6%	1.6%
N	86	148	126	157	517
<u>Inherit father's land</u>					
No restriction	93.3%	88.6%	82.2%	80.7%	85.5%
With agreement	6.7%	11.4%	16.7%	18.9%	14.1%
Cannot	0.0%	0.0%	1.1%	0.3%	0.4%
N	86	148	126	157	517
<u>Make decisions on land</u>					
No restriction	34.2%	33.0%	27.2%	37.8%	33.3%
With agreement	45.2%	40.3%	50.6%	34.8%	41.8%
Cannot	20.6%	26.6%	22.2%	27.4%	24.8%
N	86	148	126	157	517

40.2% of 18-35 year olds surveyed have a plot under their management, while only 8.8% can make decisions over a plot. This figure is higher in Tchaourou, though fewer young men have a plot under their management in this commune. Those with a plot to call their own are more likely to state they can remain there indefinitely. In Bembéréké where the highest proportion have a plot to manage the young men are simultaneously most likely to receive that plot only for a season. Typically, another household member decides which plot is used by young men and this is likely to be the household head living within the household. 42% of young men who are not the household head may choose which plot they manage. If young men are given a plot to manage, they are usually allowed to use the household's equipment to work the plot (75% on average across the communes) as well as to decide what happens with the harvest (67% on average). Involvement in these decisions is greatest in Tchaourou, followed by Kalalé. Distinguishing per cluster, Bembéréké G1 stands out for lower decision-making power over the plot in comparison with other clusters. Another noticeable difference is that only one fifth of young men can choose the plot on which to work in Kalalé G2 and Tchaourou G2. A greater percentage of young men have their own plot to manage among richer households, but their decision-making power over the plot is lower than in households of differing wealth status.

Table 47 – Young men land management by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Make decisions over a plot	8.2%	8.5%	7.5%	11.5%	8.8%
N	282	139	144	119	684
Has own plot to manage	47.8%	38.5%	44.6%	24.8%	40.2%
N	282	139	144	119	684
<u>How long work on the current plot</u>					
Seasonal	41.8%	36.5%	18.4%	7.0%	28.4%
Annual	9.6%	6.4%	12.1%	7.8%	9.7%
Several years	9.9%	1.5%	20.2%	14.6%	12.9%
All my life	16.5%	34.1%	33.3%	15.2%	24.0%
Indefinite period	21.1%	21.5%	16.1%	55.5%	24.5%
N	135	49	64	30	278
May use HH equipment to work own plot	73.7%	86.2%	63.4%	92.7%	74.7%
N	135	49	64	30	278
Decide what is done with harvest of own plot	64.4%	74.3%	58.3%	86.7%	66.9%
N	135	49	64	30	278
Chooses which plot is own plot	37.7%	58.9%	38.3%	48.4%	42.1%
N	135	49	64	30	278
<u>If no: who decides?</u>					
HH member	92.4%	74.8%	86.8%	76.4%	86.8%
Owner (outside HH)	0.0%	4.7%	4.8%	6.6%	2.9%
Family head (outside HH)	4.4%	12.3%	5.4%	12.1%	6.4%
Local dignitary	1.8%	0.0%	0.0%	0.0%	0.8%
Other village member	0.8%	0.0%	0.0%	0.0%	0.3%
Nobody	0.8%	8.2%	3.1%	4.9%	2.8%
N	84	25	39	17	165

Table 48 - Young men land management by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Make decisions over a plot	5.8%	7.6%	7.1%	10.9%	9.8%	6.0%	8.9%	7.3%	8.9%	8.4%	16.6%	8.8%
N	105	100	70	50	67	34	34	43	62	52	67	684
Has own plot to manage	58.2%	37.1%	49.4%	50.4%	48.7%	39.1%	43.4%	34.0%	37.3%	21.8%	29.8%	40.2%
N	105	100	70	50	67	34	34	43	62	52	67	684
<u>How long work on the current plot</u>												
Seasonal	65.1%	15.8%	28.7%	28.1%	13.2%	31.4%	50.2%	12.9%	35.9%	0.0%	15.3%	28.4%
Annual	17.7%	4.6%	2.6%	24.1%	3.1%	11.0%	0.0%	12.1%	9.3%	0.0%	17.1%	9.7%
Several years	4.4%	19.5%	5.1%	16.8%	24.1%	11.0%	0.0%	0.0%	3.6%	2.2%	29.4%	12.9%
All my life	9.5%	34.9%	20.3%	16.1%	45.5%	5.1%	49.8%	48.5%	13.0%	23.1%	5.6%	24.0%
Indefinite period	3.4%	25.2%	43.3%	14.8%	14.2%	36.4%	0.0%	26.4%	38.1%	74.7%	32.6%	24.5%
N	59	36	34	24	31	15	12	15	22	10	20	278
May use HH equipment to work own plot	52.0%	86.9%	83.7%	70.5%	68.6%	61.9%	83.3%	82.4%	90.7%	1	83.9%	74.7%
N	59	36	34	24	31	15	12	15	22	10	20	278
Decide what is done with harvest of own plot	43.4%	77.4%	60.3%	73.1%	59.4%	61.9%	84.3%	57.1%	74.0%	88.4%	84.7%	66.9%
N	59	36	34	24	31	15	12	15	22	10	20	278
Chooses which plot is own plot	22.3%	37.4%	40.3%	48.3%	40.6%	51.7%	83.3%	17.6%	57.7%	70.8%	21.5%	42.1%
N	59	36	34	24	31	15	12	15	22	10	20	278
<u>If no: who decides?</u>												
HH member	96.0%	87.2%	94.3%	100.0%	87.1%	66.7%	68.7%	78.7%	73.2%	100.0%	65.9%	86.8%
Owner (outside HH)	0.0%	0.0%	0.0%	0.0%	0.0%	22.8%	31.3%	0.0%	0.0%	0.0%	9.5%	2.9%
Family head (outside HH)	1.1%	12.8%	5.7%	0.0%	6.5%	0.0%	0.0%	21.3%	7.9%	0.0%	17.5%	6.4%
Local dignitary	0.0%	0.0%	0.0%	0.0%	0.0%	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Other village member	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Nobody	1.4%	0.0%	0.0%	0.0%	6.5%	0.0%	0.0%	0.0%	18.9%	0.0%	7.1%	2.8%
N	43	23	20	12	19	6	2	13	10	2	15	165

Table 49 - Young men land management by wealth quartile

	Wealth quartile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
Make decisions over a plot	16.1%	3.9%	5.6%	3.7%	6.3%
N	86	148	126	157	517
Has own plot to manage	32.6%	39.5%	45.6%	46.4%	41.8%
N	86	148	126	157	517
How long work on the current plot					
Seasonal	14.3%	22.6%	21.4%	43.8%	28.4%
Annual	15.6%	4.8%	15.2%	11.2%	11.0%
Several years	13.1%	19.1%	10.1%	10.5%	13.2%
All my life	28.1%	26.0%	30.7%	13.1%	23.1%
Indefinite period	28.8%	27.4%	22.6%	21.4%	24.4%
N	28	61	53	74	216
May use HH equipment to work own plot	88.5%	92.2%	75.1%	58.4%	76.0%
N	28	61	53	74	216
Decide what is done with harvest of own plot	70.6%	77.9%	64.8%	52.5%	65.1%
N	28	61	53	74	216
Chooses which plot is own plot	42.5%	64.0%	30.9%	23.9%	39.3%
N	28	61	53	74	216
If no: who decides?					
HH member	81.8%	86.7%	90.2%	97.9%	91.8%
Owner (outside HH)	4.1%	0.0%	2.0%	1.1%	1.6%
Family head (outside HH)	14.1%	2.3%	6.5%	0.0%	4.0%
Nobody	0.0%	11.0%	1.3%	1.0%	2.6%
N	16	24	36	58	134

Few young men interviewed had already inherited land or been given it as a gift by their parents, such that it truly belonged to them. Most however expect to inherit land from their parents, in particular agricultural land. 72.6% of young men expect to inherit agricultural land from their parents. If they have the money to buy land they would be allowed to do so, and if they are allowed to do so virtually all would be able to register it in their own name. Once more, young men seem to enjoy a greater access to land in Tchaourou and a lower one in Bembéréké, in particularly in the cluster Bembéréké G1. Young men from richer households face a lower access to land.

Table 50 – Young men access to land by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Inherited / given non-agri land from parents	7,0%	8,4%	5,4%	12,7%	8,1%
Inherited / given agri land from parents	19,2%	20,5%	11,4%	20,2%	17,3%
Expect to inherit non-agri land from parents	58,8%	51,7%	34,2%	63,7%	51,5%
Expect to inherit agri land from parents	68,7%	75,5%	71,7%	77,7%	72,6%
Father allow young man to buy land?	82,0%	93,0%	93,6%	91,2%	89,0%
N	282	139	144	119	684
If can buy land, in young man's name? (N and % of those who can buy land)	99,3%	99,4%	98,6%	100,0%	99,2%
	238	129	135	109	611

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Table 51 - Young men access to land by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Inherited / given non-agri land from parents	2,0%	8,5%	9,1%	3,8%	6,7%	8,3%	9,5%	4,3%	9,8%	17,9%	4,2%	8,1%
Inherited / given agri land from parents	11,5%	20,6%	23,2%	6,1%	18,4%	12,3%	23,9%	21,8%	17,2%	24,8%	12,5%	17,3%
Expect to inherit non-agri land from parents	42,6%	74,8%	62,6%	21,8%	37,7%	34,7%	59,3%	32,9%	56,8%	65,9%	60,7%	51,5%
Expect to inherit agri land from parents	51,5%	85,6%	73,3%	74,3%	68,2%	66,8%	72,5%	66,8%	82,0%	76,7%	79,2%	72,6%
Father allow young man to buy land?	70,7%	85,8%	97,0%	96,9%	93,6%	89,4%	94,6%	90,0%	93,5%	88,3%	96,1%	89,0%
N	105	100	70	50	67	34	34	43	62	52	67	684
If can buy land, in young man's name?	100,0%	98,5%	100,0%	100,0%	100,0%	95,2%	100,0%	100,0%	98,5%	100,0%	100,0%	99,2%
(N and % of those who can buy land)	78	86	68	48	62	31	31	40	58	45	64	611

Table 52 - Young men access to land by wealth quartile

	Wealth quartile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
Inherited / given non-agri land from parents	12,7%	6,6%	10,2%	6,2%	8,4%
Inherited / given agri land from parents	20,2%	18,6%	17,2%	14,7%	17,4%
Expect to inherit non-agri land from parents	52,5%	63,9%	52,2%	43,7%	53,2%
Expect to inherit agri land from parents	81,0%	85,8%	73,5%	62,9%	75,0%
Father allow young man to buy land?	89,1%	91,7%	89,0%	85,0%	88,6%
N	86	148	126	157	517
If can buy land, in young man's name?	99,3%	100,0%	100,0%	98,0%	99,3%
(N and % of those who can buy land)	78	136	112	135	461

LAND TENURE STRUCTURES AT THE VILLAGE LEVEL

From the village level focus group discussion, we can see that in the majority (83%) of villages there is some institution which is involved in land management. Where something exists, there is always a village council (Conseil de village) and almost all of these are involved in land management. Most villages also have an elder’s council (70%) which is engaged in land management. 43% of villages had an SVGF already installed at baseline.

Figure 25 - Village institutions involved in land management



Institutions outside the village also have a role to play in land affairs, with 79% of villages experiencing the intervention of one of the institutions from [Figure 25](#) in land management. The most common external institution is the district council (Conseil d'arrondissement), which is involved in 73% of villages. Other institutions such as CoGEF are less frequently used and perhaps viewed as institutions to be used in more serious cases.

We are also interested in which institution is primarily responsible for a variety of tasks. In [Figure 27](#) it can be seen that for most tasks, the village council has a prominent role to play. It is the institution with the highest share of responses for all tasks except collecting taxes, for which the district council is primarily responsible. Also, in the case of implementing and raising awareness for a PFR the village council shares its prominent role with the SVGF. In general, the elder council and the SVGF typically play an important role, with a quarter of villages stating that the elder council has primary responsibility for helping to obtain land, planning land use and mediating conflicts. The general pattern suggests that the village council is on average the most active institution regarding land, but there remains quite some heterogeneity in which institution takes responsibility for various tasks.

Figure 26 - Non-village institutions involved in land management

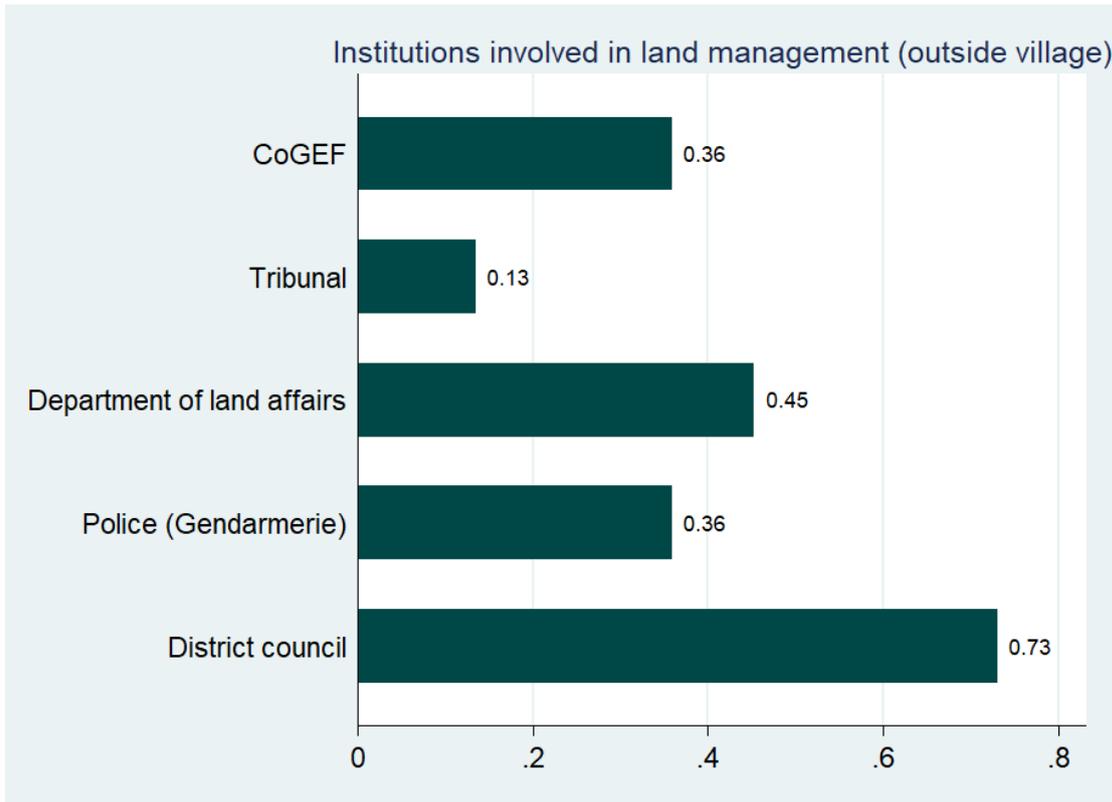
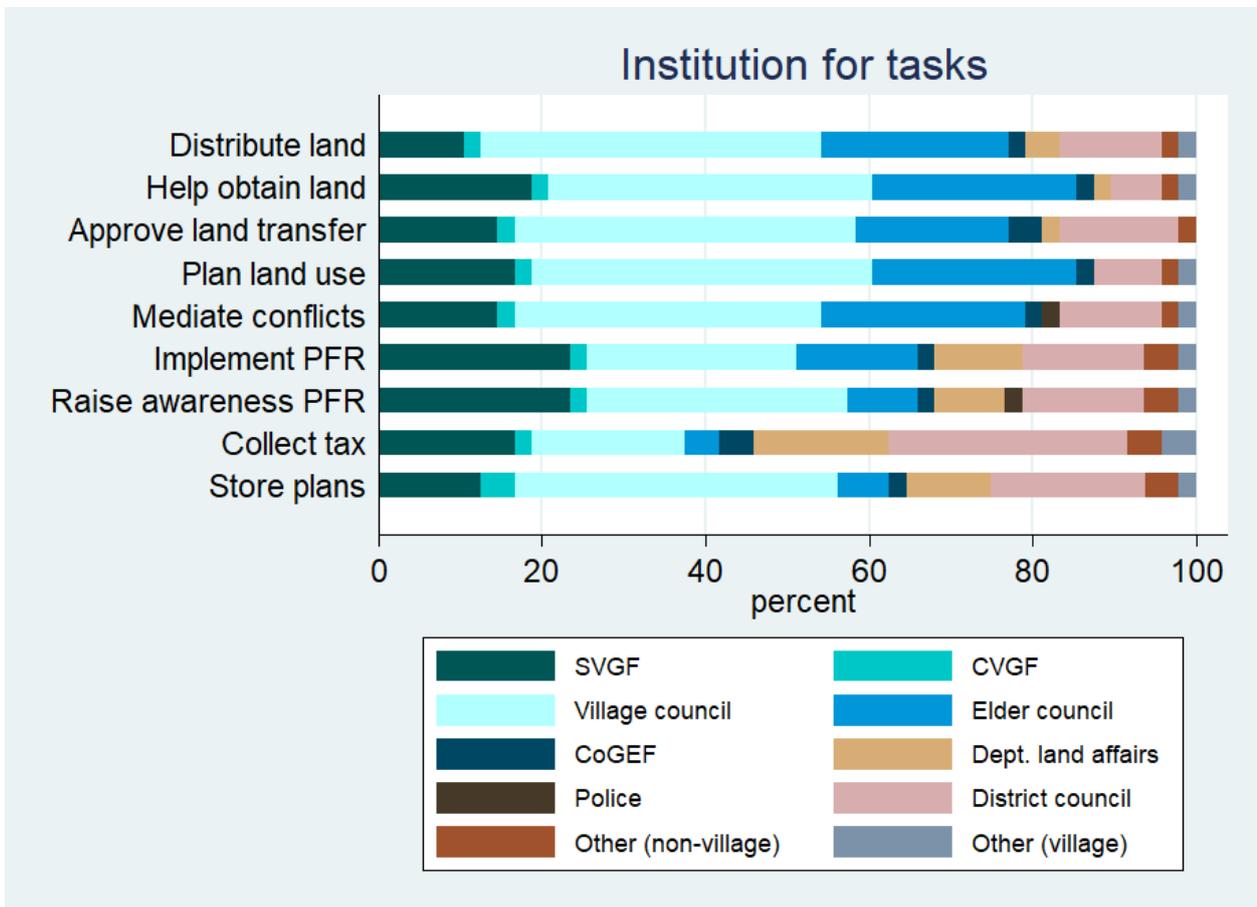


Figure 27 - Institutions for land related procedures



OUTPUTS

5.4 LAND CONFLICTS AND PERCEPTION OF LAND SECURITY

One of the reasons for clarifying land rights is to reduce conflict over land as well as to help in the process of solving any conflicts which arise. In this section, we examine the current level of conflict as well as examining the type of conflicts arising.

LAND CONFLICTS

This data was collected on the plot level for agricultural plots for which 806 plots were recorded as having been the subject of some form of conflict. This represents around 23% of all plots. 65% of the most recent conflicts have been resolved and 77% of those who have experienced a conflict, experienced their last conflict within the last 3 years.

Almost half of the most recent conflicts experienced were between farmers and livestock herders. It is noticeable that the problems with herders are more pronounced in Tchaourou than in the northern communes. This demonstrates the importance of finding a solution for livestock herders to move their animals without generating conflict. Distinguishing by clusters reveals some heterogeneity in the prevalence of conflicts between farmers and herders within the other communes, this issue being more common in Sinendé G3, Kalalé G1 and G2, though problems between herders and farmers are prevalent in both clusters within Tchaourou.

The second main source of conflict is boundary contestation or infringement, being mentioned for around 40% of conflicts with important variations across communes, which is an issue that a PFR can address. While it represents 10% of conflicts in Tchaourou, it is the cause of 57% of conflicts in Sinendé. Overall, the patterns for most recent and have ever experienced a certain type of conflict appear similar suggesting that the information gathered on the most recent conflict can give us a good impression of the conflicts faced as a whole.

The most common party with which a conflict occurred was another member of the same village, followed by another family/household member. This pattern varies a little by commune, with fewer issues with other village members in Kalalé and Sinendé. In Tchaourou, the conflicts are also more common with someone from outside the village, which is in line with the finding relating to the cattle herders.

The occurrence of conflicts does not differ by gender of the household head but a lower percentage of them have been resolved among female headed households. This difference is starker when we distinguish by gender of who takes decisions on the plot rather than that of the household head, with conflicts having been resolved on 50.4% of plots managed by a woman and 65.5% on plots managed by a man. Conflicts between farmers and herders and due to inheritance contestation are more prevalent among female headed households. Migrant households have experienced significantly more conflicts than non-migrant households (38% against 23% among non-migrants). The occurrence of conflicts also increases with household wealth.

Table 53 - Conflicts on agricultural plots by commune

	Commune				
	Bembéréké	Kalalé	Sinendé	Tchaourou	Total
Any conflict	18.6%	18.3%	22.9%	32.2%	23.1%
N	1553	936	733	741	3963
Conflict resolved?	59.9%	64.9%	60.7%	70.8%	64.7%
N	273	159	162	212	806
<i>Ever faced type of conflict (N conflicts, % of total plots)</i>					
Boundaries contestation / infringement	11.2%	8.94%	14.6%	4.21%	9.86%
N	1548	932	726	734	3940
Conflict between farmers and herders	9.16%	11%	8.76%	28.7%	14.5%
N	1539	925	717	738	3919
Boundaries with the State's properties	0.689%	0.663%	1.75%	0.588%	0.912%
N	1539	928	710	734	3911
Inheritance contestation	1.18%	2.54%	3.03%	0.88%	1.77%
N	1535	927	712	733	3907
Fraudulent sale	0.039%	0%	0%	0.612%	0.172%
N	1534	926	708	734	3902
Non-consensual contract breach	0.125%	0.0841%	0.925%	0.102%	0.303%
N	1534	925	712	735	3906
Other conflict related to property rights	1.14%	0.544%	1.29%	1.36%	1.14%
N	1534	927	711	737	3909
Other problem / conflict	0.115%	0.14%	0.293%	0.714%	0.318%
N	1524	924	700	739	3887
<i>Type: Last conflict (N conflicts, % of plots with conflicts)</i>					
Boundaries contestation / infringement	48.8%	40.9%	55.8%	7.9%	34.8%
Conflict between farmers and herders	37.5%	44.7%	24.8%	86.2%	52.9%
Boundaries with the State's properties	1.2%	1.3%	1.7%	0.0%	0.9%
Inheritance contestation	5.4%	8.1%	8.0%	1.5%	5.0%
Fraudulent sale	0.2%	0.0%	0.6%	0.0%	0.2%
Non-consensual contract breach	1.4%	0.5%	2.3%	0.0%	1.0%
Other conflict related to property rights	3.8%	3.2%	5.6%	2.8%	3.8%
Other problem / conflict	1.7%	1.4%	1.2%	1.4%	1.5%
<i>With whom: last conflict (N conflicts, % of plots with conflicts)</i>					
A household member	1.6%	0.8%	2.5%	0.6%	1.4%
The owner (outside the HH)	5.3%	16.7%	8.2%	2.2%	6.3%
Another family / household	20.5%	36.6%	17.6%	10.4%	18.2%
Household head (outside the HH)	1.0%	1.2%	4.2%	0.6%	1.6%
Another family member (outside the HH)	14.6%	13.7%	12.1%	3.1%	9.8%
A community elder	3.1%	5.0%	12.7%	2.4%	5.4%
Another village member	39.6%	17.5%	23.9%	34.9%	31.3%
Someone outside the village	9.6%	3.1%	11.3%	17.3%	12.0%
Agricultural group / cooperative	0.7%	0.6%	1.5%	0.0%	0.6%
Administrative authority	1.8%	1.4%	5.2%	0.8%	2.2%
Other	2.2%	3.3%	0.6%	27.7%	11.1%

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Table 54 - Conflicts on agricultural plots by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Any conflict	21.6%	19.8%	16.8%	22%	17.5%	24.8%	22.1%	20.9%	13.1%	29.8%	36.1%	23.1%
N	627	561	317	249	373	159	260	307	369	346	395	3963
Conflict resolved?	43.9%	66.5%	71.5%	69.5%	62.3%	61.9%	61.6%	72.1%	62.3%	73%	68%	64.7%
N	126	102	53	56	66	32	53	55	51	67	145	806
<i>Ever faced type of conflict (N conflicts, % of total plots)</i>												
Boundaries contestation / infringement	12.1%	13.9%	9.86%	16.5%	12.7%	7.83%	9.62%	9.61%	7.86%	3.02%	6.08%	9.86%
N	626	559	315	247	369	158	258	305	369	344	390	3940
Conflict between farmers and herders	12.7%	7.63%	8.63%	4.13%	4.45%	18%	17.1%	14.7%	3.07%	27.1%	31.4%	14.5%
N	620	555	316	242	364	159	254	304	367	345	393	3919
Boundaries with the State's properties	1.28%	0.409%	0%	3.31%	0.503%	2.03%	0%	2.19%	0.218%	0.837%	0.201%	0.912%
N	622	553	315	241	359	159	256	305	367	341	393	3911
Inheritance contestation	1.6%	1.46%	0.696%	1.42%	2.42%	4.05%	2.9%	1.84%	2.7%	0.416%	1.61%	1.77%
N	623	549	314	242	360	159	256	304	367	342	391	3907
Fraudulent sale	0%	0%	0.377%	0%	0%	0%	0%	0%	0%	0%	1.57%	0.172%
N	622	551	314	239	359	157	256	304	366	341	393	3902
Non-consensual contract breach	0.0783%	0.205%	0%	0.671%	0.898%	1.01%	0%	0%	0.218%	0%	0.262%	0.303%
N	622	550	313	241	361	159	256	302	367	343	392	3906
Other conflict related to property rights	0.868%	0.995%	0.558%	2.53%	0.587%	2.47%	0.307%	1.35%	0.201%	0%	3.49%	1.14%
N	620	551	314	241	362	157	255	305	367	343	394	3909
Other problem / conflict	0%	0.248%	0%	0%	0%	1.03%	0%	0%	0.364%	0.632%	0.841%	0.318%
N	615	551	309	237	355	157	255	304	365	344	395	3887

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Type: Last conflict (N conflicts, % of plots with conflicts)

Boundaries contestation / infringement	41.6%	58.5%	49.0%	65.2%	65.8%	29.6%	39.1%	27.4%	58.6%	4.5%	12.5%	34.8%
Conflict between farmers and herders	45.7%	26.2%	40.9%	8.4%	17.7%	52.5%	50.9%	58.0%	20.3%	92.0%	78.7%	52.9%
Boundaries with the State's properties	0.5%	2.0%	0.0%	6.3%	0.0%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	0.9%
Inheritance contestation	6.4%	5.8%	6.3%	6.6%	10.0%	4.1%	6.0%	2.2%	17.8%	1.4%	1.7%	5.0%
Fraudulent sale	0.0%	1.0%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Non-consensual contract breach	1.0%	1.0%	0.0%	5.9%	1.8%	1.9%	0.0%	0.0%	1.7%	0.0%	0.0%	1.0%
Other conflict related to property rights	2.5%	4.2%	1.6%	7.5%	4.6%	7.9%	2.7%	5.3%	1.5%	0.0%	6.6%	3.8%
Other problem / conflict	2.5%	1.2%	0.0%	0.0%	0.0%	4.1%	1.3%	2.7%	0.0%	2.1%	0.5%	1.5%

With whom: last conflict (N conflicts, % of plots with conflicts)

A household member	1.0%	2.3%	5.7%	2.6%	3.2%	0.0%	0.0%	2.5%	0.0%	0.3%	1.1%	1.4%
The owner (outside the HH)	1.4%	7.9%	8.5%	15.1%	6.2%	6.0%	25.6%	17.5%	2.1%	0.0%	5.0%	6.3%
Another family / household	7.8%	36.7%	9.4%	22.1%	16.9%	9.4%	44.4%	21.1%	41.7%	0.3%	23.5%	18.2%
Household head (outside the HH)	1.0%	2.0%	5.7%	7.2%	2.9%	0.0%	1.0%	2.5%	0.0%	0.3%	1.0%	1.6%
Another family member (outside the HH)	15.1%	16.7%	5.7%	6.6%	17.5%	8.2%	5.6%	13.9%	26.1%	3.8%	2.2%	9.8%
A community elder	4.8%	4.1%	10.1%	12.7%	11.9%	8.2%	3.0%	10.0%	2.8%	0.5%	4.9%	5.4%
Another village member	53.1%	17.4%	42.4%	17.6%	26.2%	41.8%	9.8%	20.9%	25.7%	39.4%	29.1%	31.3%
Someone outside the village	11.2%	9.8%	1.6%	5.2%	8.3%	20.4%	4.0%	4.7%	0.0%	10.8%	25.8%	12.0%
Agricultural group / cooperative	1.6%	0.0%	0.0%	0.0%	0.8%	4.1%	1.3%	0.0%	0.0%	0.0%	0.0%	0.6%
Administrative authority	2.4%	2.0%	2.0%	10.2%	4.8%	0.0%	0.0%	3.3%	1.7%	0.0%	1.8%	2.2%
Other	0.8%	1.0%	9.0%	0.7%	1.2%	1.9%	5.3%	3.6%	0.0%	44.7%	5.5%	11.1%

Table 55 - Conflicts on agricultural plots by gender of HH head

	HH head gender		
	Male	Female	Total
Any conflict	24.9%	24.1%	24.9%
N	2420	161	2581
Conflict resolved?	65.8%	58.9%	65.3%
N	527	36	563
Type: Last conflict (N conflicts, % of plots with conflicts)			
Boundaries contestation / infringement	35.0%	25.5%	34.4%
Conflict between farmers and herders	53.2%	62.0%	53.8%
Boundaries with the State's properties	0.7%	0.0%	0.6%
Inheritance contestation	4.2%	10.8%	4.6%
Fraudulent sale	0.2%	0.0%	0.2%
Non-consensual contract breach	1.0%	0.0%	0.9%
Other conflict related to property rights	3.9%	1.8%	3.8%
Other problem / conflict	1.8%	0.0%	1.7%

Table 56 - Conflicts on agricultural plots by migration status

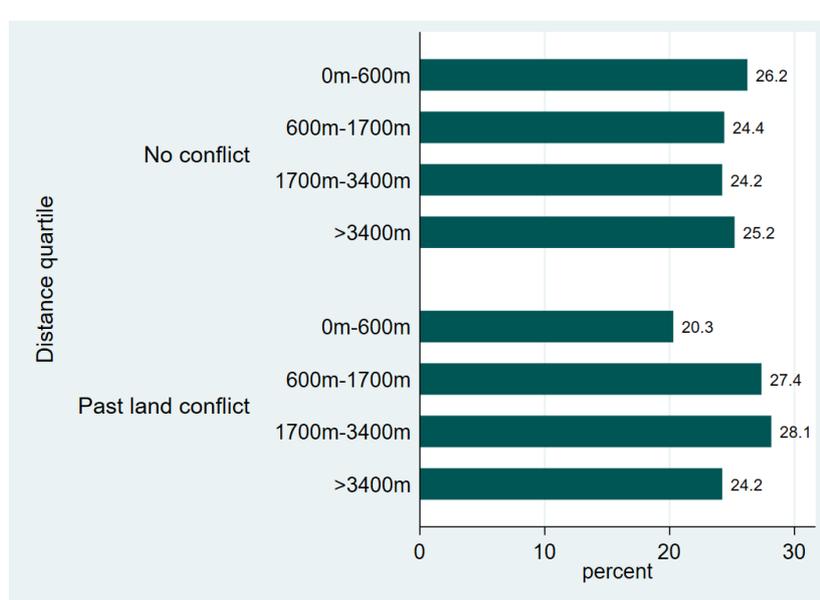
	Migrant Status		
	Non-Migrant	Migrant	Total
Any conflict	23%	37.9%	24.9%
N	2280	301	2581
Conflict resolved?	65.4%	65.3%	65.3%
N	467	96	563
Type: Last conflict (N conflicts, % of plots with conflicts)			
Boundaries contestation / infringement	38.6%	16.7%	34.4%
Conflict between farmers and herders	50.3%	68.3%	53.8%
Boundaries with the State's properties	0.8%	0.0%	0.6%
Inheritance contestation	5.6%	0.6%	4.6%
Fraudulent sale	0.2%	0.0%	0.2%
Non-consensual contract breach	0.6%	2.4%	0.9%
Other conflict related to property rights	2.3%	9.8%	3.8%
Other problem / conflict	1.6%	2.1%	1.7%

Table 57 - Conflicts on agricultural plots by wealth quartile

	Wealth quartile				Total
	Lowest quintile (poorest)	Second	Third	Highest quintile (richest)	
Any conflict	21.3%	25.5%	29.9%	30.9%	26.8%
N	476	491	464	477	1908
Conflict resolved?	64.6%	70.1%	66.2%	57.4%	64.3%
N	94	111	118	124	447
Type: Last conflict (N conflicts, % of plots with conflicts)					
Boundaries contestation / infringement	38.4%	34.4%	27.3%	34.2%	33.2%
Conflict between farmers and herders	56.9%	54.8%	59.5%	53.2%	56.0%
Boundaries with the State's properties	0.0%	0.0%	1.1%	0.3%	0.4%
Inheritance contestation	0.0%	7.5%	5.6%	4.9%	4.7%
Fraudulent sale	0.0%	0.0%	0.0%	0.9%	0.2%
Non-consensual contract breach	3.8%	0.3%	0.9%	0.0%	1.1%
Other conflict related to property rights	1.0%	3.0%	4.4%	2.3%	2.8%
Other problem / conflict	0.0%	0.0%	1.2%	4.2%	1.5%

As illustrated by Figure 28, fewer land conflicts occurred on agricultural plots very close to the household residence.

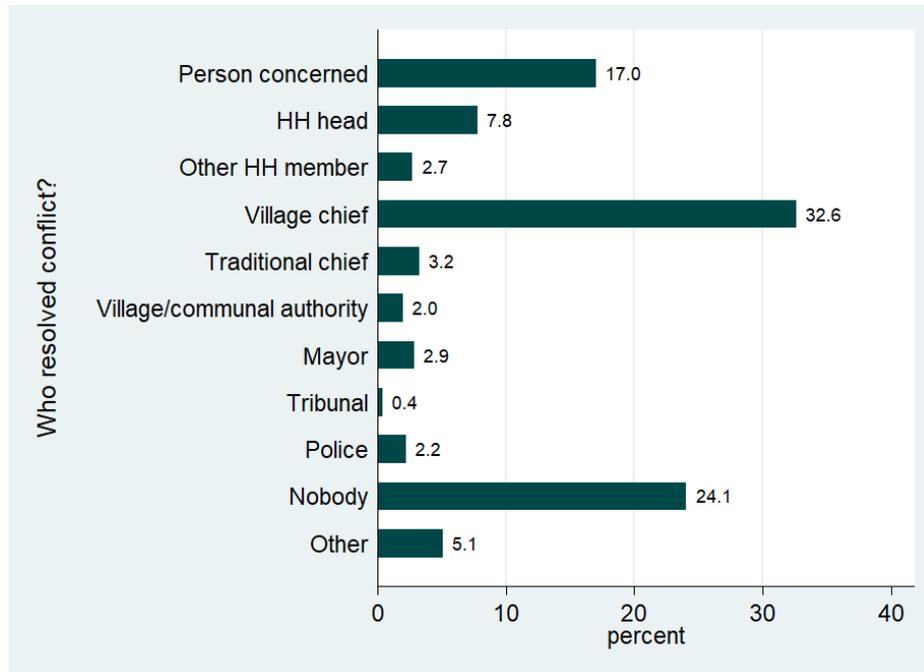
Figure 28 - Conflicts by plot distance



We analyse how households seek to resolve the land conflicts faced under the current set of institutions. In Figure 29 it can be seen that the most common person or institution to resolve a conflict is the village chief with 32.6% of conflicts solved by the village chief (or currently being dealt with by the village chief), followed by the response nobody. Only 2% of the most recent conflicts faced on a plot were solved by a village or communal authority such as an SVGF. The introduction of SVGFs

in the villages aims to provide a new institution to help resolve conflict and this should be considered again at endline.

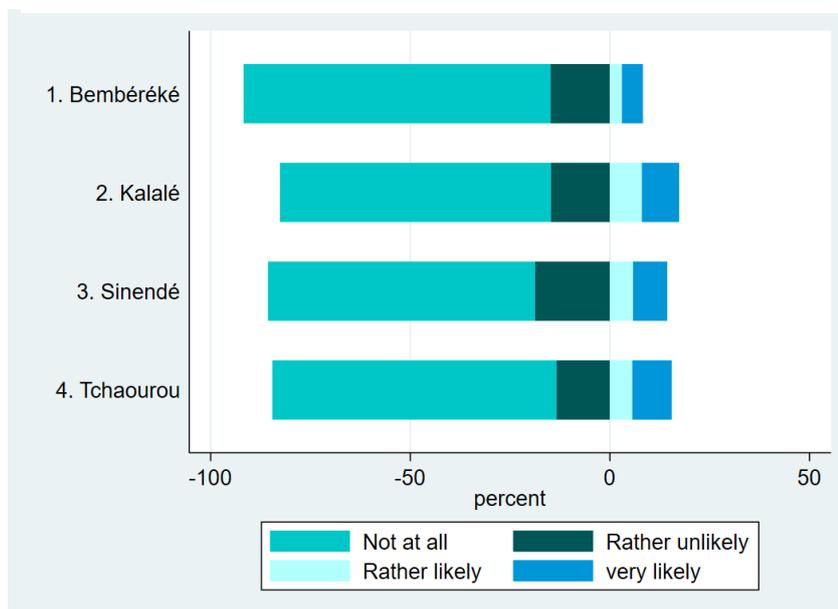
Figure 29 - Who resolved the last conflict?



PERCEPTION OF LAND SECURITY

If households are to invest more in their plots, to improve the soil fertility through fallowing for example, they will need to feel that the land is secure. The individual managing a plot is not afraid of losing rights over the plot in 71% of the recorded plots. This figure is no different even if only plots managed by the household head are considered, though this could be due to the fact that so many of the plots are managed by the household head (the household head is one of the decision makers for 97% of plots).

Figure 30 - Risk of losing a plot in next 5 years



We also consider what issues would lead to a respondent to fear losing a plot. The most likely reasons are the occupation of the plot by someone else (13%), the reallocation of the plot (12.5%) and infringement (8.6%). Respondents stated nothing could make lose land them for 58.5% of the plots in the survey. Overall this suggests that households already feel quite secure about their access to continue working on the same plots. Nonetheless, households feel that they are very likely to lose land rights over 7.6% of plots which may lead to suboptimal investment. These patterns do not differ much by commune, nor cluster and gender of the household head. A noticeable difference arises by migration status, with around 40% of them stating that nothing could make them lose land while this percentage is as high as 59% among non-migrants.

Table 58 - Reasons to fear losing plot by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<i>What would make you fear losing plot</i>					
Reallocation of the plot	6.4%	11.6%	12.4%	21.0%	12.5%
Occupation by someone else	11.0%	13.6%	20.1%	8.2%	12.9%
Infringement	13.3%	11.9%	8.3%	0.4%	8.6%
Risk of conflict	5.0%	4.0%	5.3%	7.8%	5.6%
Loss of documents	0.9%	0.6%	0.1%	0.3%	0.5%
Nothing	61.4%	57.8%	53.3%	60.1%	58.5%
Other	2.1%	0.6%	0.4%	2.2%	1.4%
N	244	87	77	50	458

Table 59 - Reasons to fear losing plot by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<i>What would make you fear losing plot</i>												
Reallocation of the plot	5.7%	7.1%	10.8%	15.6%	11.6%	6.9%	3.1%	13.8%	17.9%	13.4%	33.0%	12.5%
Occupation by someone else	11.6%	15.6%	4.6%	22.5%	16.2%	14.2%	16.6%	8.1%	14.7%	8.0%	8.6%	12.9%
Infringement	8.6%	16.5%	16.6%	6.7%	7.9%	12.2%	10.2%	13.6%	12.3%	0.2%	0.7%	8.6%
Risk of conflict	7.2%	3.8%	3.8%	3.4%	5.2%	6.0%	3.2%	5.2%	3.9%	10.2%	4.0%	5.6%
Loss of documents	1.2%	0.8%	0.3%	0.5%	0.0%	0.0%	0.7%	0.8%	0.4%	0.0%	0.7%	0.5%
Nothing	62.6%	54.9%	62.9%	50.8%	58.8%	59.7%	66.0%	58.1%	50.0%	67.5%	48.5%	58.5%
Other	3.0%	1.5%	1.1%	0.5%	0.2%	0.9%	0.3%	0.5%	0.9%	0.7%	4.4%	1.4%
N	124	54	51	30	36	26	17	29	41	18	32	458

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Table 60 - Reasons to fear losing plot by migration status

	Migrant Status		
	Non Migrant	Migrant	Total
<i>What would make you fear losing plot</i>			
Reallocation of the plot	10.9%	26.8%	13.0%
Occupation by someone else	12.9%	18.7%	13.7%
Infringement	9.4%	3.0%	8.6%
Risk of conflict	6.4%	7.3%	6.5%
Loss of documents	0.5%	0.0%	0.4%
Nothing	58.6%	39.9%	56.2%
Other	1.3%	4.4%	1.6%
N	430	28	458

Table 61 - Who could take the plot if left insecure, by commune

Who could take the plot	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
N	586	394	360	325	1665
Migrants	29,6%	18,1%	33,5%	11,5%	24,3%
Neighbors (non-migrants)	52,7%	36,6%	57,3%	28,7%	45,4%
Government	63,7%	59,1%	57,3%	57,8%	59,7%
Town hall	71,6%	62,5%	59,2%	64,8%	65,0%
Village chief	43,1%	34,6%	38,0%	36,6%	38,7%
Land chief	42,6%	26,2%	36,0%	53,6%	40,8%
Religious/traditional chief	28,5%	23,4%	25,0%	20,9%	24,8%
SVGF	29,4%	21,9%	32,2%	15,7%	25,5%
NGO/association	19,0%	21,3%	14,1%	9,3%	15,7%

Among households reporting fearing losing their land, 65% of them fear that their plot to be taken by the town hall and 60% by the government, which may indicate some distrust in local institutions. 24.3% of households fear their plot to be taken by migrants, this percentage being lower in Tchaourou and higher in Sinendé. This percentage differs greatly by cluster, being particularly high in Bembéréké G1.

Table 62 - Who could take the plot if left insecure, by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
N	230	245	118	138	158	57	78	129	187	117	208	1665
Migrants	60,1%	13,1%	8,0%	24,5%	35,1%	39,8%	29,7%	15,2%	12,4%	15,3%	7,7%	24,3%
Neighbors (non-migrants)	59,1%	59,0%	26,8%	48,1%	63,1%	42,6%	61,1%	34,2%	22,6%	33,3%	24,1%	45,4%
Government	79,9%	51,5%	73,8%	53,8%	62,0%	49,7%	34,5%	55,2%	76,8%	61,2%	54,3%	59,7%
Town hall	78,5%	64,6%	77,7%	55,5%	63,1%	58,0%	39,2%	55,6%	81,0%	69,9%	59,6%	65,0%
Village chief	64,6%	19,6%	53,5%	41,4%	41,6%	44,5%	21,9%	29,5%	45,4%	21,2%	51,9%	38,7%
Land chief	60,9%	23,1%	57,9%	36,1%	43,8%	31,3%	17,8%	22,5%	33,6%	39,4%	67,8%	40,8%
Religious/traditional chief	52,8%	11,5%	22,0%	28,3%	28,9%	17,2%	17,6%	17,7%	30,3%	28,5%	13,2%	24,8%
SVGF	43,7%	11,6%	55,3%	37,4%	37,5%	24,6%	11,3%	8,0%	36,6%	1,8%	29,6%	25,5%
NGO/association	32,5%	8,7%	18,1%	17,7%	10,5%	18,8%	12,3%	10,7%	33,1%	6,9%	11,8%	15,7%

5.5 ACCESS TO FINANCE

Another often cited reason to introduce documentation for land holding is that land can then be used as collateral to obtain credit. If this is true, then making it easier for households to obtain documentation may enable them to receive a loan and then invest to increase their productivity.

In our sample, 13.7% of adult household members have applied for a loan, with the vast majority (98.1%) of those receiving a loan. This barely varies between communes, though the average amount borrowed by successful applicants does vary considerably. However, this is skewed by one very large loan, which may be due to the enumerator entering 25000 when 25 should have been entered (as loans were recorded in thousands FCFA). In order to receive a loan, 61% of borrowers were not required to show any documents. Of those that were, the highest declared category was “other administrative document”. So few applicants were rejected that we cannot draw any conclusions about which documents were requested in the loan process leading to individuals failing to get credit. No individual in 74% of households ever received a loan, with a similar number of households having ever applied for a loan. Loan applications vary greatly by cluster being as low as 7% in Bembéréké G1, Bembéréké G3 and Kalalé G1.

Table 63 - Loans and documents required by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Ever asked for a loan	11.4%	11.8%	15.2%	16%	13.7%
N	3374	1931	1964	1656	8925
Ever received a loan	97.3%	97.7%	99.1%	98%	98.1%
N	367	260	282	221	1130
Amount borrowed (mean, thousand FCFA)	184.5	1458.4	224.5	236.8	372.2
Documents requested (last loan obtained)					
Land title	0.355%	0%	1.54%	0%	0.603%
Rural land certificate	0%	0%	0%	0%	0%
Certificate of custody (CDA)	0.42%	0%	0%	0%	0.109%
Rental lease	0.42%	0%	0%	0%	0.109%
Permit to live	0%	0%	0.446%	0%	0.148%
Sales agreement certified by a town hall	1.61%	0.629%	1.53%	1.22%	1.35%
Other administrative document	11%	16.5%	4.92%	8.82%	9.04%
Other non-administrative document	4.77%	7.08%	3.48%	4.02%	4.42%
Unofficial sales agreement	0%	0.908%	0.26%	0%	0.2%
Other document evidencing a transaction	9.6%	8.51%	15.8%	60.1%	25.8%
No document	74.4%	69%	73.6%	29.7%	60.8%
Documents demanded for last loan					
Land title	0%	0%	0%	0%	0%
Rural land certificate	0%	0%	0%	0%	0%
Certificate of custody (CDA)	30.3%	0%	0%	7.25%	13.7%
Rental lease	0%	0%	0%	0%	0%
Permit to live	30.3%	0%	0%	0%	11.5%
Sales agreement certified by a town hall	38.5%	0%	0%	51.2%	30.2%
Other administrative document	14.7%	19.8%	0%	0%	8.64%
Other non-administrative document	14.7%	0%	0%	0%	5.58%
Unofficial sales agreement	0%	0%	0%	7.25%	2.21%
Other document evidencing a transaction	0%	0%	0%	26.3%	8.02%
No document	46.8%	80.2%	100%	22.5%	53.1%

Table 64 - Loans and documents required by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Ever asked for a loan	22.4%	6.79%	5.99%	11.4%	14.4%	16%	7.37%	10.8%	17.2%	17.9%	13%	13.7%
N	1266	1156	889	670	1001	356	565	664	702	763	893	8925
Ever received a loan	99.5%	91.7%	100%	97.3%	100%	98.8%	98%	95.6%	98.6%	99.6%	94.7%	98.1%
N	261	71	52	76	146	43	48	88	124	99	122	1130
Amount borrowed (mean, thousand FCFA)	156.6	201.4	283.2	236.0	253.5	195.1	321.1	5140.4	202.1	172.6	378.1	372.2
Documents requested (last loan obtained)												
Land title	0.486%	0%	0%	2.79%	0.54%	2.73%	0%	0%	0%	0%	0%	0.603%
Rural land certificate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Certificate of custody (CDA)	0%	1.58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.109%
Rental lease	0%	1.58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.109%
Permit to live	0%	0%	0%	0%	0.926%	0%	0%	0%	0%	0%	0%	0.148%
Sales agreement certified by a town hall	0.728%	3.12%	3.32%	2.31%	0.735%	2.73%	0%	1.07%	0.697%	0%	3.9%	1.35%
Other administrative document	10.7%	5.96%	16.3%	1.64%	5.96%	7.98%	27.8%	17.6%	10.8%	8.34%	9.89%	9.04%
Other non-administrative document	1.4%	3.16%	16.9%	2.79%	6%	5.04%	14.3%	11.4%	1.79%	4.73%	2.45%	4.42%
Unofficial sales agreement	0%	0%	0%	0%	0.54%	0%	3.92%	0%	0%	0%	0%	0.2%
Other document evidencing a transaction	7.23%	18.1%	10%	24.2%	15.2%	9.45%	18.9%	10.9%	2.69%	69.9%	38.4%	25.8%
No document	80.5%	72.8%	55.7%	69.7%	70.4%	74.8%	38.9%	62.6%	85.6%	19.3%	52.6%	60.8%

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Documents demanded for last loan										
Land title	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rural land certificate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Certificate of custody (CDA)	0%	35%	0%	0%	0%	0%	0%	50%	0%	13.7%
Rental lease	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Permit to live	0%	35%	0%	0%	0%	0%	0%	0%	0%	11.5%
Sales agreement certified by a town hall	0%	44.4%	0%	0%	0%	0%	0%	100%	42.9%	30.2%
Other administrative document	0%	0%	0%	100%	100%	0%	0%	0%	0%	8.64%
Other non-administrative document	0%	0%	0%	100%	0%	0%	0%	0%	0%	5.58%
Unofficial sales agreement	0%	0%	0%	0%	0%	0%	0%	50%	0%	2.21%
Other document evidencing a transaction	0%	0%	0%	0%	0%	0%	0%	0%	30.8%	8.02%
No document	100%	55.6%	100%	0%	0%	100%	100%	0%	26.3%	53.1%

Access to finance could be particularly beneficial if it is invested in productive assets. We see in [Table 65](#) that the two main uses of loans are the purchase of inputs and investment in a non-agricultural economic activity. While the purchase of inputs (such as seeds, plants, fertiliser and pesticides) does not necessarily have a long-term effect on income, the investment in non-agricultural activities or businesses shows that credit can be used to help households diversify their income streams.

Table 65 - Use of loans received

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Use of loan					
Purchase of agricultural inputs	160	105	116	54	435
	38.90%	43.80%	39.60%	23.20%	35.30%
Purchase of agricultural equipment	23	14	30	4	71
	7.64%	7.14%	9.21%	1.02%	6.23%
Investment in a non-agricultural economic activity	88	83	74	133	378
	25.00%	31.60%	26.90%	67.10%	38.30%
Housing	3	6	1	5	15
	1.03%	2.38%	0.35%	3.21%	1.59%
Health	24	17	15	10	66
	7.37%	5.62%	7.31%	3.09%	5.92%
Ceremonies	57	14	35	2	108
	18.60%	4.93%	14.40%	0.36%	10.40%
Other	5	14	8	6	33
	1.50%	4.51%	2.15%	2.06%	2.25%
N	360	253	279	214	1106

OUTCOMES

5.6 FARMING SYSTEMS, AGRICULTURAL INPUTS AND INVESTMENT ON THE PLOTS

PRIMARY AND SECONDARY CROPS

Our survey allowed respondents to give answers about the number of fields on each agricultural plot and two crops per field. In all communes, maize is the most common crop to be cultivated, representing the primary crop on 38.6% of fields. Maize is followed by cotton (15%), soy (11.5%), sorghum/millet (10.4%) and yams (10%). There is some variation in main cultivated crops per commune, more clearly marked between the North and the South of Borgou. Cotton represents the second main cultivated crop in Bembéréké, Kalalé and Sinendé. In contrast, cotton cultivation is virtually non-existent in Tchaourou (0.3% of fields). Yams, cashews and manioc are the other main cultivated crops in this commune, while the cultivation of cashews and manioc are very low in other communes. These statistics contrast with the official statistics produced by INSAE (in the “Cahiers des Villages, 2016”) which state that in Tchaourou and Kalalé the most important crop is yams, though maize and sorghum are also high on the list. Monoculture is dominant, ranging from around 80% of fields in Tchaourou and Kalalé to more than 97% in Sinendé. Distinguishing by cluster also reveals some heterogeneity within communes in primary and secondary crops.

In most areas, sorghum/millet is the most common secondary crop on a field. In Sinendé very few people reported growing a secondary crop on the same field and those who did had other primary crops. As a result, in this commune, maize is the most common crop cultivated on a field, either as the primary crop or as the secondary crop. Once more, differences between Northern and Southern Borgou arise, with manioc and yams being the other main secondary crops in Tchaourou, while these are maize and soy in Bembéréké and Kalalé. The growing of manioc as a secondary crop in Tchaourou, (especially cluster 10) is mirrored in the growing technique used, primarily being mounds.

Male household heads make decisions on around 95% of the plots. According to the young men module, around 8% make decisions on plots. This represents, however, a low percentage of recorded plots, young men being involved in the decisions of only 1.8% of them and most commonly jointly with the male household head (1.2%). It is noticeable that this figure, as reported by the household head, seems to suggest that young men are less involved in decision making than they claim themselves (in [Table 47](#) it can be seen that roughly 40% of young men claim to manage a plot and even 8% making the decisions on plots). Women make decisions on 7.3% of plots, the majority of them being female household heads (4.1% of the plots). In male headed households 1.2% of plots are managed only by women and 2% are jointly managed with the head. The percentage of plots for which women are the sole decision maker is small in Bembéréké and Kalalé, accounting for less than 3% of the plots, but higher in Sinendé and Tchaourou (7.3% and 7.9% respectively), in line with a greater percentage of female heads in these communes (7.9% and 10.6% respectively). Due to the low percentage of plots young men make decisions on, the rest of the analysis distinguishes between male and female managers. Regarding differences in crops between Northern and Southern Borgou, we also separate by location. In both areas, fewer women’s plots are being cultivated with sorghum/millet, yams and cotton than men’s, but more for cashews, with a larger difference in Tchaourou. In Northern Borgou, noticeably more women’s plots are being cultivated for soy and fewer for cotton, while in Tchaourou more women’s plots are devoted to manioc. To see whether women grow fewer cash crops than men, we compute the percentage of plots on which cash crops are cultivated, as the primary or the secondary crop, by plot manager. There is barely any difference between male and female household heads’ plots (around 23% of plots). The percentage of plots on

which cash crops are grown is lower when the household head is not managing the plot, particularly so for women’s plots in male headed households (14%). In contrast, this percentage is higher for plots managed by several household members, notably when a young man manages it jointly with a male household head (28%).

Primary crops differ a little by ethnicity of the household head. Peulh and related households are relatively more involved in the cultivation of sorghum/millet. In Northern Borgou, Yoruba and related households are more involved in the cultivation of soy and in the cultivation of cashews and manioc in Tchaourou. Other ethnic group are relatively more involved in the cultivation of other primary crops, such as cowpeas/beans and peanuts. A similar pattern arises when we distinguish between migrant and non-migrant households, with migrant households being more involved in the cultivation of other primary crops (13.5%).

Table 66 - Primary and secondary crops by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Main crop					
Maize	41.0%	36.9%	39.9%	35.2%	38.6%
Sorghum / mil	13.4%	10.1%	11.1%	6.1%	10.4%
Soy	12.1%	12.6%	11.1%	10.6%	11.5%
Yams	7.7%	10.7%	7.4%	15.3%	10.0%
Cotton	17.3%	19.6%	22.9%	0.3%	15.0%
Cashew	1.5%	2.4%	2.5%	13.2%	4.8%
Manioc	1.9%	0.7%	1.6%	10.4%	3.8%
Other	5.1%	6.9%	3.4%	8.9%	5.8%
N	2493	1418	1365	1242	6518
Secondary crop					
Maize	25.4%	11.6%	32.5%	4.8%	13.2%
Sorghum / mil	27.6%	50.3%	23.7%	29.8%	33.4%
Soy	17.5%	10.1%	10.9%	9.5%	11.9%
Yams	6.1%	5.7%	5.0%	11.5%	8.5%
Cotton	3.2%	9.1%	2.4%	0.0%	2.9%
Cashew	0.6%	1.9%	12.3%	5.2%	3.6%
Manioc	4.3%	0.7%	3.1%	25.2%	13.2%
Niebe / beans	4.1%	3.6%	5.5%	6.9%	5.4%
Other	11.1%	7.1%	4.7%	7.1%	8.0%
N	253	248	38	246	785

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Table 67 - Primary and secondary crops by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Main crop												
Maize	39.6%	44.4%	43.0%	40.9%	40.5%	33.8%	39.3%	38.6%	33.9%	34.1%	36.5%	38.6%
Sorghum / mil	13.2%	12.9%	10.9%	10.6%	14.2%	9.3%	9.3%	12.3%	9.5%	3.9%	8.8%	10.4%
Soy	15.8%	5.0%	12.9%	9.9%	9.4%	21.5%	15.7%	12.5%	10.1%	5.9%	16.4%	11.5%
Yams	11.5%	5.5%	4.7%	7.1%	7.3%	7.2%	12.9%	7.3%	10.8%	14.6%	16.2%	10.0%
Cotton	11.0%	25.4%	18.7%	26.6%	21.7%	15.5%	17.1%	17.8%	22.9%	0.0%	0.7%	15.0%
Cashew	2.6%	0.9%	0.8%	2.5%	2.8%	1.4%	1.8%	2.1%	3.0%	17.3%	8.1%	4.8%
Manioc	2.2%	1.8%	1.6%	0.6%	0.7%	3.9%	1.8%	0.2%	0.2%	15.6%	4.0%	3.8%
Other	4.3%	4.2%	7.5%	1.8%	3.4%	7.2%	2.1%	9.3%	9.4%	8.6%	9.2%	5.8%
N	1040	859	515	461	678	305	375	440	603	513	729	6518
Secondary crop												
Maize	25.4%	36.0%	24.2%	13.5%	46.6%	8.3%	16.7%	9.6%	7.4%	4.7%	5.2%	13.2%
Sorghum / mil	18.6%	29.4%	35.0%	33.2%	16.9%	41.5%	46.8%	43.3%	57.0%	24.5%	41.6%	33.4%
Soy	22.2%	13.0%	29.3%	0.0%	10.3%	14.3%	10.0%	13.5%	8.7%	8.6%	11.4%	11.9%
Yams	10.6%	2.2%	3.3%	12.7%	0.0%	2.8%	9.2%	0.0%	4.7%	12.0%	10.6%	8.5%
Cotton	5.4%	2.5%	0.0%	0.0%	5.1%	0.0%	6.9%	13.9%	9.0%	0.0%	0.0%	2.9%
Cashew	1.4%	0.0%	0.0%	16.8%	12.4%	0.0%	1.9%	1.1%	2.1%	5.0%	5.4%	3.6%
Manioc	2.7%	5.6%	3.3%	7.9%	0.0%	5.5%	0.0%	2.2%	0.7%	32.1%	10.0%	13.2%
Niebe / beans	5.7%	1.9%	0.0%	7.9%	5.1%	5.5%	3.2%	4.9%	3.5%	6.7%	7.3%	5.4%
Other	7.8%	9.4%	4.9%	7.9%	3.6%	22.1%	5.3%	11.5%	6.9%	6.4%	8.6%	8.0%
N	111	76	35	17	17	35	71	59	118	115	131	785

Table 68 - Plot manager by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<i>Who takes the decisions on the plot?</i>					
Household head	92.9%	95.6%	88.6%	89.7%	91.3%
Woman HHH	2.2%	2.1%	6.1%	5.8%	4.1%
Other woman	0.6%	0.5%	1.2%	2.1%	1.2%
Woman and male HHH	3.0%	0.9%	2.7%	0.7%	2.0%
Woman and young man	0.3%	0.1%	0.3%	0.9%	0.4%
<i>A woman is involved</i>	<i>5.8%</i>	<i>3.5%</i>	<i>10.0%</i>	<i>8.6%</i>	<i>7.3%</i>
A young man	0.1%	0.0%	0.1%	0.4%	0.2%
A young man and male HHH	1.0%	0.8%	1.3%	1.4%	1.2%
A young man, a woman and male HHH	0.1%	0.0%	0.0%	0.0%	0.0%
<i>A young man is involved</i>	<i>1.5%</i>	<i>0.9%</i>	<i>1.7%</i>	<i>2.7%</i>	<i>1.8%</i>
N	2,505	1,419	1,359	1,235	6,518

Table 69 - Primary crop by gender of plot manager

	Who decides on the plot				Total
	North Borgou		Tchaourou		
	A man	A woman	A man	A woman	
<i>Main crop</i>					
Maize	39.7%	41.9%	34.9%	38.0%	38.6%
Sorghum / mil	12.2%	4.7%	6.3%	4.2%	10.4%
Soy	11.3%	24.3%	10.9%	6.3%	11.5%
Yams	8.4%	3.3%	16.2%	5.1%	10.0%
Cotton	20.1%	14.0%	0.3%	0.6%	15.0%
Cashew	2.0%	3.2%	12.8%	17.5%	4.8%
Manioc	1.6%	0.5%	9.9%	15.5%	3.8%
Other	4.7%	8.0%	8.6%	12.8%	5.9%
N	5076	196	1132	110	6517

Figure 31 - Cash crop by plot manager

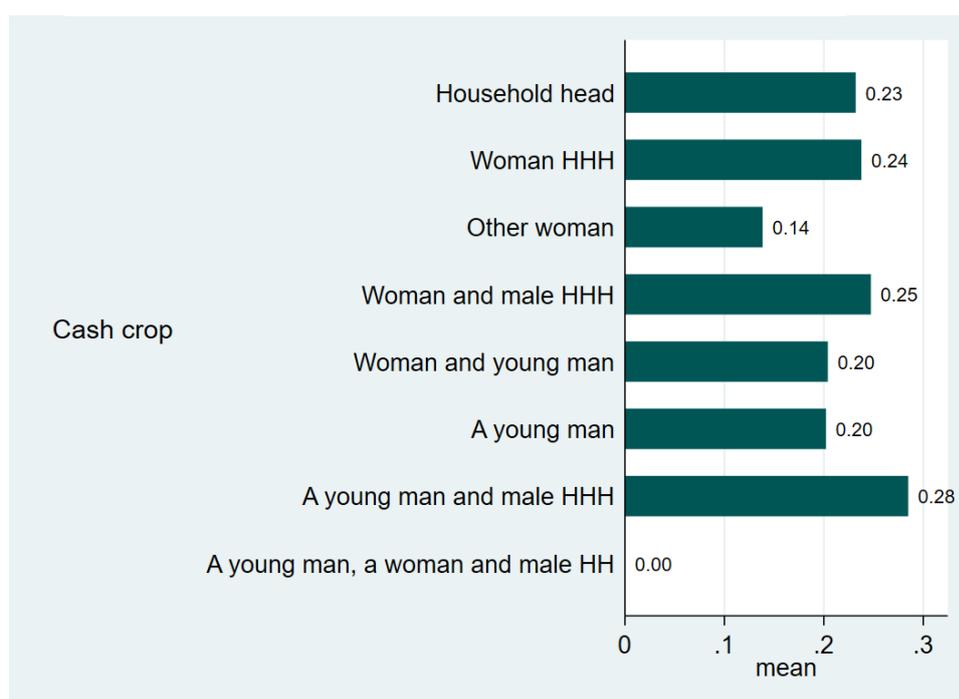


Table 70 - Primary crop by main ethnicities

	Ethnicity								Total
	North Borgou				Tchaourou				
	Bariba and rel.	Peulh and rel.	Yoruba and rel.	Other	Bariba and rel.	Peulh and rel.	Yoruba and rel.	Other	
Main crop									
Maize	40.7%	39.4%	45.8%	36.5%	35.1%	35.8%	33.1%	37.8%	38.6%
Sorghum / mil	5.2%	17.8%	4.6%	6.8%	5.5%	13.3%	4.0%	7.0%	10.4%
Soy	14.2%	9.5%	18.6%	15.5%	13.3%	9.1%	4.0%	15.2%	11.5%
Yams	8.8%	7.8%	8.6%	6.8%	20.3%	19.6%	9.1%	13.5%	10.0%
Cotton	20.8%	18.8%	19.7%	22.4%	0.4%	0.0%	0.0%	0.8%	15.0%
Cashew	2.8%	1.6%	1.3%	1.3%	7.6%	11.4%	25.9%	6.7%	4.8%
Manioc	2.5%	1.0%	0.0%	0.2%	8.7%	8.4%	19.1%	2.6%	3.8%
Other	4.9%	4.1%	1.4%	10.6%	9.2%	2.4%	4.9%	16.3%	5.8%
N	1990	2954	39	293	468	156	305	313	6518

Table 71 - Primary crop by migration status

<i>Main crop</i>	Migrant Status				Total
	North Borgou		Tchaourou		
	Non-Migrant	Migrant	Non-Migrant	Migrant	
Maize	39.9%	38.6%	34.4%	37.1%	38.6%
Sorghum / mil	12.1%	8.3%	5.9%	6.5%	10.4%
Soy	11.7%	13.7%	10.1%	11.8%	11.5%
Yams	8.3%	6.2%	15.3%	15.5%	10.0%
Cotton	19.7%	21.6%	0.1%	0.8%	15.0%
Cashew	2.1%	0.7%	15.2%	8.3%	4.8%
Manioc	1.7%	0.0%	12.7%	4.8%	3.8%
Other	4.4%	10.8%	6.3%	15.2%	5.8%
N	4983	293	865	377	6518

AGRICULTURAL INPUTS

Soil preparation techniques differ between primary crops. Here below, we focus on plots on which only one type of crop is cultivated, which represents 86% of the plots. While yams and manioc are cultivated on heaps (for more than 90% of fields on which they are the primary crop), nearly half of fields on which cotton is the primary crop are prepared with a plough. 8% of fields are prepared using a tractor and around 30% of fields of maize, sorghum/millet and soy are prepared using a plough. Of those using a plough on any field, 87% of households claim to own oxen while only 57% of the households as a whole claim to own oxen, showing there is a relationship between the ownership of oxen and plough usage on fields (which is recorded separately to tractor use). As a result, manual soil preparation remains the majority land preparation technic even when yams and manioc fields are excluded. Differences arise across the communes of Northern Borgou that cannot be solely explained by differences in cultivated crops. Notably, the percentage of fields prepared manually with mounds is lower in Kalalé while the plough is more commonly used. More than one quarter of fields (17.6%) are prepared using a tractor in Bembéréké while this percentage is lower than 5% in other communes.¹⁷ Tillage methods differ by gender of the plot manager. Even accounting for differences in primary crops, fewer plots managed by a woman are prepared using a plough while more of them were prepared manually without mounds.

Households do not typically buy seeds. Farmers bought seeds for only 11% of fields, this percentage being higher with soy as the primary crop (19.4%). Difference across primary crops are in line with differences across communes, with seeds bought on 25% of fields in Tchaourou while this percentage range from 5 to 7% in Northern Borgou. Seeds were bought on more of the plots managed by a woman (18%). On around 90% of fields farmers used seeds kept from the previous harvest. Given that seeds were purchased for so few plots, the amount spent is not so informative. Instead, we report the quantity of seeds used which has a mean of 75kg where seeds were used and 8205 seedlings where these were used (though this is distorted by some extreme values in Tchaourou). The median number of seedlings is 100 and for seeds is 25kg for the whole sample.

¹⁷ This difference is partly due to a previous AFD program that provided tractors paid off in instalments. These are then rented out by the owner to other farmers in the area.

Noteworthy is the fact that so few households use improved seeds, averaging only 1.4% of all fields and 2.7% of maize fields. Fertiliser use varies considerably across primary crops. Virtually all fields where cotton is the primary crop received fertilisers (97.5%) and the majority of maize fields (66.2%), while this is the case for the minority of yams and manioc fields (4.6% and 6.3% respectively). As a result, Tchaourou reports much lower use of fertiliser as well as lower quantities for those who do use it. This is reflected in both the mean and median expenditure on fertiliser among those who purchase it at all. Pesticides (including both herbicides and insecticides) are widely used in all communes, averaging 63% of fields in the full sample with variation across primary crops. It is less commonly used where yams and manioc are the primary crop and more on cotton and maize fields.

On average, women's plots receive fewer inputs than men's plots. If a greater percentage of women's plots led to buying seeds, the quantity of seeds used is more than four times lower than that on men's plots. Fertiliser and pesticides use are lower on plots managed by a woman.

Table 72 - Agricultural inputs by primary crop

	Primary crop						Total
	Maize	Sorghum / mil	Soy	Yams	Cotton	Manioc	
<u>How land worked</u>							
Manually with mounds	21.4%	24.2%	22.5%	92.0%	16.7%	90.5%	31.6%
Manually without mounds	35.3%	46.0%	41.5%	1.9%	20.0%	5.8%	32.6%
Plough	31.9%	27.0%	28.6%	5.7%	48.4%	3.4%	27.8%
With own tractor	2.4%	0.5%	1.0%	0.1%	3.1%	0.3%	1.6%
With a rental tractor	9.1%	2.3%	6.3%	0.3%	11.8%	0.0%	6.4%
N	2025	616	732	558	988	182	5732
Expenses for tillage (thousand FCFA)	589.9	109.8	120.7	41.19	303.5	41.91	324.2
N	2004	607	728	555	982	181	5673
Monoculture	79%	87%	94%	91%	95%	81%	86%
N	2512	695	776	602	1033	208	6518
<u>Seeds and inputs</u>							
Bought seeds	6.9%	1.9%	19.4%	6.8%	5.5%	1.6%	8.9%
Used improved seeds	2.7%	0.2%	0.8%	0.5%	1.4%	0.0%	1.4%
Used fertiliser	66.2%	16.0%	11.6%	4.6%	97.5%	6.3%	43.9%
Used pesticides	76.7%	51.4%	54.0%	30.7%	94.8%	32.0%	62.8%
Kg of seeds	45.69	20.36	22.06	1313.8	103.9	90.88	81.11
(median)	(25)	(10)	(15)	(300)	(60)	(100)	(25)
Number of seedlings	46.4	30.0	9.7	10743.9	64.1	12654.7	9382.1
(median)	(20)	(20)	(10)	(100)	(50)	(200)	(100)
Expenses for fertiliser (mean - thousand FCFA)	1053.7	538.5	31.5	27.2	768.6	57.7	863.9
(median)	(60)	(16)	(24)	(24)	(120)	(24)	(72)

Table 73 - Agricultural inputs by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<u>How land worked</u>					
Manually with mounds	23,1%	19,5%	29,9%	58,8%	33,4%
Manually without mounds	27,3%	41,3%	29,8%	37,1%	32,5%
Plough	31,2%	38,9%	36,6%	1,0%	26,3%
With own tractor	3,5%	0,1%	1,1%	0,1%	1,5%
With a rental tractor	14,9%	0,2%	2,6%	3,0%	6,3%
N	2493	1418	1365	1242	6518
Expenses for tillage (thousand FCFA)	102.5	47.91	724.2	242.6	298.9
Monoculture	89%	80%	98%	75%	86%
<u>Seeds and inputs</u>					
Bought seeds	5%	7%	7%	25%	11%
Used improved seeds	1%	4%	1%	1%	1%
Used fertiliser	54%	48%	59%	6%	43%
Used pesticides	67%	55%	70%	56%	63%
Kg of seeds	59.56	176.2	68.03	25.22	74.63
(median)	(25)	(20)	(35)	(20)	(25)
Number of seedlings	382.9	510.0	343.1	14135.5	8204.7
(median)	(60)	(100)	(50)	(200)	(100)
Expenses for fertiliser (mean - thousand FCFA)	229.6	214.2	1822.7	50.49	834.1
(median)	(72)	(48)	(84)	(27)	(70)

Table 74 - Agricultural inputs by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
How land worked												
Manually with mounds	18,3%	18,9%	27,1%	29,4%	31,2%	40,6%	20,7%	21,9%	17,0%	64,7%	51,5%	33,4%
Manually without mounds	33,2%	19,6%	37,9%	24,4%	25,8%	40,7%	54,5%	35,8%	33,7%	35,1%	39,6%	32,5%
Plough	20,1%	47,5%	32,4%	41,4%	39,6%	14,5%	24,6%	42,1%	49,0%	0,3%	1,9%	26,3%
With own tractor	4,3%	4,1%	0,9%	1,2%	1,0%	0,0%	0,0%	0,0%	0,2%	0,0%	0,2%	1,5%
With a rental tractor	24,2%	9,9%	1,6%	3,6%	2,3%	4,2%	0,2%	0,2%	0,1%	0,0%	6,8%	6,3%
N	1040	859	515	461	678	305	375	440	603	513	729	6518
Expenses for tillage (thousand FCFA)	157,7	451,2	21,29	122,4	1043,8	25,21	77,31	67,27	12,00	188,3	309,7	298,9
Monoculture	88%	91%	93%	97%	98%	92%	77%	85%	80%	68%	82%	86%
Seeds and inputs												
Bought seeds	4%	7%	6%	4%	6%	8%	5%	10%	8%	37%	10%	11%
Used improved seeds	1%	0%	1%	1%	1%	1%	2%	9%	2%	0%	2%	1%
Used fertiliser	44%	68%	65%	60%	57%	47%	44%	50%	49%	4%	9%	43%
Used pesticides	62%	71%	75%	79%	70%	59%	52%	51%	59%	43%	72%	63%
Kg of seeds	58,47	80,73	43,86	79,87	59,31	38,11	62,48	76,12	321,1	20,84	29,32	74,63
(median)	(25)	(30)	(25)	(30)	(40)	(15)	(25)	(15)	(25)	(15)	(25)	(25)
Number of seedlings	149,3	705,7	234,9	672,3	262,7	333,2	342,2	146,1	850,4	19995,0	836,9	8204,7
(median)	(40)	(100)	(67)	(200)	(50)	(100)	(300)	(80)	(50)	(300)	(100)	(100)
Expenses for fertiliser (mean - thousand FCFA)	392,4	1574,9	170,9	723,7	1628,3	85,56	328,5	305,3	73,63	34,89	58,65	834,1
(median)	(72)	(84)	(72)	(100)	(88)	(48)	(48)	(55)	(48)	(22)	(32)	(70)

Table 75 - Agricultural inputs by gender of plot manager

	Who decides on the plot		
	A man	A woman	Total
How land worked			
Manually with mounds	33,4%	33,9%	33,4%
Manually without mounds	32,2%	38,4%	32,5%
Plough	26,6%	19,7%	26,3%
With own tractor	1,5%	0,8%	1,4%
With a rental tractor	6,3%	7,2%	6,3%
N	6281	314	6595
Expenses for tillage (thousand FCFA)	300,9	263,9	299
Monoculture	86,3%	87,5%	86,3%
Seeds and inputs			
Bought seeds	10,2%	18,1%	10,6%
Used improved seeds	1,5%	1,8%	1,5%
Used fertiliser	43,2%	30,6%	42,6%
Used pesticides	63,5%	59,3%	63,3%
Kg of seeds	77,57	18,98	74,6
(median)	(25)	(10)	(25)
Number of seedlings	8630,7	1291,2	8204,7
(median)	(100)	(150)	(100)
Expenses for fertiliser (mean - thousand FCFA)	862,4	109,1	834,5
(median)	(72)	(30)	(70)

LABOUR INPUTS

Labour inputs amount for 242 people-days on average per plot, ranging from 233 for plots where soil is prepared manually to 340 where soil is prepared with a tractor. This is calculated by the number of people multiplied by the number of days for each field. On plots where soil is prepared with a tractor, fewer people-days are devoted to the soil preparation but more to the harvest. Labour inputs increase by distance to the plot, in line with more distant plots being on average larger. Labour inputs differ noticeably across clusters and are half the magnitude on plots managed by women than on plots managed by men. To account for differences in average plot sizes by gender, we compare labour inputs by gender of the plot manager for four quartiles of plot size. Total labour inputs are rather similar by gender for smaller plots, but differences increase with the plot size.

Table 76 - Labour inputs by soil preparation

	Soil preparation			Total
	Manually	Plough	With a tractor	
Per plot labour				
no. of people working on soil preparation	3.9	3.6	3.4	3.8
no. of days people worked on soil preparation	8.6	9.5	7.3	8.7
no. of people working on seeding	4.1	5.5	6.6	4.7
no. of days people worked on seeding	7.1	6.5	7.1	7.0
no. of people working in cultivation of crops	4.3	4.2	4.4	4.2
no. of days people worked in cultivation of crops	11.4	12.2	12.2	11.7
no. of people harvesting	5.5	7.0	8.0	6.1
no. of days people harvested	15.6	21.4	23.7	17.8
no. of days total	41.8	49.3	49.7	44.4
Total people days	233.2	301.8	340.9	259.6
N	4087	1856	559	6502

Table 77 - Labour inputs by plot distance

	Distance to the plot				Total
	0m-600m	600m-1700m	1700m-3400m	>3400m	
Per plot labour					
no. of people working on soil preparation	3.3	3.9	4.0	4.0	3.8
no. of days people worked on soil preparation	8.3	8.5	8.7	8.9	8.6
no. of people working on seeding	4.2	4.5	4.8	5.2	4.7
no. of days people worked on seeding	7.0	7.1	7.1	7.1	7.1
no. of people working in cultivation of crops	4.0	4.2	4.3	4.6	4.3
no. of days people worked in cultivation of crops	13.0	10.9	11.8	11.7	11.8
no. of people harvesting	5.5	6.2	6.0	6.5	6.1
no. of days people harvested	17.1	18.1	17.0	18.7	17.7
no. of days total	44.8	43.6	43.8	45.5	44.4
Total people days	227.3	255.3	266.0	288.9	260.4
N	1479	1500	1610	1610	6199

Table 78 - Labour inputs by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Labour per plot												
no. of people working on soil preparation	3.2	4.1	4.9	3.4	3.4	3.9	3.5	3.4	2.9	4.2	4.5	3.8
no. of days people worked on soil preparation	6.5	11.0	10.9	13.2	11.0	7.7	11.7	11.7	6.1	4.3	7.4	8.7
no. of people working on seeding	4.5	5.6	6.3	5.9	4.7	4.2	4.2	4.4	4.0	3.7	4.7	4.7
no. of days people worked on seeding	6.3	8.3	8.9	7.3	7.5	6.8	8.8	9.3	5.0	5.6	5.5	7.0
no. of people working in cultivation of crops	3.5	4.7	5.4	4.8	3.9	3.6	6.9	5.9	3.4	3.8	4.2	4.2
no. of days people worked in cultivation of crops	10.2	13.0	12.1	13.5	11.7	10.9	24.5	22.5	11.0	6.2	7.9	11.7
no. of people harvesting	5.4	7.2	8.0	7.0	5.9	4.7	7.0	6.8	5.2	5.0	6.6	6.1
no. of days people harvested	17.3	21.6	20.1	18.1	18.2	20.5	21.4	20.0	16.2	9.8	18.2	17.8
no. of days total	39.8	53.7	51.7	51.1	47.9	45.4	66.2	63.1	37.8	24.8	37.6	44.4
Total people days	203.1	370.9	386.4	308.7	275.5	225.0	441.5	383.1	168.0	110.2	227.0	259.6
N	1040	858	513	461	676	305	374	437	600	512	726	6502

Table 79 - Labour inputs by gender of plot manager and plot size

	Plot size								Total
	First quartile		Second quartile		Third quartile		Fourth quartile		
	A man	A woman	A man	A woman	A man	A woman	A man	A woman	
<i>Who decides on the plot</i>									
<u>Per plot labour</u>									
no. of people working on soil preparation	3.1	3.5	3.3	3.1	3.9	4.0	4.5	2.9	3.7
no. of days people worked on soil preparation	6.1	4.5	8.3	5.7	9.1	6.9	10.5	5.3	8.6
no. of people working on seeding	3.5	3.4	4.3	3.7	4.8	4.4	5.8	3.3	4.7
no. of days people worked on seeding	4.9	3.9	6.9	4.6	7.2	4.8	8.0	4.6	6.8
no. of people working in cultivation of crops	3.0	4.9	4.0	3.5	4.8	3.6	4.7	3.0	4.2
no. of days people worked in cultivation of crops	10.1	7.3	12.0	6.6	12.0	8.5	12.4	4.8	11.5
no. of people harvesting	4.5	5.7	5.5	4.4	6.7	5.1	7.2	3.8	6.1
no. of days people harvested	11.8	8.0	16.7	11.2	19.3	15.1	22.8	9.6	17.8
no. of days total	31.88	23.23	43.34	27.28	47.03	34.03	52.78	23.6	43.97
Total people days	122.5	121.8	219.1	114.9	279.3	167.1	361.6	67.3	251.5
Parcel size (hectares)	0.8	0.8	2.3	2.4	4.9	4.2	13.1	14.6	5.7
N	982	128	1625	95	1364	38	1859	21	6112

AGRICULTURAL EQUIPMENT AND LIVESTOCK

Households were asked about their agricultural assets and livestock ownership, without distinguishing by plots. Few households own expensive machinery to be used in agricultural production. Only 1.6% own a tractor and less than 1% own motorised pumps of machines for crushing, husking rice or milking. More basic equipment such as sprayers are more prevalent, as is ownership of labour animals. One noticeable item that varies by cluster is ownership of a plough, which is virtually non-existent in Tchaourou and lower in Sinendé G3 (southern Sinendé), though fairly common in the rest of Northern Borgou in our sample, in line with differences in cultivated crops between these areas. Overall, households own less agricultural equipment and livestock in Tchaourou and to a lesser extent in Sinendé G3. Differences are even starker between male headed and female headed households, the latter owning less livestock, the majority of which is made up of goats and chickens for women, and 17% of them owning any agricultural asset (against 60% of male headed households). Migrant households also own fewer agricultural assets, with less than one third of them owning any agricultural equipment and smaller differences between migrant and non-migrant households within Tchaourou,

There is a high degree of variation in the livestock owned, with many households owning zero of each type of animal while others have large numbers of certain animals. For this reason, we include the maximum number of animals in brackets. More pigs are present in Bembéréké G1 and in the commune of Tchaourou, though in the latter fewer oxen are owned. This fits with the fact that households are less likely to own a plough. Greater differences arise across ethnic groups, Peulh and related households owning more animals with particularly large differences clear in cattle. Looking at who owns livestock, women are more involved in the management of pigs, goats, sheep and ducks. Very few animals are managed by young men, with greater percentages being found in pigs, sheep and poultry rearing. Migrant households own less livestock on average but more pigs than non-migrant households.

Table 80 - Agricultural equipment and livestock by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Asset ownership (% HH)</u>												
Tractor	4.7%	4.2%	2.1%	1.7%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.6%
Cart	8.5%	11.7%	23.0%	5.5%	11.2%	6.9%	2.9%	5.2%	3.2%	0.0%	1.2%	6.5%
Plough	28.2%	45.4%	46.4%	35.3%	31.6%	13.0%	30.7%	42.6%	50.1%	0.0%	1.2%	25.4%
Grain crusher	0.6%	0.4%	0.9%	0.6%	0.0%	1.2%	2.5%	1.1%	0.0%	0.6%	0.0%	0.6%
Husker	0.6%	0.9%	0.4%	1.5%	0.2%	1.8%	0.0%	0.6%	0.3%	0.9%	0.3%	0.7%
Storehouse / Store	32.8%	55.1%	41.5%	40.5%	43.2%	31.2%	43.0%	41.9%	46.3%	18.1%	19.6%	36.1%
Motor pump	0.7%	2.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.7%	0.7%
Sprayer	28.5%	40.2%	16.7%	48.2%	39.2%	12.9%	17.9%	16.8%	18.3%	5.9%	20.2%	25.4%
Rototiller	2.6%	4.9%	2.0%	0.6%	0.6%	0.0%	0.0%	1.0%	0.6%	0.1%	0.3%	1.3%
Labour animals	36.5%	49.3%	56.1%	48.0%	40.0%	23.7%	43.4%	52.0%	52.6%	0.1%	2.1%	31.4%
Rice husker	0.0%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.2%
Milking machine	0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.2%
<i>Any agricultural asset</i>	64.5%	79.8%	73.5%	68.6%	65.1%	47.7%	61.0%	69.7%	67.9%	22.4%	32.3%	55.8%
N	334	395	224	224	336	112	224	224	224	336	335	2968
<i>Any agricultural asset (HHH works in agriculture)</i>	67.0%	88.5%	78.8%	72.1%	72.7%	54.4%	73.1%	81.6%	76.2%	32.1%	38.2%	64.4%
N	282	314	179	180	254	92	136	153	161	207	223	2181

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Impact Evaluation of ProPFR – Baseline Report

Livestock - Mean N (Max N)

Oxen	1.328 (19)	2.102 (30)	8.545 (350)	2.157 (15)	1.675 (45)	1.348 (17)	1.361 (12)	4.384 (105)	1.626 (10)	0.196 (53)	0.170 (20)	1.621 (350)
Cattle	4.388 (75)	5.744 (179)	5.870 (100)	2.787 (88)	6.342 (120)	1.516 (25)	3.612 (40)	5.000 (70)	5.773 (90)	0.516 (100)	1.887 (450)	3.695 (450)
Calves	2.194 (62)	2.393 (63)	2.755 (40)	0.703 (12)	2.330 (100)	0.454 (15)	1.341 (25)	1.802 (30)	2.619 (56)	0.135 (12)	0.503 (23)	1.434 (100)
Bulls	0.470 (10)	1.932 (108)	2.411 (54)	0.271 (8)	1.491 (90)	0.428 (17)	1.762 (35)	2.157 (50)	1.225 (30)	0.125 (20)	0.113 (16)	0.969 (108)
Goats	5.730 (84)	2.853 (68)	4.419 (50)	2.445 (30)	3.519 (30)	5.194 (100)	3.016 (28)	3.783 (60)	5.392 (60)	2.716 (45)	3.142 (58)	3.580 (100)
Sheep	4.087 (75)	4.631 (57)	5.962 (45)	3.860 (40)	5.532 (80)	2.883 (60)	3.530 (60)	5.859 (60)	6.378 (50)	1.569 (100)	4.470 (70)	4.086 (100)
Horses	0.0133 (1)	0 (0)	0 (0)	0 (0)	0.00305 (1)	0 (0)	0 (0)	0.00440 (1)	0.0192 (1)	0 (0)	0.450 (20)	0.0503 (20)
Chicken	14.12 (100)	10.15 (200)	16.25 (150)	9.772 (80)	8.645 (100)	11.12 (100)	8.534 (60)	10.54 (150)	12.74 (150)	4.981 (127)	15.44 (200)	10.25 (200)
Ducks	0.497 (40)	0.112 (12)	0.522 (40)	0.0246 (3)	0.0900 (13)	0.435 (20)	0.346 (10)	0.452 (22)	0.648 (16)	0.292 (30)	0.513 (36)	0.302 (40)
Guinea Fowl	5.970 (60)	3.448 (80)	4.779 (100)	2.377 (60)	2.776 (35)	3.146 (40)	2.028 (30)	3.240 (50)	2.365 (40)	0.485 (70)	3.155 (90)	2.827 (100)
Donkeys	0.00598 (3)	0 (0)	0.0162 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.00108 (3)
Pigs	1.116 (30)	0.100 (30)	0.0484 (10)	0.359 (20)	0.427 (25)	0.935 (40)	0.0619 (7)	0.181 (20)	0.118 (15)	1.044 (80)	0.930 (48)	0.573 (80)
N	334	395	224	224	336	112	224	224	224	336	335	2968

Table 81 - Livestock owner

	Livestock										
	Oxen	Cattle	Calves	Bulls	Goats	Sheep	Horses	Chicken	Ducks	Guinea Fowl	Pigs
Who owns livestock?											
Household head	91.1%	83.4%	83.7%	89.2%	58.1%	69.9%	94.6%	59.9%	73.2%	78.6%	56.3%
Woman HHH	2.3%	2.0%	1.4%	1.5%	6.4%	3.6%		6.5%	4.5%	2.7%	5.5%
Other woman	0.4%	1.4%	1.7%	0.3%	13.9%	8.4%	3.9%	9.3%	11.2%	5.2%	19.5%
Woman and male HHH	4.7%	11.7%	11.8%	7.0%	19.1%	14.7%	1.5%	20.7%	7.7%	8.9%	13.9%
Woman and a young man	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%	0.0%
<i>A woman is one of the owners</i>	<i>7.4%</i>	<i>15.1%</i>	<i>14.9%</i>	<i>8.8%</i>	<i>39.4%</i>	<i>26.7%</i>	<i>5.4%</i>	<i>36.6%</i>	<i>23.4%</i>	<i>17.1%</i>	<i>38.9%</i>
A young man	0.3%	0.4%	0.4%	0.6%	1.2%	1.5%	0.0%	1.9%	2.5%	2.4%	0.6%
A young man and male HHH	1.1%	1.1%	1.0%	1.4%	1.3%	2.0%	0.0%	1.7%	0.9%	1.9%	4.2%
<i>A young man is one of the owners</i>	<i>1.4%</i>	<i>1.5%</i>	<i>1.4%</i>	<i>2.0%</i>	<i>2.5%</i>	<i>3.5%</i>	<i>0.0%</i>	<i>3.7%</i>	<i>3.4%</i>	<i>4.6%</i>	<i>4.8%</i>
N	1028	831	679	526	1105	1090	31	1552	131	723	122

Table 82 - Agricultural equipment and livestock by gender

	HH head gender		
	Male	Female	Total
<u>Asset ownership (% HH)</u>			
Tractor	1.7%	0.0%	1.6%
Cart	7.2%	0.6%	6.5%
Plough	27.9%	3.8%	25.4%
Grain crusher	0.7%	0.0%	0.6%
Husker	0.8%	0.0%	0.7%
Storehouse / Store	39.0%	11.2%	36.1%
Motor pump	0.8%	0.2%	0.7%
Sprayer	27.7%	6.3%	25.4%
Rototiller	1.4%	0.0%	1.3%
Labour animals	34.5%	5.5%	31.4%
Rice husker	0.2%	0.2%	0.2%
Milking machine	0.2%	0.2%	0.2%
<i>Any agricultural asset</i>	60.3%	16.8%	55.8%
N	2673	295	2968
<i>Any agricultural asset (HHH works in agriculture)</i>	66.4%	26.3%	64.4%
N	2077	104	2181
<u>Livestock - Mean N (Max N)</u>			
Oxen	1.8 (350)	0.3 (17)	1.6 (350)
Cattle	4.1 (450)	0.4 (52)	3.7 (450)
Calves	1.6 (100)	0.2 (20)	1.4 (100)
Bulls	1.1 (108)	0.2 (20)	1.0 (108)
Goats	3.8 (100)	1.7 (40)	3.6 (100)
Sheep	4.5 (100)	0.9 (32)	4.1 (100)
Horses	0.1 (20)	0 (0)	0.1 (20)
Chicken	10.9 (200)	4.3 (100)	10.3 (200)
Ducks	0.3 (40)	0.1 (7)	0.3 (40)
Guinea Fowl	3.1 (100)	0.6 (90)	2.8 (100)
Donkeys	0.0 (3)	0 (0)	0.0 (3)
Pigs	0.6 (80)	0.3 (25)	0.6 (80)
N	2673	295	2968

Table 83 - Agricultural equipment and livestock by migration status

	Migrant Status				Total
	North Borgou		Tchaourou		
	Non-Migrant	Migrant	Non-Migrant	Migrant	
<u>Asset ownership (% HH)</u>					
Tractor	2.3%	0.5%	0.1%	0.0%	1.6%
Cart	10.6%	0.5%	0.7%	0.2%	7.4%
Plough	40.0%	4.8%	0.8%	0.0%	27.7%
Grain crusher	0.6%	0.9%	0.3%	0.2%	0.5%
Husker	0.9%	0.2%	1.1%	0.2%	0.9%
Storehouse / Store	45.0%	24.1%	20.2%	18.3%	37.2%
Motor pump	0.8%	0.0%	1.1%	0.9%	0.8%
Sprayer	35.5%	23.3%	14.3%	14.5%	29.3%
Rototiller	2.3%	0.0%	0.1%	0.2%	1.6%
Labour animals	49.9%	8.7%	0.9%	0.4%	34.7%
Rice husker	0.2%	0.0%	0.2%	0.0%	0.2%
Milking machine	0.2%	0.0%	0.1%	0.1%	0.1%
<i>Any agricultural asset</i>	72.8%	41.4%	29.3%	27.1%	59.5%
N	3655	276	744	363	5038
<i>Any agricultural asset (HHH works in agriculture)</i>	76.1%	49.6%	34.1%	33.4%	64.6%
N	3035	169	553	254	4011
<u>Livestock - Mean N (Max N)</u>					
Oxen	2.437 (350)	0.320 (9)	0.126 (53)	0.244 (40)	1.723 (350)
Cattle	5.324 (179)	0.359 (55)	1.684 (450)	0.844 (42)	4.023 (450)
Calves	2.105 (100)	0.134 (20)	0.294 (23)	0.373 (15)	1.527 (100)
Bulls	1.316 (108)	0.167 (25)	0.136 (20)	0.0808 (10)	0.938 (108)
Goats	4.567 (100)	2.097 (25)	2.883 (50)	4.616 (58)	4.132 (100)
Sheep	5.242 (80)	1.115 (25)	3.428 (100)	3.070 (70)	4.508 (100)
Horses	0.00580 (1)	0 (0)	0.103 (10)	0.359 (20)	0.0523 (20)
Chicken	12.58 (200)	8.394 (60)	11.07 (200)	12.06 (134)	12.03 (200)
Ducks	0.321 (40)	0.0979 (12)	0.221 (36)	0.530 (18)	0.308 (40)
Guinea Fowl	3.695 (100)	3.800 (45)	1.810 (70)	2.163 (90)	3.235 (100)
Donkeys	0.00209 (3)	0 (0)	0 (0)	0 (0)	0.00142 (3)
Pigs	0.371 (40)	1.977 (25)	0.611 (80)	1.990 (48)	0.637 (80)
N	3655	276	744	363	5038

Table 84 - Agricultural equipment and livestock by ethnicity

	Ethnicity				Total
	Bariba and related	Peulh and related	Yoruba and related	Other	
Livestock - Mean N (Max N)					
Oxen	1.860 (350)	2.185 (120)	0.0840 (7)	0.246 (11)	1.621 (350)
Cattle	0.999 (56)	7.868 (450)	0.126 (52)	0.329 (60)	3.695 (450)
Calves	0.495 (26)	2.968 (100)	0.0205 (12)	0.133 (10)	1.434 (100)
Bulls	0.340 (50)	1.977 (108)	0.0836 (20)	0.117 (11)	0.969 (108)
Goats	3.773 (60)	4.009 (100)	2.060 (37)	2.804 (60)	3.580 (100)
Sheep	2.373 (60)	6.775 (100)	1.070 (37)	2.449 (70)	4.086 (100)
Horses	0.0244 (5)	0.0320 (20)	0.0202 (10)	0.220 (20)	0.0503 (20)
Chicken	10.32 (200)	11.90 (200)	3.361 (100)	10.15 (134)	10.25 (200)
Ducks	0.386 (36)	0.201 (40)	0.212 (15)	0.477 (40)	0.302 (40)
Guinea Fowl	2.559 (80)	3.609 (100)	0.264 (52)	3.125 (90)	2.827 (100)
Donkeys	0.00151 (3)	0.00128 (2)	0 (0)	0 (0)	0.00108 (3)
Pigs	0.453 (40)	0.0439 (20)	1.326 (80)	2.138 (48)	0.573 (80)
N	1007	1389	238	332	2966

INVESTMENTS IN AGRICULTURAL PLOTS

We also consider investment in the agricultural plots by cluster and in total. Currently only 1% of plots owned are being fallowed, though 10% claim to have ever fallowed a plot, with important variations across clusters. The levels across Bembéréké are relatively similar between clusters and close to the average for our sample as a whole, while in Sinendé cluster 6 there seems to be a much higher level of fallowing as is also the case in cluster 9 in Kalalé (G3) and cluster 11 in Tchaourou (G2). 22% have built infrastructure on the plot, with higher proportions of plots with infrastructure in Bembéréké, Sinendé and Tchaourou G2. Of those with infrastructure, those in Sinendé seem to have invested least within the last year. Very few respondents claimed to have improved access to water (2%), this percentage being particularly high in Sinendé G2. Investment in soil and water supply conservation is higher, ranging from 23%-56% across the clusters. Trees were planted on an average of 16% of plots, with lower values in Bembéréké G1 and G3, and Tchaourou G2.

There are fewer investments on plots managed by a woman or by migrant households. However, the level of investment in trees as well as in soil and water conservation remains fairly high even among these groups.

Table 85 - Investments in agricultural plots by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Currently Fallow	1.9%	0	2.8%	0	0	2.3%	0.3%	0.7%	2.9%	0.1%	0.6%	0.8%
Plot ever fallowed	10.2%	6.3%	14.6%	0.5%	5.1%	20.5%	4.8%	9.7%	16.9%	10.5%	18.7%	10.1%
Infrastructure on plot Improvements to this infrastructure	27.3%	25.8%	26.3%	33.0%	41.6%	43.2%	8.0%	7.8%	6.1%	5.0%	23.3%	23.1%
Improved access to water	12.8%	28.9%	17.8%	5.0%	7.9%	9.2%	14.5%	48.9%	15.0%	17.4%	22.2%	15.3%
Soil and water conservation	0.7%	1.4%	1.6%	1.9%	8.6%	1.4%	0.3%	0.5%	0.2%	3.4%	1.4%	2.4%
Tree planting	22.5%	55.5%	50.0%	22.3%	29.1%	49.4%	40.7%	52.0%	56.0%	43.7%	20.5%	38.8%
	10.2%	17.5%	14.0%	18.2%	21.4%	18.5%	18.7%	19.9%	22.4%	20.8%	14.7%	17.7%
Plot rental												
Ever rented the entire plot	0.6%	0.4%	0.0%	0.5%	0.6%	1.4%	1.0%	0.2%	0.9%	0.0%	1.3%	0.6%
Ever renter part of the plot	2.0%	5.5%	2.4%	3.6%	3.8%	10.8%	1.2%	3.9%	7.3%	3.6%	4.1%	4.4%
No rental	97.4%	94.1%	97.6%	95.9%	95.6%	87.8%	97.8%	95.9%	91.8%	96.4%	94.6%	94.9%

Table 86 - Investments in agricultural plots by gender of plot manager

	Who decides on the plot		Total
	A man	A woman	
Currently Fallow	0.8%	0.5%	0.8%
Plot ever fallowed	10.3%	7.36%	10.1%
Borders			
None	85.3%	82.3%	85.2%
Plant trees	13.6%	17.0%	13.8%
Corner stones	0.6%	0.5%	0.6%
Enclosure	0.4%	0.2%	0.4%
Infrastructure on plot	23.7%	12.6%	23.1%
Improvements to this infrastructure	15.6%	4.29%	15.3%
Improved access to water	2.37%	2.34%	2.37%
Soil and water conservation	39.1%	34.1%	38.8%
Tree planting	17.9%	15.2%	17.7%
Plot rental			
Ever rented the entire plot	0.6%	1.3%	0.7%
Ever renter part of the plot	3.5%	1.4%	3.3%
No rental	95.9%	97.3%	96.0%

Table 87 - Investments in agricultural plots by migration status

	Migrant Status		Total
	Non-Migrant	Migrant	
Currently Fallow	0.8%	0.6%	0.8%
Plot ever fallowed	10.1%	10.7%	10.1%
Infrastructure on plot	23.4%	20.2%	23.1%
Improvements to this infrastructure	15.4%	13.8%	15.3%
Improved access to water	2.2%	4.1%	2.4%
Soil and water conservation	40.3%	27.0%	38.8%
Tree planting	18.1%	15.2%	17.7%
Plot rental			
Ever rented the entire plot	0.6%	1.0%	0.6%
Ever renter part of the plot	4.7%	2.6%	4.4%
No rental	94.7%	96.4%	94.9%

IMPACTS

In this section we do not measure impacts as such, but rather the variables which will be used to measure the impacts in the theory of change. These variables measure what amount to the main aims of the ProPFR programme in the long term. Here we can only show what the current state of affairs is and not what the impacts of the programme are.

5.7 AGRICULTURAL PRODUCTION

Agricultural outputs are measured in several ways. Respondents were asked about the quantity of primary and secondary crops produced on each field during the last harvest. The survey took place during the beginning of the lean season, in May and June 2018. We present the reported agricultural production by main primary crops. The average production per maize field amounts for 4.06 tonnes, 1.31 tonnes per sorghum/millet field, 1.51 tonnes per soy field, 1.82 per yams field, 4.82 tonnes per cotton field, 0.96 tonnes per cashew field and 1.52 tonnes per manioc field.

To be able to compare agricultural output across different crops, the value of the harvest has been estimated using median prices at the village level.¹⁸ These values differ greatly by type of crops, ranging from an average of 150 thousand FCFA for sorghum/millet fields to 90,638 thousand FCFA for cotton fields. Among our respondents, maize fields represent the most lucrative secondary crop (160 thousand FCFA per field), followed by manioc fields (26 thousand FCFA). Households' harvest per plot is worth on average 12,362 thousand FCFA.

On average, 62% of the primary crop harvest is sold, with important variations by cultivated crops. Virtually the whole harvest of cotton and cashew and around 90% of the harvest of soy are sold, while yams and sorghum/millet are primarily consumed by the household. A greater percentage of secondary crop harvests is attributed to household consumption. Crop losses represent less than 1% of the harvest. The level of consumption in Kalalé is slightly higher than elsewhere.

As a measure of agricultural productivity, we computed the average harvest value per hectare at the plot level, equal to 2,105 thousand FCFA per hectare among our respondents. Important disparities arise across communes and clusters, value per hectare ranging from 5,261 thousand FCFA in Sinendé to 176 thousand FCFA in Tchaourou. It is important to note that caution should be taken in interpreting these results as evidence of differences in productivity. Indeed, these calculations are based on reported values of harvest and of plot size which may both suffer from measurement errors. Additionally, we have no information on whether the proportion of the plot that is currently cultivated. With these caveats in mind, we observe that value per hectare on men's plots is on average 1.66 times higher than on women's plots, and that on non-migrant households' plots 1.22 times than on migrant households' plots. Interestingly, it is in Sinendé and Tchaourou that women are most involved in plot management (see [Table 68](#)) suggesting that the geographical disparities are not driven by the gender of plot managers.

¹⁸ Average crop prices of the main crops produced in the village have been reported in the community survey. Additionally, households were asked to estimate the value of their harvest. When prices are missing at the village level, the median value of these reports has been used.

Table 88 - Agricultural output by primary and secondary crops

	Primary crop								Total
	Maize	Sorghum / mil	Soy	Yams	Cotton	Cashew	Manioc	Other	
Primary crop									
Observations	2500	679	774	552	1024	307	190	364	6390
Production (100 kg)	40,6	13,1	15,1	18,2	48,2	9,6	15,2	9,2	29,6
Estimated harvest value (thousand FCFA)	525,3	150,4	296,9	393,7	90638,2	547,9	151,7	115,4	10444,6
<i>Share of the harvest</i>									
Sales	53,4%	25,8%	89,9%	31,6%	99,3%	98,2%	49,5%	61,6%	62,2%
Household consumption	30,3%	46,0%	2,0%	58,8%	0,4%	0,2%	34,6%	26,1%	25,2%
Storage	15,8%	27,7%	7,5%	9,4%	0,2%	1,4%	15,5%	11,7%	12,1%
Lost	0,5%	0,5%	0,6%	0,2%	0,2%	0,2%	0,4%	0,7%	0,5%
Secondary crop									
Observations	464	77	44	43	44	12	26	41	751
Production (100 kg)	12,6	6,6	9,9	8,6	36,6	3,5	9,2	5,1	8,9
Estimated harvest value (thousand FCFA)	169,1	75,6	161,3	1237,0	15505,7	172,3	80,1	60,7	535,6
<i>Share of the harvest</i>									
Sales	35,8%	20,4%	86,4%	26,4%	100,0%	96,8%	39,6%	55,4%	43,0%
Household consumption	40,4%	55,5%	7,6%	67,3%	0,0%	1,5%	43,3%	35,2%	40,9%
Storage	23,8%	23,5%	6,0%	5,6%	0,0%	1,7%	16,0%	9,0%	15,7%
Lost	0,0%	0,6%	0,1%	0,7%	0,0%	0,0%	1,1%	0,4%	0,4%

Table 89 - Agricultural output by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<u>Maize fields</u>					
Estimated harvest value thousands of FCFA	738.8	221.6	706.9	162.3	525.3
Production 100 kg	57.9	15.5	55.6	11.4	40.6
N	1024	509	549	418	2500
<u>Sorghum/millet fields</u>					
Estimated harvest value thousands of FCFA	175.3	133.3	153.4	90.2	150.4
Production 100 kg	15.8	10.7	13.9	6.7	13.1
N	318	145	140	76	679
<u>Soy fields</u>					
Estimated harvest value thousands of FCFA	407.5	177.1	292.7	221.9	296.9
Production 100 kg	19.9	12.8	13.4	11.4	15.1
N	302	189	146	137	774
<u>Manioc fields</u>					
Estimated harvest value thousands of FCFA	119.1	0.4	90.0	176.3	151.7
Production 100 kg	18.9	21.2	15.6	14.1	15.2
N	40	6	15	129	190
<u>Yams fields</u>					
Estimated harvest value thousands of FCFA	886.4	263.6	310.1	173.4	393.7
Production 100 kg	27.2	25.9	19.6	8.8	18.2
N	178	135	69	170	552
<u>Cotton fields</u>					
Estimated harvest value thousands of FCFA	56440.5	16117.8	133119.9	-	90638.2
Production 100 kg	52.7	27.1	53.8	58.7	48.2
N	428	282	307	7	1024
<u>All fields</u>					
Estimated harvest value thousands of FCFA	12361.8	1580.9	39412.4	298.3	14065.8
Value per hectare	2153.3	609.0	5261.0	176.4	2104.8
N (plots)	1469	923	669	677	3738

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Table 90 - Agricultural output by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Maize fields</u>												
Estimated harvest value thousands of FCFA	969.0	672.0	798.2	834.8	663.5	578.1	239.1	212.5	224.5	117.1	230.9	600.1
Production 100 kg	69.73	53.03	61.05	68.67	49.61	39.15	14.47	16.09	16.17	7.718	15.51	40.64
N	414	378	219	196	266	100	142	163	204	152	266	2500
<u>Sorghum/millet fields</u>												
Estimated harvest value thousands of FCFA	248.2	186.4	26.65	0.263	224.2	89.83	190.1	61.32	149.9	69.08	113.4	153.0
Production 100 kg	17.23	15.36	16.86	14.33	14.78	9.521	11.17	9.934	10.95	4.079	8.179	13.14
N	119	121	58	50	79	31	34	51	60	14	62	679
<u>Soy fields</u>												
Estimated harvest value thousands of FCFA	452.4	199.3	457.4	185.7	319.6	359.7	169.8	212.0	167.5	88.66	281.4	301.2
Production 100 kg	23.40	10.02	21.53	11.75	13.98	15.78	14.88	12.90	10.09	6.754	13.48	15.05
N	158	39	67	45	68	71	69	57	63	22	115	774
<u>Manioc fields</u>												
Estimated harvest value thousands of FCFA	133.4	77.88	280.1	0.0185	100.8	81.72	0.467	0.150	0.175	128.8	168.1	123.9
Production 100 kg	18.66	10.60	54.16	3	8.648	18.55	22.79	10	15	15.27	8.315	15.20
N	22	10	7	1	5	10	4	1	1	97	32	190
<u>Yams fields</u>												
Estimated harvest value thousands of FCFA	953.4	1062.3	181.9	348.7	349.5	192.6	238.2	635.1	15.86	182.5	186.3	406.3
Production 100 kg	26.78	28.08	34.97	17.86	21.00	18.16	29.69	17.80	25.36	8.669	8.976	18.22
N	110	41	22	15	37	22	42	29	64	53	117	552
<u>Cotton fields</u>												
Estimated harvest value thousands of FCFA	79681.8	115263.6	.	142090	97120.8	33332.2	93141.2	446.4	239.8	.	.	92902.3
Production 100 kg	48.13	78.48	41.54	44.44	37.17	41.90	28.89	28.63	25.34	.	58.68	48.17
N	125	213	97	114	142	44	60	85	137	0	7	1024
<u>All fields</u>												
Estimated harvest value thousands of FCFA	10240.6	39990.1	651.1	31103.9	29556.0	9380.2	3962.0	276.1	225.9	253.0	374.0	14065.8
Value per hectare	1616.3	4816.3	133.4	3411.0	5744.6	1386.3	1472.7	166.6	119.8	185.7	162.6	2104.8
N (plots)	600	521	299	225	341	152	255	301	367	288	389	3738

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	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<u>Maize fields</u>												
Estimated harvest value (TFCFA)	904.5	662.0	786.1	819.9	651.1	527.2	211.3	213.3	237.1	129.7	199.4	525.3
Production (100 kg)	69.7	53.0	61.1	68.7	49.6	39.2	14.5	16.1	16.2	7.7	15.5	40.6
Yields (kg/ha)	2258.5	2401.6	2433.5	2207.9	2156.2	1339.4	1192.0	1102.3	1016.1	575.2	1024.1	1682.1
<u>Sorghum/millet fields</u>												
Estimated harvest value (TFCFA)	231.7	194.9	24.5	0.3	228.4	74.3	177.5	57.6	154.5	70.9	101.1	150.4
Production (100 kg)	17.2	15.4	16.9	14.3	14.8	9.5	11.2	9.9	11.0	4.1	8.2	13.1
Yields (kg/ha)	848.8	849.9	827.4	1263.2	1255.8	301.0	1095.5	984.3	744.4	386.7	648.3	854.6
<u>Soy fields</u>												
Estimated harvest value (TFCFA)	445.2	199.3	456.0	232.5	317.5	361.6	170.8	211.9	160.0	100.9	275.3	296.9
Production (100 kg)	23.4	10.0	21.5	11.8	14.0	15.8	14.9	12.9	10.1	6.8	13.5	15.1
Yields (kg/ha)	840.4	541.6	688.7	556.1	685.6	610.1	1045.8	892.6	602.7	627.6	819.7	724.4
<u>Manioc fields</u>												
Estimated harvest value (TFCFA)	133.4	82.3	280.1	0.0	100.8	81.7	0.4	0.2	0.2	180.5	156.0	151.7
Production (100 kg)	18.7	10.6	54.2	3	8.6	18.6	22.8	10	15	15.3	8.3	15.2
Yields (kg/ha)	944.0	805.1	2192.7	240.0	439.5	488.4	2255.0	400	1000	1293.9	475.8	975.9
<u>Yams fields</u>												
Estimated harvest value (TFCFA)	944.6	1037.8	181.9	348.7	349.5	192.6	389.2	600.1	13.8	159.7	189.2	393.7
Production (100 kg)	26.8	28.1	35.0	17.9	21.0	18.2	29.7	17.8	25.4	8.7	9.0	18.2
Yields (kg/ha)	1036.1	1766.8	1338.0	666.4	1068.5	608.5	2207.2	2055.0	1551.4	1118.2	456.8	1086.4
<u>Cotton fields</u>												
Estimated harvest value (TFCFA)	75681.5	112493.0	-	142090	97759.6	32150.8	93141.2	446.4	220.1	-	-	90638.2
Production (100 kg)	48.1	78.5	41.5	44.4	37.2	41.9	28.9	28.6	25.3	-	58.7	48.2
Yields (kg/ha)	1387.6	2871.9	1422.3	1367.7	1291.6	1208.9	2838.7	2848.7	1627.4	-	2461.6	1855.8

Table 91 - Agricultural output by gender of the plot manager

	Who decides on the plot		Total
	A man	A woman	
<u>Maize fields</u>			
Estimated harvest value TFCFA	541.8	235.6	525.2
Production 100 kg	41.9	18.3	40.6
N	2384	115	2499
<u>Sorghum/millet fields</u>			
Estimated harvest value TFCFA	149.2	201.6	150.4
Production 100 kg	13.1	14.3	13.1
N	664	15	679
<u>Soy fields</u>			
Estimated harvest value TFCFA	303.7	207.4	296.9
Production 100 kg	15.5	10.3	15.1
N	719	55	774
<u>Manioc fields</u>			
Estimated harvest value TFCFA	158.4	84.7	151.7
Production 100 kg	15.6	10.9	15.2
N	168	22	190
<u>Yams fields</u>			
Estimated harvest value TFCFA	369.0	1588.0	393.7
Production 100 kg	18.3	12.7	18.2
N	541	11	552
<u>Cotton fields</u>			
Estimated harvest value TFCFA	92085.5	43669.7	90638.2
Production 100 kg	48.9	25.0	48.2
N	1001	23	1024
<u>All fields</u>			
Estimated harvest value thousands of FCFA	16114.4	4204.0	15451.6
Value per hectare	2152.8	1299.7	2105.6
N (plots)	3554	183	3737

Table 92 - Agricultural output by migration status

	Migrant Status		Total
	Non-Migrant	Migrant	
<u>Maize fields</u>			
Estimated harvest value thousands of FCFA	629.2	346.5	600.1
Production 100 kg	42.97	22.92	40.64
N	2234	266	2500
<u>Sorghum/millet fields</u>			
Estimated harvest value thousands of FCFA	161.2	56.18	153.0
Production 100 kg	13.81	5.958	13.14
N	627	52	679
<u>Soy fields</u>			
Estimated harvest value thousands of FCFA	314.6	213.5	301.2
Production 100 kg	15.60	11.33	15.05
N	687	87	774
<u>Manioc fields</u>			
Estimated harvest value thousands of FCFA	120.3	160.7	123.9
Production 100 kg	15.24	14.78	15.20
N	173	17	190
<u>Yams fields</u>			
Estimated harvest value thousands of FCFA	440.3	192.2	406.3
Production 100 kg	19.62	10.08	18.22
N	481	71	552
<u>Cotton fields</u>			
Estimated harvest value thousands of FCFA	93216.2	88545.1	92902.3
Production 100 kg	48.72	40.76	48.17
N	962	62	1024
<u>All fields</u>			
Estimated harvest value thousands of FCFA	15133.9	6914.8	14065.8
Value per hectare	2150.5	1758.9	2104.8
N (plots)	3355	383	3738

5.8 FOOD SECURITY

If the ProPFR is successful in enabling households to increase their food production, the level of their food security should improve. At baseline 13% of the sampled households worried about lacking food in the past 7 days before the interview. Households were interviewed during the lean season, between May and June 2018. On average, the households report less than one day in a week in which they must respond to a lack of food/income in their consumption behaviour. This average is skewed by a large number of zeroes; thus we also create a dummy variable equal to one if a household

experiences the problem on at least one day. Here we see that around 20% of households are having to cope with shortage by depending on less preferred/cheaper food.

Only 11.6% of households must reduce portion size or eat fewer meals. This is reflected in the average number of meals per day, which is close to 3 for adults and over 4 for children under 5. There does not appear to be a particular food shortage at the time of interviewing nor is there any clear variation between the communes. Nevertheless, 36% of households have used at least one of the coping strategies listed under “*At least 1 day*” due to a lack of food, a figure which is slightly higher in Tchaourou at 38%. Considering food insecurity over the last year by cluster, this is particularly low in Bembéréké G3 (less than 5% of households) while Kalalé G3, Sinendé G3 and Tchaourou G1 appear more vulnerable with almost 20% of households reporting having been food insecure.

Female headed households appear particularly at risk with a percentage of households stating to have lacked food more than two times greater than in male headed households (24% against 12%). Migrant households are also on average more food insecure, though at a lesser extent and the difference is insignificant (16% against 14% in non-migrant households). Food shortage slightly decreases with household wealth, but the use of food coping strategies does not systematically decrease with greater wealth. As our measure of wealth is based on durable goods and dwelling characteristics, it may differ from current economic vulnerability. In this line, average number of meals per day are very similar across wealth quartiles.

Table 93 - Food security by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
N	951	672	674	671	2968
Over the last 7 days					
Worry about lacking food	10.9%	10.4%	10.6%	18.9%	13%
At least 1 day					
Depend on less preferred/cheaper food	20.6%	19.6%	19.4%	25.8%	21.5%
Ate smaller portions	13.6%	7.88%	12.8%	10.2%	11.6%
Ate fewer meals	12.2%	9.99%	12.9%	11%	11.7%
Adults restricted food consumption	12.7%	6.67%	13.1%	7.11%	10.4%
Borrowed food or depended on others to eat	8.06%	5.31%	8.65%	8%	7.8%
Not enough to eat (past 12 months)	9.45%	16.7%	14.7%	16.2%	14%
Number of days (mean)					
Depend on less preferred/cheaper food	0.465	0.458	0.450	0.940	0.592
Ate smaller portions	0.313	0.139	0.283	0.250	0.260
Ate fewer meals	0.275	0.191	0.308	0.287	0.276
Adults restricted food consumption	0.217	0.147	0.301	0.157	0.214
Borrowed food or depended on others to eat	0.159	0.102	0.160	0.195	0.161
Meals per day					
Adults	2.913	2.654	2.845	2.822	2.829
Children under 5	4.184	4.129	4.030	3.917	4.064

Table 94 - Food security by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
N	334	395	224	224	336	112	224	224	224	336	335	2968
Over the last 7 days												
Worry about lacking food	16.9%	8.42%	7.77%	4.69%	10.2%	17.0%	9.3%	15.5%	7.46%	23.8%	10.8%	13%
At least 1 day												
Depend on less preferred/cheaper food	21.6%	15.3%	25.4%	13.4%	19.6%	33%	12.5%	20.6%	25.1%	24.4%	28.1%	21.5%
Ate smaller portions	19.6%	11.9%	7.85%	3.45%	14.2%	18.8%	7.55%	13.6%	5.54%	12.6%	6.45%	11.6%
Ate fewer meals	18.1%	10.9%	6.24%	3.92%	14.6%	17%	7.81%	12.2%	5.99%	12%	9.3%	11.7%
Adults restricted food consumption	18.5%	10.4%	5.84%	5.36%	15.8%	15.7%	6.98%	12.7%	5.97%	8.95%	4.99%	10.4%
Borrowed food or depended on others to eat	11.6%	7.89%	3.79%	1.87%	8.58%	13.9%	5.36%	8.06%	4.26%	9.17%	6.08%	7.8%
Not enough to eat (past 12 months)	12.5%	11.2%	4.45%	9.38%	13.6%	17.6%	14.1%	15.8%	20.6%	17.8%	13.8%	14%
Number of days (mean)												
Depend on less preferred/cheaper food	0.476	0.356	0.525	0.326	0.498	0.666	0.267	0.561	0.612	0.883	1.032	0.592
Ate smaller portions	0.435	0.262	0.245	0.0801	0.327	0.394	0.131	0.191	0.106	0.301	0.168	0.260
Ate fewer meals	0.373	0.281	0.165	0.0791	0.361	0.364	0.110	0.419	0.103	0.322	0.229	0.276
Adults restricted food consumption	0.366	0.126	0.136	0.111	0.397	0.302	0.154	0.188	0.102	0.207	0.100	0.214
Borrowed food or depended on others to eat	0.224	0.133	0.0871	0.0777	0.166	0.242	0.0992	0.123	0.0860	0.227	0.142	0.161
Meals per day												
Adults	2.808	2.970	2.731	2.966	2.871	2.761	2.677	2.549	2.715	2.750	2.941	2.829
Children under 5	4.122	4.163	4.061	4.228	3.969	4.168	4.095	3.929	4.337	3.518	4.377	4.064

Table 95 - Food security by gender of HH head

	HH head gender		Total
	Male	Female	
N	2383	295	2678
Over the last 7 days			
Worry about lacking food	11.7%	23.8%	13%
At least 1 day			
Depend on less preferred/cheaper food	20%	34.3%	21.5%
Ate smaller portions	10.3%	22.8%	11.6%
Ate fewer meals	10.6%	21.1%	11.7%
Adults restricted food consumption	9.73%	17.9%	10.4%
Borrowed food or depended on others to eat	7%	14.7%	7.8%
Not enough to eat (past 12 months)	12.8%	23.9%	14%
Number of days (mean)			
Depend on less preferred/cheaper food	0.541	1.036	0.592
Ate smaller portions	0.214	0.660	0.260
Ate fewer meals	0.244	0.551	0.276
Adults restricted food consumption	0.197	0.422	0.214
Borrowed food or depended on others to eat	0.140	0.343	0.161
Meals per day			
Adults	2.837	2.753	2.829
Children under 5	4.099	3.640	4.064

Table 96 - Food security by migration status

	Migrant status		Total
	Non-Migrant	Migrant	
N	2561	407	2968
Over the last 7 days			
Worry about lacking food	12%	18.6%	13%
At least 1 day			
Depend on less preferred/cheaper food	20.5%	27.5%	21.5%
Ate smaller portions	11.6%	11.3%	11.6%
Ate fewer meals	11.4%	13.5%	11.7%
Adults restricted food consumption	10.2%	11.4%	10.4%
Borrowed food or depended on others to eat	7.73%	8.22%	7.8%
Not enough to eat (past 12 months)	13.6%	16.2%	14%
Number of days (mean)			
Depend on less preferred/cheaper food	0.519	1.009	0.592
Ate smaller portions	0.254	0.295	0.260
Ate fewer meals	0.269	0.314	0.276
Adults restricted food consumption	0.212	0.227	0.214
Borrowed food or depended on others to eat	0.163	0.147	0.161
Meals per day			
Adults	2.837	2.778	2.829
Children under 5	4.079	3.976	4.064

Table 97 - Food security by wealth quartile

	Wealth quartile				Total
	Lowest quartile (poorest)	Second	Third	Highest(richest)	
N	523	522	522	522	2089
Over the last 7 days					
Worry about lacking food	12.6%	11.4%	13.5%	11.1%	12.2%
At least 1 day					
Depend on less preferred/cheaper food	21.6%	21.5%	21.1%	18.6%	20.7%
Ate smaller portions	10.9%	9.66%	10.8%	11.4%	10.7%
Ate fewer meals	12%	10.7%	10%	11%	10.9%
Adults restricted food consumption	8.17%	10.8%	7.69%	11.1%	9.5%
Borrowed food or depended on others to eat	7.48%	7.09%	6.73%	6.95%	7.07%
Not enough to eat (past 12 months)	15.3%	15.7%	14%	10.2%	13.8%
Number of days (mean)					
Depend on less preferred/cheaper food	0.680	0.543	0.570	0.465	0.565
Ate smaller portions	0.312	0.206	0.201	0.205	0.231
Ate fewer meals	0.308	0.297	0.199	0.199	0.252
Adults restricted food consumption	0.173	0.256	0.145	0.202	0.195
Borrowed food or depended on others to eat	0.169	0.153	0.0961	0.145	0.141
Meals per day					
Adults	2.835	2.856	2.818	2.813	2.831
Children under 5	4.124	4.090	4.151	4.161	4.131

Peaks of food shortages differ across communes, with the most severe months being found in February in Bembéréké, June and July in Kalalé, May in Sinendé and April and May in Tchaourou. The main reasons given for food shortages are prices of food on the market (30%), insufficient plot size (24%), drought (21%) and a lack of inputs (16%). Drought appeared as less severe cause in Bembéréké, while high food prices stands out in Tchaourou. A greater percentage of female headed households and of migrant households report high food prices. Drought and insufficient plot size appear as more severe causes of food insecurity among migrant households.

Table 98 - Food shortage by commune

	Commune				Total
	Bembéréké	Bembéréké	Sinendé	Tchaourou	
Food shortage over the last year					
N	78	118	92	87	375
What month did this situation occur?					
January	11.3%	8.47%	3.26%	3.2%	5.66%
February	42%	5.7%	13.8%	9.78%	16.2%
March	25.2%	13.5%	21.9%	37.3%	26%
April	21.8%	15.8%	17.7%	52.3%	29.3%
May	30.8%	34.1%	23.9%	46.5%	34.3%
June	22.2%	44.1%	13.2%	20.4%	22.8%
July	24%	59.8%	10.1%	4.6%	19.8%
August	20%	23.4%	5.64%	1.27%	10.1%
September	8.09%	1.02%	1.33%	2.22%	2.81%
October	7.4%	0.508%	1.33%	0.583%	2.06%
November	8.07%	0.719%	1.02%	3.17%	2.96%
December	8.07%	3.75%	0%	4.72%	3.69%
Reason for food shortage					
Insufficient stock due to drought	9.23%	21.3%	25.5%	22.6%	20.8%
Insufficient stock due to pests	9.65%	10.5%	2.82%	26.2%	13%
Insufficient stock due to size of the plot	16.4%	25.3%	21.8%	28.7%	23.7%
Insufficient stock due to lack of inputs	13.4%	35.4%	8.43%	14.4%	16.1%
Food on the market is too expensive	29.4%	18.6%	28.9%	37%	29.8%
Transport costs to the market too high	14%	1.41%	18.6%	2.96%	9.61%
No food on the market	3.05%	2.88%	1%	0.719%	1.63%
Floods / water-logging	3.3%	3.73%	0%	0%	1.28%
Other	24.3%	12.4%	3.48%	12.9%	12%

Table 99 - Food shortage by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Food shortage over the last year												
N	33	43	11	21	46	16	32	39	47	42	45	375
What month did this situation occur?												
January	9.54%	8.17%	31.8%	8.73%	3.96%	0%	7.79%	16.4%	3.92%	3.85%	1.81%	5.66%
February	66.4%	17.6%	22.7%	1.8%	16.4%	20.9%	2.6%	13.6%	3.28%	10.2%	8.95%	16.2%
March	23.4%	22.6%	31.8%	6.93%	25.9%	27.8%	7.79%	36.8%	3.28%	45.5%	19.9%	26%
April	14.3%	20.5%	38.3%	13%	9.65%	38%	9.33%	40.2%	5.56%	60.3%	35.6%	29.3%
May	21%	37.8%	62.6%	15.7%	25.3%	20.3%	42.5%	23.2%	33.8%	49.5%	40%	34.3%
June	19.1%	18.2%	36.8%	9.64%	21.4%	6.42%	43.3%	23.4%	58.4%	10.9%	40.4%	22.8%
July	10.1%	34%	11.8%	27.7%	7.83%	0%	54.1%	33.5%	81.9%	4.8%	4.18%	19.8%
August	10.1%	25.3%	11.8%	24.4%	1.2%	0%	4.41%	20.6%	41.8%	0%	3.96%	10.1%
September	8.33%	5.76%	11.8%	7.83%	0%	0%	0%	3.95%	0%	1.59%	3.55%	2.81%
October	6.76%	5.76%	11.8%	7.83%	0%	0%	0%	1.98%	0%	0%	1.81%	2.06%
November	6.76%	6.8%	11.8%	6.03%	0%	0%	0%	2.8%	0%	0%	9.85%	2.96%
December	6.76%	6.8%	11.8%	0%	0%	0%	5.19%	7.57%	0%	4.27%	5.67%	3.69%
Reason for food shortage												
Insufficient stock due to drought	3.38%	22.8%	20%	26.8%	33.9%	3.21%	10.1%	26.3%	27.8%	11.7%	45.6%	20.8%
Insufficient stock due to pests	3.54%	9.97%	0%	0%	1.73%	10.2%	5.19%	15.9%	11.8%	36.8%	3.8%	13%
Insufficient stock due to size of the plot	8.36%	26.3%	8.34%	45.2%	25.1%	0%	27.7%	16.8%	28.8%	24.1%	38.5%	23.7%
Insufficient stock due to lack of inputs	9.71%	11.8%	25.8%	15.7%	8.32%	6.95%	46.9%	20%	35.4%	18.4%	5.91%	16.1%
Food on the market is too expensive	53.6%	15.5%	11.8%	17.5%	28.7%	34.8%	21.2%	14.8%	18.7%	44.5%	21.4%	29.8%
Transport costs to the market too high	29.7%	1.37%	0%	0%	14.1%	41.7%	2.6%	1.98%	0%	2.13%	4.73%	9.61%
No food on the market	3.16%	2.54%	0%	0%	2.23%	0%	8.3%	0%	0%	1.06%	0%	1.63%
Floods / water-logging	0%	5.07%	0%	0%	0%	0%	0%	1.98%	8.15%	0%	0%	1.28%
Other	18.8%	20.6%	45.9%	7.83%	2.63%	3.21%	7%	21.1%	11.6%	15.7%	6.96%	12%

Table 100 - Food shortage by gender of HH head

	HH head gender		Total
	Male	Female	
<i>Food shortage over the last year</i>			
N	271	63	334
<i>What month did this situation occur?</i>			
January	4.61%	9.99%	5.7%
February	16.5%	20.5%	17.3%
March	20.3%	44.8%	25.3%
April	25.4%	27.1%	25.7%
May	32.9%	32.8%	32.8%
June	25.4%	16.6%	23.6%
July	22%	14%	20.4%
August	11.7%	6.34%	10.6%
September	2.95%	4.18%	3.2%
October	1.61%	5.24%	2.35%
November	2.55%	6.63%	3.38%
December	1.67%	11.8%	3.72%
<i>Reason for food shortage</i>			
Insufficient stock due to drought	25.7%	8.26%	22.2%
Insufficient stock due to pests	11.3%	15.3%	12.1%
Insufficient stock due to size of the plot	24.7%	12.4%	22.2%
Insufficient stock due to lack of inputs	18.2%	3.46%	15.2%
Food on the market is too expensive	27.5%	38.3%	29.7%
Transport costs to the market too high	9.87%	10.7%	10%
No food on the market	1.99%	0%	1.59%
Floods / water-logging	1.83%	0%	1.46%
Other	6.85%	26.6%	10.9%

Table 101 - Food shortage by migration status

	Migrant status		
	Non Migrant	Migrant	Total
Food shortage over the last year			
N	311	64	375
What month did this situation occur?			
January	6.27%	2.71%	5.66%
February	15.7%	19.1%	16.2%
March	24%	35.8%	26%
April	29.3%	29.4%	29.3%
May	36.4%	23.9%	34.3%
June	24.4%	14.7%	22.8%
July	21.3%	12.8%	19.8%
August	10.8%	6.42%	10.1%
September	2.23%	5.64%	2.81%
October	2.14%	1.66%	2.06%
November	2.63%	4.55%	2.96%
December	3.74%	3.42%	3.69%
Reason for food shortage			
Insufficient stock due to drought	18.8%	30.5%	20.8%
Insufficient stock due to pests	12.8%	14.2%	13%
Insufficient stock due to size of the plot	23.1%	26.7%	23.7%
Insufficient stock due to lack of inputs	19.2%	1.1%	16.1%
Food on the market is too expensive	28.4%	36.4%	29.8%
Transport costs to the market too high	11.6%	0%	9.61%
No food on the market	0.873%	5.27%	1.63%
Floods / water-logging	1.54%	0%	1.28%
Other	12.4%	10%	12%

5.9 WOMEN’S AND YOUNG MEN’S EMPOWERMENT

We have already examined the extent to which women and young men have access to land. Now, we consider more general measures of these groups’ bargaining power and involvement in society.

WOMEN

In most cases, we see that wealth is unevenly managed which likely gives men a much stronger bargaining position within their marriages. 94% of women stated that their husband brought more wealth into their marriage. Tchaourou G1 stands out in this regard with 9% of women having brought more wealth into their marriage. Similar to access to land, in most cases men would keep the house if the woman and her partner were to separate. This is less commonly the case in Tchaourou with important variations across clusters. Access to land does not really improve with household wealth.

Very few women own tablets, cars, motorcycles or bicycles as one might expect. More own mobile phones, averaging at 43% across the four communes, with a higher proportion in Tchaourou and a lower proportion in Kalalé, being as low as 14% in Kalalé G3. Mobile phone ownership varies

considerably by household wealth, ranging from 18% in the lowest quartile to 67% in the highest one. Regarding these disparities, if project interventions would like to reach women via mobile phones, information would spread unequally across clusters and poorer women would tend to be left out. Female household head are also more likely to own a mobile phone.

Slightly more than half of women claim to be able to make decisions about their own money and assets, which again is higher in Tchaourou than elsewhere, this time with Sinendé as the commune with the lower value. Female household head have more decision-making power over these decisions.

Table 102 - Women's rights by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<i>Brought most wealth</i>					
You	0.8%	0.8%	1.4%	6.3%	2.4%
Spouse	98.4%	97.4%	97.4%	84.6%	94.4%
Equal	0.9%	1.8%	1.2%	9.2%	3.2%
<i>Who keeps house if separate</i>					
Being investigated	1.3%	1.1%	3.1%	4.6%	2.6%
Spouse/husband	79.0%	74.7%	72.9%	66.2%	73.3%
Spouse/husband and wife/spouse jointly	3.9%	3.7%	5.1%	5.5%	4.6%
To children	15.0%	20.1%	18.2%	20.7%	18.2%
Can make decisions over own money/possessions	59.1%	51.7%	36.9%	66.4%	53.2%
N	864	613	601	568	2646
<i>Assets</i>					
Cellphone	38.2%	21.8%	41%	63.1%	43%
N	863	613	601	566	2643
Computed/tablet	0.534%	0.554%	0.471%	0%	0.376%
N	859	612	592	564	2627
Car/truck	0.328%	0.668%	0.295%	0%	0.284%
N	862	611	590	565	2628
Motorbike	3.56%	2.2%	2.19%	1.38%	2.36%
N	862	609	592	561	2624
Bike/bicycle	1.67%	0.93%	2.4%	0.28%	1.41%
N	850	599	590	555	2594

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Table 103 - Women's rights by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<i>Brought most wealth</i>												
You	1.7%	0.7%	0.0%	1.6%	1.0%	1.5%	0.3%	1.3%	1.1%	9.0%	1.9%	2.4%
Spouse	98.3%	97.8%	99.4%	97.6%	97.8%	96.9%	97.1%	97.4%	97.9%	79.6%	92.4%	94.4%
Equal	0.0%	1.4%	0.6%	0.9%	1.2%	1.5%	2.6%	1.3%	1.1%	11.4%	5.7%	3.2%
<i>Who keeps house if separate</i>												
Being investigated	2.8%	1.4%	1.1%	1.6%	2.9%	3.1%	1.3%	1.3%	0.7%	4.4%	5.0%	2.6%
Spouse/husband	81.2%	87.4%	62.4%	61.0%	79.5%	60.0%	69.6%	68.4%	85.7%	72.6%	56.1%	73.3%
Spouse/husband and wife/spouse jointly	5.1%	3.3%	2.3%	7.1%	4.2%	5.3%	5.8%	0.9%	3.2%	7.4%	2.6%	4.6%
To children	9.7%	7.6%	33.0%	30.2%	12.0%	31.6%	23.3%	28.6%	9.7%	13.2%	32.5%	18.2%
Other	1.2%	0.4%	1.2%	0.2%	1.5%	0.0%	0.0%	0.8%	0.8%	2.4%	3.8%	1.3%
Can take decisions over own money/possessions	58.9%	58.7%	45.8%	38.3%	34.3%	47.5%	59%	58.5%	36.4%	68.3%	63.2%	53.2%
N	303	357	207	200	302	96)	210	199	204	279	289	2646
<i>Assets</i>												
Cellphone	40.6%	33.6%	39.7%	40%	38.3%	53.5%	27.6%	21.4%	14.4%	68.6%	54.1%	43%
N	303	356	207	200	302	96	210	199	204	279	287	2643
Computer/tablet	1.39%	0.319%	0.531%	0%	0.635%	0%	0.814%	0.805%	0%	0%	0%	0.376%
N	303	352	205	198	297	96	210	199	203	277	287	2627
Car/truck	0.465%	0.633%	0%	0%	0.27%	0%	1.09%	0.808%	0%	0%	0%	0.284%
N	303	353	206	198	296	96	210	198	203	278	287	2628
Motorbike	3.05%	4.64%	2.88%	0.45%	3.6%	0%	2.28%	2.04%	2.23%	1.05%	1.92%	2.36%
N	303	354	206	198	297	96	210	196	203	276	285	2624
Bike/bicycle	1.36%	3.16%	1.61%	0%	2.88%	1.44%	1.37%	1.37%	0%	0.306%	0.238%	1.41%
N	299	348	203	198	296	96	207	190	202	272	283	2594

Table 104 - Women's rights by wealth quartile

	Wealth quartile				Total
	Lowest quartile (poorest)	Second	Third	Highest (richest)	
Brought most wealth					
You	0.8%	2.4%	3.5%	2.2%	2.2%
Spouse	95.7%	95.1%	91.8%	94.2%	94.3%
Equal	3.5%	2.4%	4.6%	3.6%	3.5%
Who keeps house if separate					
Being investigated	1.5%	2.7%	4.7%	3.0%	3.0%
Spouse/husband	76.8%	73.4%	71.0%	76.8%	74.6%
Spouse/husband and wife/spouse jointly	3.7%	3.7%	4.7%	3.8%	4.0%
To children	17.4%	20.0%	19.2%	15.8%	18.1%
Other	0.6%	0.2%	0.5%	0.6%	0.5%
Can take decisions over own money/possessions	49.5%	58.6%	52.5%	59.5%	55%
N	466	472	484	485	1907
Assets					
Cellphone	18.1%	36%	53.9%	67%	43.7%
N	466	470	484	485	1905
Computer/tablet	0.214%	0.348%	0.826%	0.396%	0.444%
N	465	468	481	481	1895
Car/truck	0.214%	0.349%	0.563%	0%	0.281%
N	466	466	482	480	1894
Motorbike	1.52%	2.59%	2.93%	3.47%	2.62%
N	465	466	481	480	1892
Bike/bicycle	1.35%	2.68%	2.07%	0.594%	1.68%
N	461	460	480	471	1872

Table 105 - Women's asset ownership by gender of the HH head

	HH head gender		
	Male	Female	Total
Can take decisions over own money/possessions	51.8%	64.3%	53.2%
N	2354	292	2646
Assets			
Cellphone	41.3%	55.9%	43%
N	2351	292	2643
Computer/tablet	0.236%	1.44%	0.376%
N	2338	289	2627
Car/truck	0.267%	0.414%	0.284%
N	2338	290	2628
Motorbike	2.15%	3.94%	2.36%
N	2336	288	2624
Bike/bicycle	1.34%	1.86%	1.41%
N	2308	286	2594

The most common response to whether women take part in local meetings in all communes was “never” (41.3% of women). The most common reason given for this response is that the meetings are useless (30.2% of women). However, this percentage is as low as 5.4% in Kalalé where more women report no assembly having taken place. The second main reason is a lack of information about these meetings (21.8%) and not feeling welcomed (15.3%). Lack of information is particularly highly mentioned in Sinendé G3 and Kalalé G3. All together, these results suggest a lack of appropriate communication towards women. This is crucial to consider in order to raise women’s awareness about PFR.

In terms of political participation more broadly, roughly half the women always vote in local elections. Participation is worse in Bembéréké, but “always” is still the modal response. While local elections seem to be important to the women interviewed, very few took part in the decision-making process who would sit on the land management committee. Membership in local associations is low and those who are members of an organisation are mostly not in the named organisations of the survey.

Table 106 - Women's political engagement by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Assist at local assemblies					
Always	11.1%	13.6%	11.1%	17.6%	13.2%
Sometimes	28.2%	23.7%	28.1%	18.9%	25.0%
Rarely	22.7%	13.9%	26.0%	16.0%	20.5%
Never	38.0%	48.8%	34.8%	47.5%	41.3%
If no: Why not?					
No assembly	15.1%	32.3%	11.9%	6.8%	15.0%
Too far	5.4%	1.8%	2.1%	1.8%	2.8%
Not up to date	14.5%	27.2%	21.7%	24.6%	21.8%
Not welcome/not invited	17.2%	13.4%	5.4%	23.0%	15.3%
No use	33.7%	5.4%	39.2%	35.0%	30.2%
Do not agree with these assemblies	4.9%	10.2%	10.1%	2.7%	6.5%
Other	9.2%	9.7%	9.6%	6.1%	8.4%
Vote in local elections					
Always	35.9%	63.9%	49.3%	59.0%	50.4%
Sometimes	30.6%	17.9%	19.9%	21.9%	23.1%
Rarely	21.1%	5.2%	14.4%	8.3%	13.2%
Never	12.3%	13.0%	16.5%	10.8%	13.3%
Member in local association/group	8.52%	12.8%	10.9%	26.6%	14.7%
N	864	613	601	568	2646
Association in which respondent is member					
SVGF (Section Villageoise de Gestion Foncière)	0%	0%	0%	0%	0%
COGEF (Commission de Gestion Foncière)	0%	0%	1.18%	0%	0.261%
OPA (Organisation des Producteurs Agricoles)	3.14%	0.891%	2.57%	1.68%	2%
GIE (Groupement d'Intérêt Économique)	33.7%	13.9%	18.3%	39.9%	30.6%
Other	75.6%	85.2%	79.1%	61.2%	70.8%
N	68	80	57	138	343
Voted in election of committee	5.19%	6.18%	5.79%	8.51%	5.79%
N	151	65	62	20	298
Member of comité de gestion foncière	0%	2.42%	2.48%	0%	1.15%
N	151	65	62	20	29

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Table 107 - Women's political engagement by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<i>Assist at local assemblies</i>												
Always	16.8%	8.8%	2.5%	7.7%	7.4%	24.1%	21.2%	7.5%	8.7%	24.3%	6.9%	13.2%
Sometimes	40.4%	16.5%	23.6%	34.2%	26.7%	35.2%	18.3%	32.9%	23.3%	19.5%	18.0%	25.0%
Rarely	24.6%	23.1%	28.9%	20.6%	25.5%	26.9%	15.3%	13.3%	12.4%	9.4%	26.6%	20.5%
Never	18.2%	51.7%	45.1%	37.5%	40.4%	13.8%	45.3%	46.3%	55.6%	46.8%	48.5%	41.3%
<i>If no: Why not?</i>												
No assembly	30.8%	11.0%	22.9%	17.1%	9.8%	0.0%	51.1%	23.4%	18.1%	10.8%	0.5%	15.0%
Too far	5.1%	5.8%	2.2%	1.9%	2.7%	0.0%	2.7%	0.0%	1.9%	1.3%	2.7%	2.8%
Not up to date	7.8%	10.6%	18.6%	22.3%	23.6%	49.6%	10.5%	23.9%	47.6%	31.1%	14.3%	21.8%
Not welcome/not invited	13.3%	16.4%	16.2%	0.5%	7.5%	15.2%	14.2%	22.5%	6.3%	16.0%	33.7%	15.3%
No use	23.3%	40.5%	29.9%	36.3%	41.1%	9.6%	3.7%	7.1%	5.9%	32.2%	39.4%	30.2%
Do not agree with these assemblies	3.8%	6.7%	4.4%	16.8%	5.9%	4.8%	13.5%	9.8%	6.8%	3.3%	1.9%	6.5%
Other	16.0%	9.0%	5.9%	5.0%	9.3%	20.8%	4.2%	13.2%	13.3%	5.3%	7.3%	8.4%
<i>Vote in local elections</i>												
Always	33.9%	34.0%	33.3%	62.5%	47.7%	45.9%	68.2%	61.6%	60.1%	54.2%	66.8%	50.4%
Sometimes	35.2%	26.0%	29.2%	17.8%	17.5%	31.4%	18.8%	25.4%	10.5%	23.1%	19.9%	23.1%
Rarely	25.6%	19.3%	18.4%	5.1%	16.0%	20.7%	3.5%	5.1%	7.6%	10.7%	4.5%	13.2%
Never	5.3%	20.7%	19.1%	14.7%	18.9%	2.1%	9.5%	7.9%	21.8%	12.0%	8.8%	13.3%
Member in local association/group	15%	4.81%	4.1%	8.55%	8.7%	19.9%	9.29%	19.5%	11.9%	28%	24.5%	14.7%
N	303	357	207	200	302	96	210	199	204	279	289	2646

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Association in which respondent is member												
SVGF (Section Villageoise de Gestion Foncière)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
COGEF (Commission de Gestion Foncière)	0%	0%	0%	0%	3.04%	0%	0%	0%	0%	0%	0%	0.261%
OPA (Organisation des Producteurs Agricoles)	0%	16.7%	0%	5.21%	0%	0%	2.92%	0%	0%	2.01%	1.06%	2%
GIE (Groupement d'Intérêt Économique)	31.9%	27.5%	39.6%	25.4%	17.4%	21.1%	15.1%	11.9%	15.6%	32%	54.6%	30.6%
Other	80.1%	72.9%	60.4%	69.4%	82.6%	78.9%	82%	88.1%	84.4%	67.6%	49.4%	70.8%
N	42	16	8	15	28	16	21	33	26	61	77	343
<hr/>												
Voted in election of committee	8.49%	3.57%	0%	0%	8.26%	4.73%	5.87%	7.58%	0%	0%	12.2%	5.79%
N	93	48	9	18	19	26	35	27	3	5	15	298
Member of comité de gestion foncière	0%	0%	0%	6.72%	4.13%	0%	2.12%	3.31%	0%	0%	0%	1.15%
N	93	48	9	18	19	26	35	27	3	5	15	298

YOUNG MEN

Slightly less than 50% of interviewed unmarried men between 18 and 35 years old are in a position to make their own financial decisions, having their own money and assets and being able to choose what to do with it, this percentage ranging from 33% in Sinendé to 58% in Bembéréké. This is a little lower than for women in our sample. Although the young men have a little less autonomy financially, they do have more assets than women. 74% of the young men own a mobile phone and 45% have a motorcycle. Ownership of motorcycles and bicycles represents a major difference to women’s asset ownership.

Table 108 - Young men’s finances by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
Can make decisions over own money/possessions	58.3%	52.4%	33%	44.6%	46.9%
N	282	139	144	119	684
Assets					
Cellphone	73.6%	65.9%	72.9%	87.3%	75.6%
N	280	139	144	119	682
Computer or tablet	1.61%	0.528%	0.666%	0.634%	0.963%
N	280	138	142	117	677
Car or truck	2.08%	0.528%	0%	0%	0.781%
N	280	138	140	117	675
Motorcycle	44.6%	47.1%	47.5%	36.8%	43.9%
N	281	138	143	116	678
Bike/Bicycle	20.4%	7.89%	10.4%	8.99%	13.1%
N	279	138	141	117	675

For young men, participation in local meetings is still distributed such that attendance does not appear to very common. “Never” is the most common response across the four communes, but more young men attend than women interviewed. As was the case for women, in Tchaourou more state that they never attend than elsewhere. The reasons for not attending only slightly differ with a lower percentage stating that these meetings are useless (24%) and the primary reason for not attending being due to a lack of knowledge that the meetings take place (24.6%). 13.1% of them did not feel welcomed. Few young men belong to any groups – at lower levels than women - and those who do are more likely to belong to other unnamed associations.

Table 109 - Young men's political engagement by commune

	Commune				Total
	Bembéréké	Kalalé	Sinendé	Tchaourou	
<i>Assist at local assemblies</i>					
Always	20.6%	15.0%	12.1%	19.2%	17.0%
Sometimes	36.0%	22.3%	40.8%	22.5%	32.5%
Rarely	23.8%	24.9%	25.1%	9.9%	21.0%
Never	19.6%	37.8%	21.9%	48.4%	29.5%
<i>If never: Why not?</i>					
No assembly	22.7%	23.4%	12.6%	15.0%	17.6%
Too far	1.6%	1.6%	3.0%	0.6%	1.5%
Not up to date	20.0%	40.2%	30.3%	17.4%	24.6%
Not welcome/not invited	5.4%	12.9%	3.5%	23.2%	13.1%
Useless	36.8%	7.9%	34.0%	17.4%	23.8%
Disagrees with these meetings	6.8%	7.9%	10.7%	7.5%	8.1%
Other	6.8%	6.2%	6.0%	19.0%	11.3%
Member of any local association/group	8.83%	3.75%	11.4%	18.9%	11.3%
	282	139	144	119	684
<i>If yes: Which group?</i>					
SVGF	0%	0%	0%	0%	0%
CoGeF	0%	0%	0%	0%	0%
OPA (Agricultural producers organisation)	30.7%	0%	15%	0%	12.6%
GIE (Economic interests group)	0%	0%	0%	0%	0%
Other	86.9%	100%	85%	100%	92.1%
N	21	5	14	15	55

Table 110 - Young men's finances by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
Can make decisions over own money/ possessions	50%	59.7%	51.3%	28.8%	36.3%	47.4%	69.1%	46.8%	42.6%	49.5%	36.4%	46.9%
N	105	100	70	50	67	34	34	43	62	52	67	684
Assets												
Cellphone	73.5%	72.4%	79%	75.2%	70.1%	74.8%	74%	71%	57%	88.7%	84.9%	75.6%
N	104	100	69	50	67	34	34	43	62	52	67	682
Computer or tablet	1.32%	2.38%	0%	2.47%	0%	0%	1.58%	0%	0%	0%	1.68%	0.963%
N	104	99	70	48	67	34	34	43	61	51	66	677
Car or truck	1.31%	3.31%	0%	0%	0%	0%	1.58%	0%	0%	0%	0%	0.781%
N	105	100	68	47	66	34	34	43	61	51	66	675
Motorcycle	36.6%	52.7%	56.9%	45%	48.3%	37.7%	39.7%	51.3%	50.5%	33.3%	42.6%	43.9%
N	104	100	70	49	67	34	34	43	61	51	65	678
Bike/Bicycle	16.6%	30.9%	4.94%	0%	13.9%	8.78%	8.23%	12.9%	4.84%	11.6%	4.65%	13.1%
N	104	99	70	48	66	33	34	43	61	51	66	675

Table 111 - Young men's political engagement by cluster

	Cluster											Total
	1. Bem G1	2. Bem G2	3. Bem G3	4. Sin G1	5. Sin G2	6. Sin G3	7. Kal G1	8. Kal G2	9. Kal G3	10. Tch G1	11. Tch G2	
<i>Assist at local assemblies</i>												
Always	23.5%	19.2%	7.4%	9.9%	7.7%	27.2%	17.7%	21.8%	9.2%	27.7%	5.2%	17.0%
Sometimes	48.0%	29.6%	21.9%	51.5%	46.7%	24.8%	16.7%	27.7%	23.7%	21.4%	24.4%	32.5%
Rarely	12.1%	34.9%	32.5%	12.9%	23.3%	29.5%	35.9%	11.9%	23.5%	3.0%	21.3%	21.0%
Never	16.5%	16.3%	38.2%	25.7%	22.4%	18.5%	29.7%	38.6%	43.6%	47.9%	49.2%	29.5%
<i>If never: Why not?</i>												
No assembly	36.6%	20.0%	26.3%	24.9%	3.4%	0.0%	36.9%	36.0%	10.3%	20.6%	5.8%	17.6%
Too far	0.0%	0.0%	6.3%	9.2%	0.0%	0.0%	0.0%	0.0%	3.1%	1.0%	0.0%	1.5%
Not up to date	15.0%	2.8%	25.7%	23.6%	48.4%	32.1%	5.3%	27.9%	64.2%	6.6%	34.7%	24.6%
Not welcome/not invited	8.9%	6.8%	0.0%	10.6%	0.0%	0.0%	22.4%	29.4%	0.0%	21.3%	26.2%	13.1%
Useless	27.5%	49.1%	25.0%	26.3%	48.2%	21.4%	15.0%	0.0%	8.0%	20.0%	13.1%	23.8%
Disagrees with these meetings	0.0%	18.5%	8.2%	5.5%	0.0%	23.2%	7.6%	6.6%	8.6%	9.2%	4.8%	8.1%
Other	12.0%	2.8%	8.5%	0.0%	0.0%	23.2%	12.7%	0.0%	5.7%	21.3%	15.3%	11.3%
Member of any local association/group	12.9%	8.01%	3.25%	5.78%	9.96%	17.2%	4.98%	1.8%	3.86%	24.5%	9.7%	11.3%
	105	100	70	50	67	34	34	43	62	52	67	684
<i>If yes: Which group?</i>												
SVGF	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CoGeF	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
OPA (Agricultural producers organisation)	10.8%	57.1%	0%	0%	37.6%	0%	0%	0%	0%	0%	0%	12.6%
GIE (Economic interests group)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	100%	70.4%	100%	100%	62.4%	100%	100%	100%	100%	100%	100%	92.1%
N	12	7	2	3	7	4	1	1	3	9	6	55

FURTHER TESTS AND POWER CALCULATIONS

5.10 BALANCE TESTS

A comparison between households in the treatment PFR villages and in the control villages allows us to assess the validity of our strategy of identification of the impacts of the programme. Given the lack of information available on the villages in Benin, our matching strategy was rather coarse and relies on information observable by satellite. Geographic proximity should enhance the similarity of treated and control villages in observable and unobservable characteristics. To assess the extent of this similarity, we compare initial characteristics that could affect the outcomes of interest, and the baseline values of these outcomes, by the means of statistical tests (t-tests).

These tests are used to calculate whether differences between the two groups are statistically sufficiently certain (statistically significant). As long as these differences are not statistically significant, the groups will be considered to be similar in these characteristics. If these groups are on average similar, any differences arising after the programme can be attributed to the ProPFR. If there are significant differences, we will explore the possibility to complement the matching strategy with a DiD approach.

The results of the balance tests are reported in [Appendix 1: Balance Tables](#). Each balance table is organised into 4 columns. The first column provides the variable name, the second and third columns report the means and the standard errors of these variables in treated villages and control villages respectively, and the last column shows the difference between the mean in treated and control villages. Stars indicate whether these differences are statistically significant at the 1% (three stars), 5% (2 stars) and 10% (1 star) critical level. The statistical tests were performed with clustered standard errors at the village level to account for greater similarity between households of a same village as well as the clustering of the treatment.

Although most of household characteristics are on average similar between ProPFR and control villages, the following analysis points out several notable differences preventing a simple comparison of outcomes at endline. Differences in the distribution of some characteristics need to be taken into account by including relevant characteristics in future analyses of a causal impact of the programme. Furthermore, initial differences in outcomes should be accounted for by following a DiD approach.

The remainder of this section discusses the balance of each section of [Appendix 1: Balance Tables](#).

5.10.1. SOCIOECONOMIC PROFILE OF BENEFICIARIES

There is no significant difference in households' socio-demographic characteristics, economic status and land ownership between ProPFR villages and control villages. However, a greater percentage of households has previously lost a plot in ProPFR villages than in control villages (5.8% against 3.2% in control villages).

5.10.2. LAND CONFLICTS AND PERCEPTION OF LAND SECURITY

Households are similar in terms of occurrence of land conflicts and the characteristics of these conflicts between ProPFR and control villages. One exception is that more households in ProPFR villages reported conflicts with someone outside the village and with administrative authority, in comparison with control villages (respectively, 11.5% against 5.7% and 3.9% against 1.1%).

Overall, feelings of land insecurity are low among households interviewed for the survey. Households in control villages feel more secure, with more control households stating they do not fear losing land (61.5% against 54.4% in ProPFR villages).

5.10.3. LAND ACQUISITION AND LAND RIGHTS FORMALISATION

Modes of land acquisition are rather similar for non-agricultural and agricultural land but differ between households in ProPFR and in control villages for non-agricultural plots. A lower percentage of non-agricultural plots was inherited in ProPFR villages (31.1% against 44.8% in control villages). Ownership title has a very low occurrence among the households interviewed for the survey, with no difference between ProPFR and control villages. There is a slight difference between households reporting having lost their title for their agricultural plot in ProPFR and control villages, this percentage being 4.5 percentage points lower in ProPFR villages. The percentage of plots not owned by the household is higher in control villages (7% against 1.3% in ProPFR villages). These differences are only significant at the 10% critical level.

Regarding village structures for land affairs, a higher number of ProPFR villages have one (92.3%) in comparison with control villages (74.1%). Given that the establishment of SVGFs had begun before the survey started, this is not surprising. Notably, there is a greater prevalence of *Section Villageoise de Gestion Foncière* in treated villages, but this difference is not statistically significant. The involvement of the department of land affairs in land matters is also greater in ProPFR villages. Some differences also arise concerning the role of these structures. The district council plays a greater role with land acquisition in control villages, while it is not involved in this matter in ProPFR villages. Similarly, it is more involved in raising awareness on the PFR in control villages. The elders' council is more involved in conflict mediation than the village council in ProPFR villages, while the opposite holds true in control villages. Its role is also more importing regarding setting up the PFR in ProPFR villages than in control villages. Finally, the department of land affairs is the main structure collecting taxes in 43.5% of control villages, while this is the case of only 16% of ProPFR villages.

5.10.4. AWARENESS OF PFR

There are no significant differences regarding having heard about the new *Code Foncier et Domanial* and a little more about the PFR or the ADC between ProPFR and control villages. Overall, media represent a more prevalent source of information in ProPFR villages. 3.9% of households in ProPFR villages heard about the new *Code Foncier* on the television, against less than 0.9% of households in control villages, and 65.4% of households in ProPFR villages heard about PFR or ADC at the radio, against 43.2% in control villages.

Information meetings about ADC in the village were reported by a higher percentage of households in ProPFR villages (38.5% against 24.4%) while participation rates are on average similar between ProPFR and control villages. A higher percentage of households in ProPFR villages did not feel welcomed or invited in these meetings (21.9% against 3.2% in control villages) and disagreed with these assemblies (3.6% against 0% in control villages), in comparison with control villages. 52% of household heads who have heard about the PFR reported that their village is or was subject to a PFR while this is the case for 20% of household heads in control villages.

The benefits of land registration are largely supported among the households interviewed for this survey. Overall, these opinions do not differ between household heads of ProPFR and control villages. Only two minor differences are notable: the percentage of households that reported that it will increase conflict is greater in ProPFR villages by 1.4 percentage points, and that of households that

reported that it will decrease investment on the plot by 1.7 percentage points. In ProPFR villages, a greater percentage of households believe that tenants' and sharecroppers' rights will be more secured (81.2% against 71.9% in control villages) and a lower percentage thinks that it will not affect herders' rights and foreigners' land rights.

5.10.5. ACCESS TO FINANCE

Loan requests, obtention rates and credit characteristics do not statistically differ between adult household members of ProPFR and control villages. While the majority of loan applications did not require any document, this percentage is higher for individuals of ProPFR villages by 32.2 percentage points. Indeed, in control villages, a higher proportion of individuals reported being asked non-official documents attesting the land transaction (39.2% against 11.8% in ProPFR villages). More individuals in ProPFR villages used their last loan for health purposes (8.7% against 3.2% in control villages).

5.10.6. AGRICULTURAL INPUTS AND INVESTMENT ON THE PLOT

Overall, agricultural inputs and investment on the plots are very similar across households in ProPFR and control villages. There are negligible differences in grain crusher and husker ownership (respectively, 0.8 and 0.7 of a percentage point). Sprayer ownership is also higher in ProPFR villages (31% of households against 21.2% in control villages). Households in ProPFR villages own on average more horses and chicken. Monoculture is less spread in control villages, concerning 82% of fields in comparison with 92% of fields in ProPFR villages. Maize fields are fewer in ProPFR villages than in control villages, but this difference is small (3.5 percentage points).

5.10.7. AGRICULTURE PRODUCTION

While agricultural production is rather similar between households of ProPFR and control villages, the use of harvests differs between the two groups. A greater share of the primary harvest is sold in ProPFR villages (65.4% of field harvests against 59.5% in control villages), while the opposite holds true for the secondary harvest (32.9% of field harvests against 47.1% in control villages), the main use of the secondary harvest being household consumption in ProPFR villages. The share of the primary crop harvest that is lost is on average greater in ProPFR villages (0.61% of field harvests against 0.32% in control villages). This difference, while statistically significant, is so small as to be negligible on average.

5.10.8. FOOD SECURITY

Indicators of food security are rather similar between households in ProPFR and control villages. Nevertheless, among coping strategies to deal with food shortages, more households in control villages had to eat fewer meals than in ProPFR villages (29.4% against 21% in ProPFR villages). This is also reflected in the average numbers of meals by adults and infants per day, these numbers being higher in ProPFR villages.

5.10.9. WOMEN AND YOUNG MEN'S EMPOWERMENT

Women interviewed for the survey share on average similar characteristics. However, women seem to enjoy fewer rights over land in case of the loss of their husband in ProPFR villages. Fewer women indicated that they would retain less than half of land in control villages in comparison with women

in ProPFR village in case of separation with their husband (2.9% against 5.3% in ProPFR villages) and the death of their husband (19.4% against 27% in ProPFR villages). Women’s entitlements appear to depend more on the agreement of the village chief and less on that of the family in ProPFR villages in comparison with control villages. Nevertheless, women’s resources and actual land rights do not appear to differ systematically.

Women’s participation in the community is rather similar across ProPFR and control villages. Corroborating results reported by the household head, more women reported not participating to the meetings because they disagree with them in ProPFR villages (9.8% against 4% in control villages).

Young men appear to enjoy greater land rights in control villages than in ProPFR villages. Half of young men in control villages reported deciding which plot to manage, which is the case for less than one third of young men in ProPFR villages. The percentages of young men being able to use household equipment and labour force, deciding on how to use the harvest, and being allowed to buy a plot are all greater in control villages, these differences ranging from 8.9 to 20.2 percentage points. Correspondingly, young men’s entitlements rely more importantly on the agreement of the family in ProPFR villages than in control villages.

A last notable difference concerns young men’s voting behaviour, the percentage of young men never voting for local elections being lower in ProPFR villages (14% against 22.6% in control villages).

5.11. INVESTIGATION OF THE POTENTIAL USE OF MATCHING

As described above, finding an appropriate control group presented a major challenge in the planning of this evaluation. Given the lack of data *ex ante*, even on a village level, we were restricted to using information taken from GIS data on the villages in the region and then randomly sampling households within those villages. Overall, the households appear well matched though there are some differences remaining. For this reason, we investigate the possibility to use matching in the analysis of the impacts of the ProPFR on households’ outcomes of interest. We present one potential specification for the first stage to be used in propensity score matching (PSM) along with a histogram displaying the extent of common support between the treatment and the control groups.

We run a probit regression of the form:

$$T_{iv} = \alpha + \beta X_{iv} + \gamma Z_v + \varepsilon_i \tag{1}$$

where T_{iv} is a dummy variable equal to one for household i assigned to a treatment village and zero for control households. X_{iv} includes household level variables and Z_v includes village level variables predicting the household’s propensity to be treated (the variation coming mostly from Z_v), as well as variables which are likely to affect the take-up of households for registration within the PFR in a given village and to affect variables of interest at endline (the variation coming mostly from X_{iv}). After running this probit regression, we take the predicted value of treatment as the propensity to be treated. We can then match across the treatment and control groups for observations with similar propensity scores. The use of the propensity score reduces the dimension of the number of variables to match across to one variable.

The aim of matching is not only to find households in villages which were equally likely to be treated, but also to find households who are comparable with respect to other covariates which may impact the outcomes of interest at endline. This means we balance the measured covariates between the two

groups. On the village level, we include dummies for each commune, for being close to a national forest (as defined by the ProPFR team), being a priority village for ProSol (a separate GIZ programme in the region focussed on the regeneration of soil), the presence of major conflicts likely to reignite, a high risk of land grabbing, whether a village was defined as using an agro-silvo-pastoral system, the presence of a transhumance corridor, and the presence of a common grazing area. Most of the aforementioned data is taken from the database shared by the ProPFR team during the dissemination mission to Borgou. Household level variables from the baseline survey included are a dummy for the presence of a female household head, a wealth index excluding land, the area of agricultural land owned, the area of non-agricultural land owned, the number of agricultural and non-agricultural plots, the age of the household head, a dummy for literacy status of the household head, a dummy for being a migrant from outside the department of Borgou, and whether any female manages a plot.

Using the predictions of the regression results from [Table 112](#), we calculate the propensity for treatment status to obtain the propensity score. These values are plotted below in Figure 32, where we can see that there is a strong enough degree of common support. While the treatment group has more households with a high propensity score and there are a large number in the control group with a propensity score close to zero, there is clear overlap in the distribution of the propensity scores from this specification with a large number of households with a propensity score of roughly 0.6 in both groups. There are 563 observations in the control group with a propensity score lower than the minimum of the treatment group (the bar furthest to the left in the control group) and 187 in the treatment group with a propensity score higher than the maximum in the control group (the bar furthest right). The null hypothesis of joint insignificance can clearly be rejected in the probit regression as indicated by the high Chi-squared statistic.

Figure 32 - Histogram showing propensity scores by treatment status

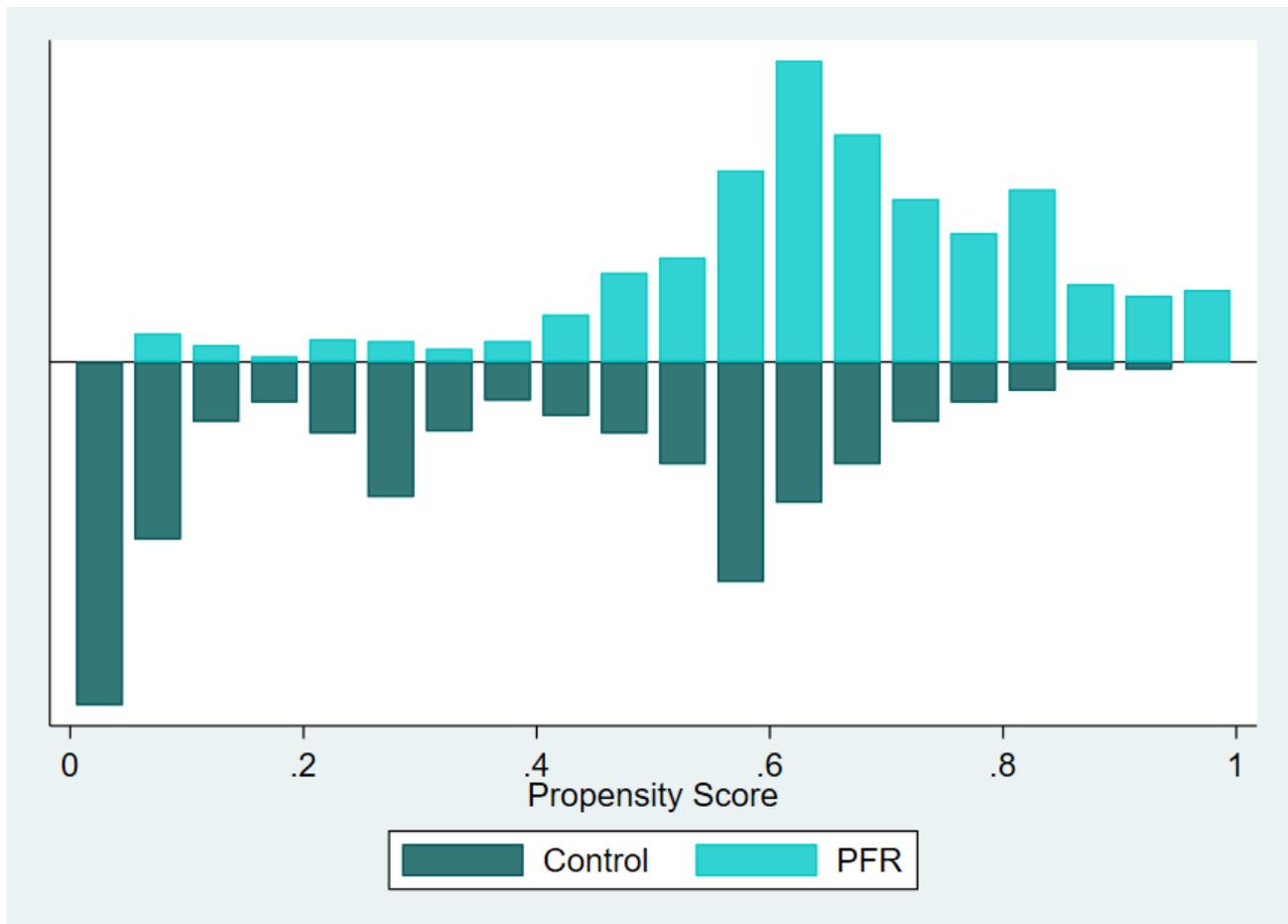


Table 112 - Marginal Effects from Probit to Predict Propensity Score

Variables	(1) Treatment
Kalalé (excluded Bembéréké)	0.197*** (0.0221)
Sinendé (excluded Bembéréké)	0.581*** (0.0162)
Tchaourou (excluded Bembéréké)	0.144*** (0.0265)
Forest nearby	0.305*** (0.0233)
Priority village ProSol	0.0516* (0.0302)
Major conflicts in village	0.429*** (0.0391)
Presence of transhumance corridor	-0.460*** (0.0535)
Presence of common pasture area	-0.0804* (0.0471)
Agro-silvo-pastoral	2.006 (36.85)
Risque d'accapement	-0.513*** (0.0392)
Agricultural land area	0.00499*** (0.00133)
Non-agricultural land area	0.00620 (0.00904)
Non-agricultural land: number of plots	-0.0228* (0.0121)
Agricultural land: number of plots	-0.0540* (0.0295)
Any plot managed by a female	0.100** (0.0422)
Heard of Code Foncier	-0.0292 (0.0246)
HH head is female	-0.111** (0.0451)
Age	0.00000312 (0.000696)
HH head migrant	0.110*** (0.0334)
Wealth Index	0.00100 (0.0110)
HH head literate	0.0217 (0.0261)
Observations	1852
Pseudo-R ² from Probit	0.261
Chi-squared from Probit	670.55

Standard errors in parentheses

* p<0.10 ** p<0.05 *** p<0.01

At endline we will investigate the use of various matching algorithms, including nearest-neighbour and kernel matching. We have seen above that the use of matching may indeed allow us to discard observations in the control group that are not comparable with the treatment group or use the propensity scores to apply appropriate weights in the comparison of the treatment and control households. This will ensure that observations are comparable in terms of observables but the reader should note that unobserved factors may still bias the results. If these are constant over time, the use of a difference-in-differences estimator may be combined with matching (see Smith & Todd, 2005), or alternatively the baseline variables may be controlled for in a regression which would allow us to relax the common trends assumption.

5.12. IDENTIFY CORRELATES TO THE OUTCOME VARIABLES

In this section, we examine the correlates of the main outcomes of interest. This exploratory analysis considers which factors are correlated with a variety of household level and plot level characteristics. Following the theory of change developed in Section [3. Impact Evaluation Design](#), we focus on perceived land insecurity, investments on the plot, agricultural output and young men’s and women’s access to land. It should be noted these are only correlations and so the reader should be wary not to read too much into any correlation in the data in assigning causation to significant results. Nevertheless, an exploration of correlates to the outcomes most likely affected by the ProPFR interventions provides additional insights on the baseline situation of these four communes of the Borgou and helps consider potential heterogeneous impacts of the programme.

METHODOLOGY

We estimated bivariate and multivariate linear probability models of these main outcomes. Regressions of perceived land insecurity, investments on the plot and agricultural output were conducted at the plot level, while regressions on access to land were conducted at the individual level. All regressions include sampling weights.

Perceived land insecurity corresponds to a binary indicator of reported risk (“rather high” or “high”) of losing the plot. Agricultural investments include indicators for plot fallowing, having undertaken activities to improve soil and water resources conservation¹⁹, having infrastructure on the plot and tree planting. Information on agricultural output is available at the field level but was pooled at the plot level to better explore correlates with plot characteristics. Agricultural productivity is measured as the estimated value of harvests on all fields of the plot per hectare, including primary and secondary crops. Values were estimated using median prices at the village level.²⁰ Women’s and young men’s access to land is defined as being allowed to buy land, by their husband and by their father respectively, and to register it under their name.

The covariates include main land tenure, plot and household characteristics. As measures of land tenure, we consider two main indicators: having a contract, either written or oral, for the plot and physical demarcation of the plot’s borders. We exclude title ownership due to its low occurrence (1.31% of the plots). As a proxy for *de facto* past land security, we include a dummy of occurrence of

¹⁹ These activities include levelling, tree planting, cover crops, strip-cropping, stone barriers, terracing, fertilising crops, fencing, levee, any other activity to enhance soil fertility or to improve soil and water sources conservation.

²⁰ Average crop prices of the main crops produced in the village have been reported in the community survey. Additionally, households were asked to estimate the value of their harvest. When prices are missing at the village level, the median value of these reports has been used.

conflicts on the plot. At the plot level, we look at the gender and literacy of the plot manager. We also include the logarithm of the size of the plot, the minimum distance between the plot and household residence, and how the plot was obtained. When looking at agricultural investments, we additionally consider whether the plot manager ever received credit and perceived land insecurity rather than the occurrence of past land conflicts. When looking at agricultural output, we include these two additional variables in addition to occurrence of past land conflicts, and additionally consider agricultural inputs and investments on the plot. At the household level, we look at the household head's ethnicity and migration status, the household wealth quintile and the commune of residence.

As an alternative to explore the impact of perceived land insecurity on investments on the plot, we estimate a two-stage least squares regression using modes of land acquisition as instrumental variables for land insecurity, following Besley (1995).²¹ Specifically, we consider dummies for whether having been given the land, for having been lent or being renting the land, for being the first occupant and for other modes of acquisition, with having inherited the plot as the excluded reference category. If the method of plot acquisition has no direct effect on investments, this approach addresses the issue of dual causality between land insecurity and investments by isolating the effect of land insecurity on investments.

RESULTS

CORRELATES TO PERCEIVED LAND INSECURITY

Results of bivariate and multivariate OLS regressions of perceived land insecurity are displayed in [Table 113](#) and [Table 114](#). Perceived land insecurity does not differ by gender or literacy of the plot manager. Belonging to minor ethnic groups and being Peulh, in comparison with being Bariba, is correlated with greater land insecurity. Coming from another department and coming from abroad are correlated with an increase in the probability of perceived land insecurity by 13.8 and 20.9 percentage points respectively. However, these correlations are not statistically significant anymore when we control for ethnicity.

Land tenure is significantly correlated with land insecurity. Clearly demarcated borders are associated with a decrease in the probability of land insecurity by 5.6 percentage points. Correlation are stronger with past land conflict, associated with an increase in the probability of land insecurity by 11.9 percentage points and modes of acquisition of the plot, having been given the land being correlated with an increase in the probability of land insecurity by 7.7 percentage points, and borrowing or renting the plot by 32.3 percentage points, all in comparison with having inherited the plot. Land insecurity does not seem to be linked to distance between the plot and household residence.

Even after controlling for household and plot characteristics, perceived land insecurity are respectively 11.4 percentage points and 7.8 percentage points more likely in Kalalé and Sinendé than in Bembéréké.

²¹ Besley Timothy (1995) "Property rights and investment incentives: theory and evidence from Ghana", *The Journal of Political Economy*, 103(5), pp903-937. Besley uses four types of instrumental variables for de facto land rights: whether there is a transfer deed for the field, whether the household has ever litigated over its right to that field, how the field was acquired, and how many years the field has been owned. Our empirical tests led us to conclude that only modes of land acquisition satisfied the requirements of an instrumental variable in our context.

CORRELATES TO INVESTMENTS ON THE PLOT

Results of the second stages of bivariate and multivariate instrumental variable regressions of various investments on the plot are listed in [Table 116](#) and [Table 117](#), and results of the first stage are listed in [Table 115](#). Results of the first stage indicate that how the plot was obtained are strong instrumental variables of perceived land insecurity. Results of the second stages reveal a negative impact of perceived land insecurity on fallowing and tree planting, ranging from a decrease in the probability of fallowing by 20.8 percentage points to that of tree planting by 32.3 percentage points.

Among other covariates, the size of the plot and physical demarcation are the only two variables that are significantly positively correlated with all indicators of investment. In particular, clearly demarcated borders are associated with an increase in the probability of investments on the plot between 5.4 percentage points for fallowing and 22.1 percentage points for soil and water conservation, holding the other covariates fixed. The probability of tree planting decreases with not having a contract for the plot. In line with the results of land insecurity, these results suggest that investments increase with greater land tenure security. Investments do not significantly differ by plot distance.

Women's plots are less likely to have infrastructures and soil and water conservation investments are increasing with household wealth.

Other characteristics are differently correlated to the various investments. Being Peulh is correlated with greater soil and water conservation investments, yet fewer investments in infrastructure and tree planting in comparison with being Bariba. Being Yoruba is also correlated with greater soil and water conservation investments and less investments in infrastructures. The opposite is true for migrants from another village within the department. The four communes display different investment patterns. In comparison with Bembéréké, there is a higher occurrence of investments in soil and water conservation and in tree planting and a lower occurrence of investments in infrastructures in Kalalé, a lower occurrence of investments in fallowing and soil and water conservation but a higher in infrastructures and tree planting in Sinendé, a higher occurrence of investments in fallowing and a lower in infrastructures and soil conservation in Tchaourou.

CORRELATES TO AGRICULTURAL OUTPUT

Results of multivariate OLS regressions of agricultural value per hectare are displayed in [Table 118](#) to [Table 119](#). We first estimated separate multivariate regressions for different groups of covariates, whose results are displayed from column (1) to (6). Hereafter, we comment on the results of the regression including all covariates, displayed in column (7). Agricultural value per hectare does not significantly vary by gender and literacy of the plot manager. In comparison with Bariba, being Peulh is associated with a decrease in value per hectare of 28 percentage points, while being Yoruba is associated with an increase of 83.7 percentage points. Being a migrant from abroad is negatively correlated with value per hectare, while there is no significant effect of household wealth and of having received a credit in the past.

Consistent with previous findings in the literature, our measure of agricultural productivity is negatively correlated with plot size.²² Modes of plot acquisition and indicators of land security are not significantly correlated with value per hectare. As expected, agricultural inputs matter: value per

²² Note that this result may be due to self-reported production being systematically overestimated on small plots and underestimated on larger plots, as demonstrated by Desiere (2018) in the context of Ethiopia.

hectare increases with improved and labour inputs and decreases with manual soil preparation. Among investments on plot, only having infrastructures on the plot is positively correlated with value per hectare. Finally, value per hectare varies substantially across communes, even after controlling for household and plot characteristics, and agricultural inputs. On average, higher value per hectare is found highest in Sinendé and lower in Tchaourou.

CORRELATES TO YOUNG MEN'S AND WOMEN'S ACCESS TO LAND

While residing in Sinendé and Kalalé is associated with a greater access of young men and of women to land, in comparison with Bembéréké, other correlates differ between the two outcomes. Very few variables explain the probability that young men can buy land and register it under their name. This is likely due to low variation in this outcome, with only 11% of young men not having access to land under this definition.

40% of women would not be allowed by their husband to purchase land and register it under their name. Women's household wealth is positively correlated with access to land. Access to land decreases with being Peulh or Yoruba compared to being Bariba. Women appear to enjoy a greater access to land in Tchaourou compared to Bembéréké.

Table 113 - Correlates to Perceived Land Insecurity (Part 1)

VARIABLES	Perceived land insecurity	
	(1) Bivariate regressions	(2) Multivariate regressions
Plot managed by a woman	0.004 (0.035)	-0.015 (0.035)
Literate	0.030* (0.018)	-0.007 (0.018)
Ethnicity (ref:Bariba) = 2, Peulh and related	0.039*** (0.014)	0.033** (0.017)
Ethnicity (ref:Bariba) = 3, Yoruba and related	0.065 (0.042)	0.067 (0.043)
Ethnicity (ref:Bariba) = 4, Other	0.165*** (0.033)	0.085** (0.037)
Migration status = 2, From another village in the commune	0.060 (0.042)	0.026 (0.043)
Migration status = 3, From another village outside the commune	0.052 (0.051)	0.033 (0.052)
Migration status = 4, From another department	0.138*** (0.034)	0.039 (0.037)
Migration status = 5, From abroad	0.209*** (0.070)	0.055 (0.068)
Wealth quartile (all assets) = 2, Second	-0.031 (0.020)	-0.012 (0.020)
Wealth quartile (all assets) = 3, Third	-0.001 (0.025)	0.009 (0.023)
Wealth quartile (all assets) = 4, Highest (richest)	-0.019 (0.022)	-0.000 (0.024)

[CONTINUES ON THE FOLLOWING PAGE]

Table 114 - Correlates to Perceived Land Insecurity (Part 2)

VARIABLES	Perceived land insecurity	
	(1) Bivariate regressions	(2) Multivariate regressions
Size of the plot (log, ha)	-0.012* (0.007)	-0.004 (0.007)
Plot distance	-0.001 (0.001)	0.000 (0.001)
Clearly demarcated borders	-0.057*** (0.016)	-0.056*** (0.016)
No contract	-0.010 (0.019)	0.025 (0.018)
Past land conflict	0.116*** (0.022)	0.119*** (0.021)
How obtained the plot (ref:Inheritance) = 2, Gift	0.088*** (0.021)	0.077*** (0.020)
How obtained the plot (ref:Inheritance) = 3, Loan/Rental	0.337*** (0.061)	0.323*** (0.058)
How obtained the plot (ref:Inheritance) = 4, First occupation	0.016 (0.016)	0.018 (0.017)
How obtained the plot (ref:Inheritance) = 5, Other	0.038 (0.065)	0.046 (0.067)
Commune (ref: Bembereke) = 2, Kalale	0.116*** (0.019)	0.114*** (0.020)
Commune (ref: Bembereke) = 3, Sinende	0.071*** (0.021)	0.078*** (0.021)
Commune (ref: Bembereke) = 4, Tchaourou	0.071*** (0.021)	0.007 (0.021)
<i>Observations</i>	2,692	2,692
<i>R-squared</i>		0.101

Robust standard errors. Regressions include sampling weights.

*** p<0.01, ** p<0.05, * p<0.1

Note: Agricultural plots only. Source: Baseline data.

Table 115 - Correlates to investments, first stage

VARIABLES	Perceived land insecurity	
	(1) Bivariate	(2) Multivariate
Plot was gifted	0.088*** (0.021)	0.071*** (0.020)
Plot is borrowed or rented (ref: Inherited)	0.337*** (0.061)	0.309*** (0.060)
First occupant of the plot (ref: Inherited)	0.016 (0.016)	0.018 (0.017)
Other mode of acquisition (ref: Inherited)	0.038 (0.065)	0.040 (0.062)
Plot managed by a woman		-0.005 (0.037)
Literate		-0.000 (0.019)
Received a loan		-0.005 (0.019)
Ethnicity (ref:Bariba) = 2, Peulh and related		0.026 (0.017)
Ethnicity (ref:Bariba) = 3, Yoruba and related		0.064 (0.042)
Ethnicity (ref:Bariba) = 4, Other		0.091** (0.037)
Migration status = 2, From another village in the commune		0.046 (0.041)
Migration status = 3, From another village outside the commune		0.026 (0.053)
Migration status = 4, From another department		0.044 (0.036)
Migration status = 5, From abroad		0.058 (0.070)
Wealth quartile (all assets) = 2, Second		-0.013 (0.020)
Wealth quartile (all assets) = 3, Third		0.011 (0.024)
Wealth quartile (all assets) = 4, Highest (richest)		0.001 (0.024)
Size of the plot (log, ha)		-0.000 (0.007)
Plot distance		-0.000 (0.001)
Clearly demarcated borders		-0.055*** (0.016)
No contract		0.020 (0.019)
Commune (ref: Bembereke) = 2, Kalale		0.120*** (0.021)
Commune (ref: Bembereke) = 3, Sinende		0.082*** (0.021)
Commune (ref: Bembereke) = 4, Tchaourou		0.024 (0.021)
<i>Observations</i>	2,692	2,692
<i>IV F-Test</i>	11.63	8.998

Two-stage least squares regressions at the plot level with robust standard errors.

*** p<0.01, ** p<0.05, * p<0.1

Note. Agricultural plots only. The way the plot was obtained is used as instrumental variables for land insecurity. Source. Baseline data.

Table 116 - Correlates to investment on the plot (Part 1)

VARIABLES	Following		Soil and water conservation		Infrastructures		Tree planting	
	(1) Bivariate	(2) Multivariate	(3) Bivariate	(4) Multivariate	(5) Bivariate	(6) Multivariate	(7) Bivariate	(8) Multivariate
Perceived land insecurity	-0.134*	-0.208*	-0.368**	0.054	-0.093	-0.046	-0.326***	-0.323**
	(0.079)	(0.109)	(0.180)	(0.187)	(0.135)	(0.141)	(0.126)	(0.164)
Plot managed by a woman		-0.004		0.040		-0.065*		0.032
		(0.039)		(0.054)		(0.038)		(0.051)
Literate		0.021		-0.013		-0.071***		0.008
		(0.017)		(0.027)		(0.020)		(0.023)
Received a loan		0.042**		-0.054**		-0.022		0.016
		(0.019)		(0.025)		(0.020)		(0.025)
Ethnicity (ref:Bariba) = 2, Peulh and related		0.003		0.108***		-0.068***		-0.088***
		(0.018)		(0.028)		(0.025)		(0.024)
Ethnicity (ref:Bariba) = 3, Yoruba and related		-0.010		0.215***		-0.074**		0.000
		(0.047)		(0.058)		(0.031)		(0.054)
Ethnicity (ref:Bariba) = 4, Other		-0.003		-0.077		0.095**		-0.071
		(0.038)		(0.060)		(0.043)		(0.052)
Migration status = 2, From another village in the commune		0.040		-0.061		0.054		0.042
		(0.045)		(0.055)		(0.051)		(0.057)
Migration status = 3, From another village outside the commune		0.026		-0.172***		0.096*		0.058
		(0.048)		(0.058)		(0.056)		(0.064)
Migration status = 4, From another department		-0.018		-0.019		-0.004		0.009
		(0.043)		(0.070)		(0.042)		(0.059)
Migration status = 5, From abroad		0.038		-0.112		-0.043		0.132
		(0.079)		(0.109)		(0.069)		(0.100)

[CONTINUES ON THE FOLLOWING PAGE]

Table 117 - Correlates to investment on the plot (Part 2)

VARIABLES	Following		Soil and water conservation		Infrastructures		Tree planting	
	(1) Bivariate	(2) Multivariate	(3) Bivariate	(4) Multivariate	(5) Bivariate	(6) Multivariate	(7) Bivariate	(8) Multivariate
Wealth quartile (all assets) = 2, Second		-0.049** (0.021)		0.010 (0.029)		0.029 (0.024)		-0.011 (0.025)
Wealth quartile (all assets) = 3, Third		-0.045* (0.023)		0.088*** (0.033)		0.009 (0.026)		0.018 (0.029)
Wealth quartile (all assets) = 4, Highest (richest)		-0.027 (0.025)		0.109*** (0.034)		0.014 (0.028)		0.008 (0.030)
Size of the plot (log, ha)		0.032*** (0.007)		0.032*** (0.011)		0.075*** (0.008)		0.032*** (0.010)
Plot distance		-0.001 (0.001)		-0.002 (0.002)		0.002 (0.001)		0.000 (0.001)
Clearly demarcated borders		0.054*** (0.021)		0.221*** (0.028)		0.130*** (0.026)		0.140*** (0.029)
No contract		0.011 (0.018)		-0.040 (0.026)		-0.023 (0.019)		-0.059** (0.023)
Commune (ref: Bembereke) = 2, Kalale		0.052** (0.020)		0.046 (0.036)		-0.068*** (0.026)		0.181*** (0.029)
Commune (ref: Bembereke) = 3, Sinende		-0.053*** (0.018)		-0.156*** (0.033)		0.204*** (0.032)		0.136*** (0.031)
Commune (ref: Bembereke) = 4, Tchaourou		0.106*** (0.028)		-0.115*** (0.035)		-0.088*** (0.027)		0.040 (0.030)
<i>Observations</i>	2692	2692	2692	2692	2692	2692	2692	2692

Table 118 - Correlates to value per hectare (Part 1)

VARIABLES	Yields (TCFA/ha, log)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Household characteristics							
Plot managed by a woman	-0.023 (0.200)						-0.122 (0.184)
Literate	-0.183 (0.134)						-0.180 (0.125)
Ethnicity (ref:Bariba) = 2, Peulh and rel.	-0.283** (0.131)						-0.280** (0.142)
Ethnicity (ref:Bariba) = 3, Yoruba and rel.	-0.330** (0.144)						0.837*** (0.179)
Ethnicity (ref:Bariba) = 4, Other	0.362 (0.242)						0.225 (0.227)
Migration status = 2, From another village in the commune	0.091 (0.278)						-0.272 (0.261)
Migration status = 3, From another village outside the commune	-0.649*** (0.234)						-0.149 (0.226)
Migration status = 4, From another department	-0.459* (0.244)						0.017 (0.223)
Migration status = 5, From abroad	-0.915** (0.425)						-1.073** (0.494)
Received a loan	0.168 (0.125)						0.179 (0.115)
Wealth quartile (ref:Poorest) = 2, Second	0.074 (0.137)						-0.045 (0.130)
Wealth quartile (ref:Poorest) = 3, Third	0.182 (0.153)						0.182 (0.145)
Wealth quartile (ref:Poorest) = 4, Highest (richest)	0.189 (0.166)						0.063 (0.162)
Plot characteristics							
Size of the plot (log, ha)		0.099** (0.043)					-0.248*** (0.053)
Plot distance		-0.010* (0.006)					-0.004 (0.005)
How obtained the plot (ref:Inheritance) Gift		0.041 (0.105)					0.243* (0.125)
How obtained the plot (ref:Inheritance) Loan/Rental		0.082 (0.290)					0.287 (0.336)
How obtained the plot (ref:Inheritance) First occupation		-0.232** (0.117)					-0.064 (0.128)
How obtained the plot (ref:Inheritance) Other		-0.249 (0.330)					-0.432 (0.287)
Clearly demarcated borders		0.049 (0.116)					-0.031 (0.126)
No contract		0.274*** (0.102)					0.020 (0.117)
<i>[CONTINUES ON THE FOLLOWING PAGE]</i>							

Table 119 - Correlates to value per hectare (Part 2)

VARIABLES	Yields (TCFA/ha, log)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Land security							
Perceived land insecurity			-0.094 (0.100)				-0.115 (0.108)
Land conflict			-0.152				-0.233
Inputs							
Manual soil preparation				-0.808*** (0.097)			-0.672*** (0.120)
Used fertilisers/pesticides/improved seeds				0.617*** (0.107)			0.490*** (0.129)
Labour inputs (Persons-day)				0.000*** (0.000)			0.000*** (0.000)
Investments on plot							
Plot was fallowed in the past					-0.647*** (0.148)		-0.111 (0.160)
Soil and water conservation investments					0.026 (0.094)		0.003 (0.113)
Infrastructures on the plot					0.874*** (0.107)		0.422*** (0.131)
Tree planting					-0.034 (0.121)		-0.067 (0.133)
Commune							
Commune (ref: Bembereke) = 2, Kalale						-0.687*** (0.107)	-0.534*** (0.131)
Commune (ref: Bembereke) = 3, Sinende						0.947*** (0.133)	0.866*** (0.167)
Commune (ref: Bembereke) = 4, Tchaourou						-0.581*** (0.100)	-0.791*** (0.176)
<i>Observations</i>	2,541	3,227	3,370	3,370	3,370	3,370	2,437
<i>R-squared</i>	0.012	0.007	0.001	0.063	0.030	0.071	0.141

Robust standard errors. Regressions include sampling weights.

*** p<0.01, ** p<0.05, * p<0.1

Note: Agricultural plots only. Source: Baseline data.

Table 120 - Correlates to Women's and Young men's access to land

VARIABLES	Young men's access to land		Women's access to land	
	(1) Bivariate	(2) Multivariate	(3) Bivariate	(4) Multivariate
Literate	0.018 (0.030)	0.010 (0.040)	0.126*** (0.037)	0.009 (0.045)
Ethnicity (ref:Bariba) = 2, Peulh and related	-0.007 (0.033)	-0.058 (0.047)	-0.259*** (0.023)	-0.130*** (0.032)
Ethnicity (ref:Bariba) = 3, Yoruba and related	0.041 (0.056)	-0.014 (0.081)	-0.024 (0.048)	-0.107* (0.057)
Ethnicity (ref:Bariba) = 4, Other	0.042 (0.048)	-0.020 (0.071)	0.011 (0.035)	-0.005 (0.042)
Wealth quintile (ref:Very poor) = 2, Poor	0.032 (0.048)	0.018 (0.050)	0.149*** (0.037)	0.117*** (0.036)
Wealth quintile (ref:Very poor) = 3, Rich	0.006 (0.051)	-0.015 (0.053)	0.199*** (0.036)	0.111*** (0.038)
Wealth quintile (ref:Very poor) = 4, Very rich	-0.051 (0.057)	-0.076 (0.059)	0.311*** (0.033)	0.218*** (0.036)
Commune (ref: Bembereke) = 2, Kalale	0.111*** (0.035)	0.136*** (0.043)	0.010 (0.029)	0.063* (0.034)
Commune (ref: Bembereke) = 3, Sinende	0.109*** (0.037)	0.109** (0.044)	0.160*** (0.028)	0.178*** (0.033)
Commune (ref: Bembereke) = 4, Tchaourou	0.099** (0.043)	0.104 (0.072)	0.295*** (0.029)	0.264*** (0.037)
<i>Observations</i>	517	517	1,902	1,902
<i>R-squared</i>	0.010	0.046		0.123

Robust standard errors. Regressions include sampling weights.

*** p<0.01, ** p<0.05, * p<0.1

Source. Baseline data.

5.13. POWER CALCULATIONS

When planning for an impact evaluation, it is important to calculate the necessary sample size to estimate effects of a given intervention. The more data is available, the smaller will be the minimum detectable effect size (MDES) that can be statistically said to be significantly different from zero. Ideally, this should be as small as possible, as any difference between treatment and control groups smaller than this MDES cannot be distinguished from finding no effect (the “null hypothesis”). Prior to collecting baseline data, rough sample sizes required to find a feasible MDES are established, but more realistic MDES calculations can be made using data collected at baseline from the actual sample used in an impact evaluation. Based on baseline data, the power calculations have been reviewed for various potential outcomes of interest. Results are listed in [Table 121](#) and [Table 122](#) and present estimates of the MDESs considering available information.

As indicators of the project activities, we consider demarcation of the borders of agricultural plots. As outputs, we look at title ownership, having experienced a conflict since 2017, not fearing losing land, not fearing losing land if left unoccupied, reporting no risk of losing land rights, and having obtained credit. As outcomes, we focus on several agricultural inputs (manual labour, the use of improved inputs including fertilisers, improved seeds and pesticides, and total labour inputs),

investments on the plot (fallowing, improved water supply, soil and water conservation measures, tree planting, having infrastructure on the plot and having invested in these infrastructures over the last year), and indicators of women’s and young men’s land rights (notably, decision-making over plots, access to land and opinions on land rights). Finally, as impact indicators, we consider the estimated value of the harvest, yields, share of sales in total production and indicators of food insecurity.

The MDES is calculated with the following formula:

$$MDES = (t_{1-\kappa} + t_{\alpha}) \sqrt{\frac{1}{P(1-P)}} \sqrt{1 + \rho(m-1)} \sqrt{\frac{\sigma^2}{N}}$$

where $t_{1-\kappa}$ and t_{α} are t-statistics representing the required power and level of statistical significance, P represents the proportion in one of the two compared groups (allocation ratio), ρ is the intra-cluster correlation (ICC), m is the average number of observations per cluster (rounded down for this exercise), σ^2 is the variance of the outcome of interest within our population, N is the total sample size, defined as the average number of observations times the number of clusters.

The project being implemented at the village level, we considered a clustered design made of 54 villages (27 treated and 27 control). Depending on the outcome of interest, observations correspond to households, individuals, plots or fields, affecting the total sample size. The MDES were estimated for a power of 80% and a level of statistical significance of 5%. MDES are presented both in absolute and standardized value.

As noted in the concept note, due to the low number of available villages, we will not be able to detect changes in some of these outcomes. Regarding the very low reported number of recent land conflicts in our dataset (10% at baseline), a decrease in land conflict of at least 6 percentage points is unlikely to be observed. This corresponds to a decrease in conflict by 60%, which is beyond what can be expected of the ProPFR within a relatively short time period. The inverse is true – namely that it takes a high value - for the fear of losing land if it is left unoccupied (90% at baseline). This means that we need an increase of at least 8 percentage points to find a significant result, which would take the endline value to an unrealistic value of 98% not fearing losing their land. Rather large changes would be needed to observe effects on manual labour (a change of more than 29%), investments in soil and water sources conservation (above 36%), infrastructures on the plot (above 50%), young men’s land rights, married women’s access to land (above 25%) and having fewer than 3 meals a day (above 56%).

We are more likely to observe impacts for variables such as demarcation, which start at relatively low levels (12% of plots are demarcated), meaning that a 9 percentage point rise would be sufficient to statistically show an impact of the ProPFR. A 3 percentage point rise in document ownership would also be sufficient to find an effect of the programme while the overall perception of risk (that is feeling there is no risk of losing land) should improve by 11 percentage points.

Table 121 - Power calculation MDEs (part 1)

Variable	Sample size	Baseline level	Baseline standard deviation	Intra-Cluster Correlation	Minimum Detectable Effect Size (absolute value)	MDES (standardized)
Activities						
Demarcation	3942	0,12	0,33	0,13	0,09	0,27
Outputs						
Title ownership (agricultural plot)	3942	0,01	0,11	0,14	0,03	0,27
Recent land conflict	3942	0,1	0,33	0,04	0,06	0,18
No fear of losing land	3942	0,58	0,49	0,08	0,12	0,24
No fear of losing land if left unoccupied	3942	0,9	0,3	0,09	0,08	0,27
Perceived land security (no risk)	3726	0,68	0,47	0,09	0,12	0,26
Credit access	8910	0,12	0,33	0,07	0,1	0,30
Outcomes: agricultural inputs						
Manual labour	6534	0,63	0,48	0,23	0,18	0,38
Improved inputs	6534	0,7	0,46	0,09	0,11	0,24
Total labor inputs (persons*days)	6210	1027,56	2049,59	0,08	472,1	0,23
Outcomes: investments on the plot						
Following	3942	0,11	0,31	0,06	0,06	0,19
Improved water supply	3942	0,02	0,14	0,03	0,02	0,14
Soil and water sources conservation	3942	0,39	0,49	0,12	0,14	0,29
Tree planting	3942	0,16	0,37	0,07	0,08	0,22
Infrastructures on the plot	3942	0,22	0,41	0,1	0,11	0,27
Investment in these infrastructures in the last year	864	0,16	0,37	0,07	0,1	0,27

Table 122 - Power calculation MDEs (part 2)

Variable	Sample size	Baseline level	Baseline standard deviation	Intra-Cluster Correlation	Minimum Detectable Effect Size (absolute value)	MDES (standardized)
Outcomes: Young men's land rights						
Decides on which plot to work	648	0,17	0,37	0,07	0,11	0,30
Can use HH labor or equipment	270	0,76	0,43	0,25	0,21	0,49
Decides on how to use the harvest	270	0,65	0,48	0,17	0,22	0,46
Can buy land and register it under his name	648	0,89	0,31	0,13	0,11	0,35
Index on negative opinions on young men's land rights*	648	-0,21	0,88	0,09	0,28	0,32
Outcomes: Women's land rights						
Decides on which plot to work	2646	0,16	0,37	0,06	0,08	0,22
Keeps some land in case of separation	2376	0,11	0,31	0,05	0,06	0,19
Can buy land and register it under her name	2646	0,6	0,49	0,14	0,15	0,31
Index on negative opinions on women's land rights*	2646	-0,3	1,04	0,23	0,4	0,38
Impact indicators						
Estimated value of the harvest (HH estimation, in TCFA)	1728	3674,54	51427,35	0	7064,01	0,14
Yield (HH estimation, TCFA/ha)	1674	1511,59	19272,88	0	2720,99	0,14
Share of sales in total production	2538	0,62	0,29	0,14	0,09	0,31
Worried about lacking food (last 7 days)	2916	0,11	0,31	0,05	0,06	0,19
Lacked food (last 12 months)	2916	0,13	0,33	0,04	0,06	0,18
Turned to food coping strategies	2916	0,53	0,5	0,03	0,09	0,18
Less than 3 meals a day	2916	0,18	0,38	0,1	0,1	0,26

*Inverse covariance weighted indexes (Anderson, 2008) using categorical variables on land rights, ranging from no restriction (1) to no right (3).

6. CONCLUSIONS & RECOMMENDATIONS

6.1 SUMMARY OF THE BASELINE FINDINGS

Our data allow us to gain a better understanding of the households in the Borgou department who stand to gain from the ProPFR programme. As expected, the majority of households are farmers and, in our data, own or work on an average of 1.3 parcels per household. The communes show some heterogeneity in their socioeconomic characteristics such as assets and ethnicities present. Tchaourou differs substantially from the 3 communes in the north as one would expect given the distance between them. This helps substantiate the claim that villages closer to one another are more similar and so comparable, used in our sampling strategy.

Part of the ProPFR aims at enabling women's rights to be secured in a context where most households are headed by men and where women's rights over land are fairly weak. The proportion of women who believe they would keep some land if they were to separate is rather low, with almost 90% stating they would keep no land in the case of separation. Women do seem to have some autonomy, as they mostly claim that if they had money, they would be allowed to purchase land and that their name would be on the title deed. Young men are also thought to lack the bargaining power to keep working on the same land and plan for the long term, but this seems to be much less of an issue than for women.

Before the land plans of the PFR are drawn up, awareness campaigns and information will first be spread. The current state of knowledge in the area of land rights is poor with only 21% of respondents aware that a new land code has been introduced. However, this varies by commune and households in some villages even claim to have benefited from a PFR already. In particular, Bouratébé stands out not only in the self-reported responses about the PFR but also about plot measurement.

In general, land is gained through inheritance, gifts and by occupying a previously unused parcel. The market for land – especially agricultural parcels – is not very active. The traditional authorities are still the most important in land management decisions and conflict resolution, with 79% of villages responding that the village council are engaged in land management.

Conflict poses a threat for respondents, with 20% of plots having been the subject of conflict. These conflicts are most commonly solved by the village chief, reinforcing the impression that the villages in Borgou still for the most part make use of traditional institutions. The most common conflicts are indeed between farmers and herders, as was identified in the planning of the ProPFR project. Those working in agriculture also tend to use traditional techniques, with low ownership of more advanced capital to work their land and low usage rates of improved seeds.

6.2 PRELIMINARY LESSONS LEARNED AND RECOMMENDATIONS

Very little land is registered currently, which should change appreciably through the work carried out as part of the ProPFR. Households seem to be interested in documentation for land and claim to be willing to pay for a certificate for non-agricultural land. We do not have information on the willingness to pay for documentation for agricultural land. The GIZ team has, however, established contact with a local university in Parakou which is involved in surveys and potential experiments to investigate the willingness to pay for documents for agricultural land. This work may complement our own.

The ProPFR programme appears to be well targeted to help alleviate some of the issues of conflict between herders and farmers. The “Couloirs de passage” (cattle driving corridors) can help reduce the level of conflict if rights are clearly defined where the livestock of the herders can move. Discussions held with participants of the dissemination session held in N’Dali suggest that the couloirs are not always well respected and that conflicts between farmers and herder are, if anything, becoming more common. This seems to be a key issue facing the region in terms of conflicts and knowledge of rights and the documentation of which land can be used may help address this problem.

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APPENDICES

APPENDIX 1: BALANCE TABLES

Table A - 1: Balance on Sociodemographic Characteristics (Part 1)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1455 Mean/SE	Control villages N=1513 Mean/SE	
Male	0.912 [0.015]	0.884 [0.013]	0.028
Age	45.635 [0.353]	45.790 [0.497]	-0.155
Marital status			
Single	0.042 [0.007]	0.043 [0.007]	-0.001
Married with 1 woman	0.649 [0.019]	0.605 [0.025]	0.044
Married with 2 women	0.170 [0.024]	0.191 [0.018]	-0.021
Married with 3 women or more	0.045 [0.006]	0.038 [0.004]	0.007
Divorced / Separated	0.028 [0.005]	0.040 [0.006]	-0.011
Widow	0.054 [0.007]	0.078 [0.011]	-0.024*
Free union	0.012 [0.005]	0.005 [0.002]	0.007
Highest education level			
Preschool	0.000 [0.000]	0.000 [0.000]	0.000
Primary school	0.098 [0.013]	0.114 [0.027]	-0.015
Secondary school	0.071 [0.010]	0.076 [0.018]	-0.004
High school	0.026 [0.006]	0.024 [0.006]	0.002
Tertiary education	0.010 [0.003]	0.008 [0.002]	0.001
Coranic school	0.002 [0.001]	0.000 [0.000]	0.002*
None	0.792 [0.019]	0.777 [0.047]	0.014
Other	0.000 [0.000]	0.001 [0.001]	-0.000

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 2: Balance on Sociodemographic Characteristics (Part 2)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1455 Mean/SE	Control villages N=1513 Mean/SE	
Number of household members	6.075 [0.329]	5.839 [0.247]	0.236
Ethnicity			
Bariba and related	0.395 [0.069]	0.334 [0.074]	0.061
Peulh and related	0.396 [0.069]	0.433 [0.092]	-0.037
Yoruba and related	0.067 [0.036]	0.131 [0.090]	-0.064
Other	0.141 [0.038]	0.102 [0.022]	0.039
Religion			
Traditional (animiste / vodoun)	0.034 [0.008]	0.017 [0.006]	0.017
Christian	0.286 [0.039]	0.234 [0.045]	0.052
Islam	0.645 [0.045]	0.725 [0.046]	-0.080
No religion	0.026 [0.007]	0.016 [0.005]	0.010
Other religion	0.009 [0.004]	0.008 [0.005]	0.001

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 3: Balance on Economic Status

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
Main employment of the HHH	N=1447	N=1503	
Farmer/Worker in the family farm	0.767 [0.020]	0.729 [0.025]	0.038
Business/Merchant	0.067 [0.013]	0.077 [0.017]	-0.010
Other	0.119 [0.012]	0.136 [0.021]	-0.018
Does not work	0.048 [0.009]	0.057 [0.009]	-0.009
Monthly income (first employment)	N=1453	N=1510	
	782.055 [89.951]	670.955 [111.139]	111.101
House ownership	0.734 [0.027]	0.685 [0.025]	0.049
Wealth index	N=1049	N=1040	
Very poor	0.273 [0.040]	0.240 [0.057]	0.034
Poor	0.259 [0.022]	0.251 [0.025]	0.008
Rich	0.230 [0.022]	0.256 [0.028]	-0.027
Very rich	0.239 [0.033]	0.253 [0.037]	-0.015

The wealth index is based on agricultural and non-agricultural assets ownership, livestock, dwelling characteristics, source of drinking water and access to electricity. The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 4: Balance on Land Ownership and Transactions

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
Non-agricultural plots			
Average number of plots	N=1096 1.071 [0.018]	N=1088 1.097 [0.021]	-0.026
Plots characteristics			
Average size (in Hectares)	N=1000 5.838 [2.533]	N=967 6.989 [3.494]	-1.151
Plot is in the village	N=1180 0.945 [0.015]	N=1211 0.929 [0.015]	0.016
Main use is personal housing	0.938 [0.011]	0.930 [0.025]	0.008
Agricultural plots			
Average number of plots	N=1455 1.308 [0.089]	N=1513 1.330 [0.058]	-0.022
Plots characteristics			
Average size (in Hectares)	N=1817 6.084 [0.532]	N=1958 37.354 [32.464]	-31.270
Plot is in the village	N=1908 0.975 [0.006]	N=2055 0.983 [0.004]	-0.008
Main use is cultivation	0.989 [0.003]	0.984 [0.004]	0.005
Borders are clearly marked	0.185 [0.036]	0.229 [0.032]	-0.044
Land transactions			
Any land has been gifted	0.059 [0.012]	0.051 [0.011]	0.007
Any land has been sold	0.003 [0.001]	0.004 [0.002]	-0.001
Any land has been lost	0.058 [0.010]	0.032 [0.007]	0.026**

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 5: Balance on Land Conflict

	Treatment status		
	(1)	(2)	Difference t-test
	ProPFR villages N=1908	Control villages N=2055	
	Mean/SE	Mean/SE	(1)-(2)
A conflict occurred	0.210 [0.026]	0.247 [0.027]	-0.037
Any of these land related issues occurred			
Boudaries contestation / infringement	0.086 [0.013]	0.108 [0.016]	-0.021
Conflict between farmers and breeders	0.130 [0.031]	0.155 [0.036]	-0.025
Boudaries with the State's properties	0.014 [0.005]	0.006 [0.003]	0.008
Inheritance contestation	0.020 [0.006]	0.016 [0.004]	0.004
Fraudulent sale	0.000 [0.000]	0.003 [0.003]	-0.003
Non-consensual contract breach	0.004 [0.002]	0.003 [0.001]	0.001
Other conflict related to property rights	0.015 [0.004]	0.009 [0.004]	0.007
Other problem / conflict	0.004 [0.002]	0.003 [0.002]	0.001
With who the last conflict occurred:			
A household member	N=364 0.017 [0.008]	N=442 0.011 [0.005]	0.006
The owner (outside the HH)	0.049 [0.016]	0.072 [0.026]	-0.023
Another family / household	0.184 [0.038]	0.182 [0.054]	0.002
Household head (outside the HH)	0.018 [0.009]	0.015 [0.007]	0.003
Another family member (outside the	0.089 [0.026]	0.103 [0.024]	-0.014
A community elder	0.074 [0.012]	0.042 [0.016]	0.033
Another village member	0.319 [0.044]	0.310 [0.063]	0.009
Someone outside the village	0.183 [0.042]	0.079 [0.031]	0.104**
Agricultural group / cooperative	0.013 [0.007]	0.002 [0.002]	0.011
Administrative authority	0.039 [0.014]	0.011 [0.005]	0.028*
Other	0.014 [0.006]	0.173 [0.072]	-0.160**

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 6: Balance on the perception of land security

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=1790 Mean/SE	(2) Control villages N=1941 Mean/SE	
<hr/>			
Perceived the risk of losing rights over this plot in the 5 next years:			
Not at all	0.722 [0.026]	0.748 [0.031]	-0.026
Rather unlikely	0.166 [0.020]	0.104 [0.025]	0.062*
Rather likely	0.045 [0.007]	0.062 [0.013]	-0.018
Very likely	0.067 [0.010]	0.086 [0.018]	-0.019
<hr/>			
Fear of losing land:	N=1908	N=2055	
Reallocation of the plot	0.152 [0.024]	0.104 [0.018]	0.048
Occupation by someone else	0.115 [0.014]	0.139 [0.020]	-0.024
Infringement	0.110 [0.018]	0.067 [0.019]	0.043
Risk of conflict	0.054 [0.009]	0.057 [0.013]	-0.003
Loss of documents	0.008 [0.003]	0.003 [0.002]	0.005
Nothing	0.545 [0.021]	0.615 [0.028]	-0.070**
Other	0.015 [0.007]	0.014 [0.004]	0.002
<hr/>			
Non-HH members take ressources from the plot	0.585 [0.032]	0.596 [0.055]	-0.012

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

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Table A - 7: Balance on Non-Agricultural Land Acquisition and Rights

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1180 Mean/SE	Control villages N=1211 Mean/SE	
Mode of acquisition of the non-agricultural plot:			
Inheritance	0.311 [0.029]	0.448 [0.033]	-0.137***
Gift	0.344 [0.054]	0.248 [0.019]	0.096*
Loaned	0.007 [0.005]	0.008 [0.004]	-0.001
Rental	0.001 [0.001]	0.004 [0.003]	-0.003
Purchase	0.041 [0.010]	0.069 [0.015]	-0.029
Appropriation / First occupation	0.281 [0.039]	0.213 [0.027]	0.068
Other	0.015 [0.004]	0.009 [0.003]	0.006
Ownership title	0.048 [0.010]	0.073 [0.015]	-0.025
Reason for not having a title:			
Unsolved land conflict	0.002 [0.001]	0.003 [0.002]	-0.002
Dangerous plot / Non-constructable	0.000 [0.000]	0.000 [0.000]	-0.000
Too expensive	0.020 [0.006]	0.031 [0.011]	-0.010
Not ready	0.175 [0.031]	0.161 [0.029]	0.014
Not collected	0.004 [0.002]	0.004 [0.003]	-0.000
Not available	0.537 [0.034]	0.446 [0.068]	0.091
Lost / stolen	0.000 [0.000]	0.002 [0.002]	-0.002
Other	0.261 [0.037]	0.352 [0.052]	-0.090
Would like to obtain a title	0.849 [0.021]	0.836 [0.024]	0.013
Willingness to pay for a title			
	0.874 [0.033]	0.866 [0.032]	0.009
Amount willing to pay for a title (in TCFA)	82.387 [26.932]	80.109 [56.112]	2.279

The value displayed for t-tests are the differences in the means across the groups.
Standard errors are clustered at the village

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 8: Balance on Agricultural Land Acquisition and Rights

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR N=1908 Mean/SE	(2) Control N=2055 Mean/SE	
Mode of acquisition of the agricultural plot:			
Inheritance	0.371 [0.041]	0.421 [0.029]	-0.050
Gift	0.331 [0.059]	0.290 [0.025]	0.040
Loaned	0.034 [0.009]	0.038 [0.010]	-0.004
Rental	0.005 [0.002]	0.009 [0.009]	-0.005
Purchase	0.004 [0.001]	0.005 [0.002]	-0.001
Appropriation / First occupation	0.246 [0.036]	0.230 [0.033]	0.016
Other	0.009 [0.002]	0.006 [0.003]	0.003
Ownership title	0.008 [0.004]	0.010 [0.007]	-0.002
Reason for not having a title:			
Unsolved land conflict	0.001 [0.001]	0.001 [0.001]	0.000
Dangerous plot / Non-constructable	0.000 [0.000]	0.002 [0.001]	-0.001
Too expensive	0.023 [0.007]	0.021 [0.008]	0.002
Not ready	0.170 [0.029]	0.128 [0.030]	0.042
Not collected	0.010 [0.003]	0.004 [0.002]	0.006
Not available	0.522 [0.039]	0.469 [0.064]	0.052
Lost / stolen	0.054 [0.013]	0.100 [0.019]	-0.045*
Lack of information	0.142 [0.043]	0.121 [0.037]	0.021
Judged unnecessary	0.052 [0.020]	0.054 [0.014]	-0.001
Does not own the plot	0.013 [0.006]	0.070 [0.031]	-0.057*
Other	0.013 [0.004]	0.031 [0.009]	-0.018*

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 9: Balance on Village Land Structures

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=25 Mean/SE	(2) Control villages N=28 Mean/SE	
Any village structure for land affairs	0.923 [0.053]	0.741 [0.086]	0.182*
Is there a Section Villageoise de Gestion Foncière	N=24 0.625 [0.101]	N=20 0.400 [0.112]	0.225
Is there a Comité Villageois de Gestion Foncière	0.292 [0.095]	0.300 [0.105]	-0.008
The village council is concerned with land affairs	0.917 [0.058]	1.000 [0.000]	-0.083
Is there an elders council	0.833 [0.078]	0.850 [0.082]	-0.017
The elders council is concerned with land affairs	0.950 [0.050]	1.000 [0.000]	-0.050
Other structure concerned with land affairs	0.083 [0.058]	0.100 [0.069]	-0.017
<u>The following structures are involved in land affairs:</u>	N=26	N=27	
Comité de Gestion Foncière	0.385 [0.097]	0.333 [0.092]	0.051
Tribunal	0.200 [0.082]	0.074 [0.051]	0.126
Department of land affairs	0.615 [0.097]	0.296 [0.090]	0.319**
Police (Brigade de Gendarmerie)	0.462 [0.100]	0.259 [0.086]	0.202
District council	0.800 [0.082]	0.667 [0.092]	0.133

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

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Table A - 10: Balance on Village Land Structure Uses (Part 1)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=25 Mean/SE	Control villages N=23 Mean/SE	
Main structure for land allocation			
Section Villageoise de Gestion Foncière	0.160 [0.075]	0.043 [0.043]	0.117
Village council	0.320 [0.095]	0.522 [0.106]	-0.202
Elders council	0.320 [0.095]	0.130 [0.072]	0.190
District council	0.080 [0.055]	0.174 [0.081]	-0.094
Other	0.120 [0.066]	0.130 [0.072]	-0.010
Main structure to help with land acquisition			
Section Villageoise de Gestion Foncière	0.240 [0.087]	0.130 [0.072]	0.110
Village council	0.360 [0.098]	0.435 [0.106]	-0.075
Elders council	0.320 [0.095]	0.174 [0.081]	0.146
District council	0.000 [0.000]	0.130 [0.072]	-0.130*
Other	0.080 [0.055]	0.130 [0.072]	-0.050
Main structure to approve land transfers or sales			
Section Villageoise de Gestion Foncière	0.200 [0.082]	0.087 [0.060]	0.113
Village council	0.360 [0.098]	0.478 [0.106]	-0.118
Elders council	0.240 [0.087]	0.130 [0.072]	0.110
District council	0.120 [0.066]	0.174 [0.081]	-0.054
Other	0.080 [0.055]	0.130 [0.072]	-0.050
Main structure to plan land use			
Section Villageoise de Gestion Foncière	0.240 [0.087]	0.087 [0.060]	0.153
Village council	0.320 [0.095]	0.522 [0.106]	-0.202
Elders council	0.320 [0.095]	0.174 [0.081]	0.146
District council	0.040 [0.040]	0.130 [0.072]	-0.090
Other	0.080 [0.055]	0.087 [0.060]	-0.007

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 11: Balance on Village Land Structure Uses (Part 2)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=25 Mean/SE	Control villages N=23 Mean/SE	
Main structure to mediate conflicts			
Section Villageoise de Gestion Foncière	0.200 [0.082]	0.087 [0.060]	0.113
Village council	0.240 [0.087]	0.522 [0.106]	-0.282**
Elders council	0.360 [0.098]	0.130 [0.072]	0.230*
District council	0.080 [0.055]	0.174 [0.081]	-0.094
Other	0.120 [0.066]	0.087 [0.060]	0.033
Main structure to set up the PFR			
Section Villageoise de Gestion Foncière	0.292 [0.095]	0.174 [0.081]	0.118
Village council	0.167 [0.078]	0.348 [0.102]	-0.181
Elders council	0.250 [0.090]	0.043 [0.043]	0.207**
District council	0.083 [0.058]	0.217 [0.088]	-0.134
Other	0.208 [0.085]	0.217 [0.088]	-0.009
Main structure to raise awareness on the PFR			
Section Villageoise de Gestion Foncière	0.292 [0.095]	0.174 [0.081]	0.118
Village council	0.250 [0.090]	0.391 [0.104]	-0.141
Elders council	0.125 [0.069]	0.043 [0.043]	0.082
District council	0.042 [0.042]	0.261 [0.094]	-0.219**
Other	0.292 [0.095]	0.130 [0.072]	0.161

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Main structure to collect taxes			
Section Villageoise de Gestion Foncière	0.240 [0.087]	0.087 [0.060]	0.153
Village council	0.200 [0.082]	0.174 [0.081]	0.026
Elders council	0.200 [0.082]	0.130 [0.072]	0.070
Department of land affairs	0.160 [0.075]	0.435 [0.106]	-0.275**
Other	0.200 [0.082]	0.174 [0.081]	0.026
Main structure to keep maps			
Section Villageoise de Gestion Foncière	0.160 [0.075]	0.087 [0.060]	0.073
Village council	0.440 [0.101]	0.348 [0.102]	0.092
Elders council	0.080 [0.055]	0.130 [0.072]	-0.050
Department of land affairs	0.160 [0.075]	0.217 [0.088]	-0.057
Other	0.160 [0.075]	0.217 [0.088]	-0.057

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 12: Balance on Awareness of PFR (Part 1)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
	N=1455	N=1513	
Heard about the new Code Foncier et Dominal	0.206 [0.027]	0.195 [0.026]	0.011
Source of information:	N=289	N=338	
Radio	0.760 [0.041]	0.761 [0.038]	-0.001
Television	0.039 [0.017]	0.009 [0.006]	0.030*
A friend	0.085 [0.022]	0.136 [0.029]	-0.051
A NGO	0.025 [0.011]	0.023 [0.013]	0.001
A village association	0.059 [0.018]	0.023 [0.008]	0.036*
Other	0.032 [0.014]	0.048 [0.016]	-0.015
	N=1455	N=1513	
Heard about PFR or ADC	0.281 [0.030]	0.203 [0.032]	0.078*
Heard about PFR or ADC in the media:	N=372	N=308	
Yes, at the radio	0.654 [0.078]	0.432 [0.060]	0.221**
Yes, on TV	0.012 [0.007]	0.011 [0.006]	0.001
Yes, both at the radio and on TV	0.005 [0.004]	0.001 [0.001]	0.003
No	0.330 [0.078]	0.555 [0.062]	-0.226**

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 13: Balance on Awareness of PFR (Part 2)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
Information meetings about ADC:	N=372	N=308	
Yes, in my village	0.385 [0.057]	0.244 [0.059]	0.140*
Yes, in another village	0.086 [0.018]	0.053 [0.011]	0.033
No	0.529 [0.067]	0.703 [0.059]	-0.173*
Participation in these meetings:	N=166	N=112	
Yes, in my village	0.446 [0.062]	0.469 [0.074]	-0.023
Yes, in another village	0.074 [0.020]	0.128 [0.043]	-0.053
No	0.480 [0.064]	0.404 [0.088]	0.076
Reason for not participating:	N=85	N=47	
No assemblee	0.072 [0.033]	0.136 [0.045]	-0.063
Too far	0.081 [0.046]	0.143 [0.061]	-0.063
Did not know	0.461 [0.049]	0.533 [0.102]	-0.073
Not welcomed / invited	0.219 [0.073]	0.032 [0.025]	0.187**
Useless	0.021 [0.017]	0.000 [0.000]	0.021
Disagree with these assemblees	0.036 [0.018]	0.000 [0.000]	0.036**
Other	0.110 [0.065]	0.156 [0.060]	-0.046
Village is or was subject to a PFR	0.522 [0.084]	0.200 [0.056]	0.322***

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 14: Balance on Opinions on Land Registration

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR N=1455 Mean/SE	Control N=1513 Mean/SE	
<i>What is the impact of the measurement and registration of your plot on:</i>			
Conflicts			
Decreases conflict	0.933 [0.017]	0.926 [0.030]	0.007
Increases conflict	0.027 [0.007]	0.013 [0.004]	0.014*
No impact	0.041 [0.014]	0.061 [0.029]	-0.021
Loss of the plot			
Easier	0.434 [0.047]	0.453 [0.024]	-0.019
Harder	0.530 [0.051]	0.491 [0.027]	0.039
No impact	0.036 [0.013]	0.056 [0.027]	-0.020
Compensation when losing a plot			
Easier	0.831 [0.020]	0.793 [0.033]	0.038
Harder	0.130 [0.019]	0.142 [0.030]	-0.012
No impact	0.039 [0.013]	0.065 [0.031]	-0.026
Borrowing money			
Easier	0.901 [0.021]	0.852 [0.037]	0.049
Harder	0.023 [0.004]	0.043 [0.012]	-0.020
No impact	0.076 [0.020]	0.105 [0.035]	-0.029
Investment on the plot			
Increases	0.936 [0.015]	0.912 [0.027]	0.023
Decreases	0.034 [0.008]	0.017 [0.004]	0.017*
No effect	0.030 [0.013]	0.071 [0.026]	-0.040
Lending plots and gifts			
Easier	0.863 [0.020]	0.807 [0.030]	0.055
Harder	0.088 [0.013]	0.104 [0.015]	-0.016
No impact	0.049 [0.014]	0.088 [0.030]	-0.039
Inheritance			
Easier	0.916 [0.016]	0.875 [0.037]	0.041
Harder	0.044 [0.011]	0.051 [0.016]	-0.007
No impact	0.040 [0.013]	0.074 [0.030]	-0.034

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Impact Evaluation of ProPFR – Baseline Report

<u>Rental / sharecropping</u>			
Easier	0.817 [0.024]	0.770 [0.040]	0.047
Harder	0.112 [0.021]	0.121 [0.024]	-0.009
No impact	0.071 [0.017]	0.109 [0.030]	-0.038
<u>Purchases / sales</u>			
Easier	0.837 [0.017]	0.791 [0.035]	0.047
Harder	0.100 [0.018]	0.085 [0.017]	0.016
No impact	0.063 [0.017]	0.125 [0.027]	-0.062*
<u>Land owners' rights</u>			
More secured	0.927 [0.017]	0.921 [0.024]	0.006
More limited	0.046 [0.014]	0.027 [0.006]	0.019
No impact	0.027 [0.011]	0.052 [0.023]	-0.025
<u>Tenants' and sharecroppers' rights</u>			
More secured	0.812 [0.033]	0.719 [0.042]	0.092*
More limited	0.143 [0.035]	0.201 [0.038]	-0.058
No impact	0.045 [0.014]	0.080 [0.029]	-0.035
<u>Women's land rights</u>			
More secured	0.841 [0.019]	0.800 [0.041]	0.041
More limited	0.072 [0.015]	0.087 [0.019]	-0.014
No impact	0.087 [0.023]	0.113 [0.032]	-0.027
<u>Herders' land rights</u>			
More secured	0.716 [0.030]	0.644 [0.055]	0.072
More limited	0.237 [0.031]	0.251 [0.045]	-0.014
No impact	0.047 [0.013]	0.105 [0.023]	-0.058**
<u>Foreigners' land rights</u>			
More secured	0.723 [0.029]	0.702 [0.045]	0.022
More limited	0.243 [0.030]	0.212 [0.033]	0.030
No impact	0.034 [0.010]	0.086 [0.030]	-0.052*
<u>Sales of land</u>			
Increase	0.705 [0.030]	0.767 [0.050]	-0.062
Decrease	0.184 [0.026]	0.132 [0.033]	0.053
No impact	0.111 [0.020]	0.101 [0.028]	0.010

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 15: Balance on Access to Credit

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
	N=4296	N=4629	
Ever asked for a loan	0.157 [0.023]	0.121 [0.020]	0.036
Ever obtained a loan	N=624 0.976 [0.011]	N=506 0.987 [0.006]	-0.011
Amount of money borrowed	N=609 183.469 [19.232]	N=497 554.208 [323.628]	-370.738
<u>Requested documents (last loan obtained)</u>			
Titre foncier	0.011 [0.005]	0.002 [0.002]	0.009*
Certificat foncier rural	0.000 [0.000]	0.000 [0.000]	N/A
Attestation de détention coutumière (ADC)	0.002 [0.002]	0.000 [0.000]	0.002
Bail de location	0.002 [0.002]	0.000 [0.000]	0.002
Permis d'habiter	0.000 [0.000]	0.003 [0.003]	-0.003
Convention de vente certifiée par une mairie	0.018 [0.006]	0.009 [0.005]	0.009
Other administrative document	0.072 [0.014]	0.108 [0.018]	-0.036
Other non-administrative document	0.032 [0.014]	0.056 [0.020]	-0.023
Convention de vente non-officielle	0.003 [0.002]	0.001 [0.001]	0.002
Autre document attestant d'une transaction	0.118 [0.024]	0.392 [0.118]	-0.274**
Aucun document	0.772 [0.039]	0.451 [0.107]	0.322***
<u>Use of the last loan</u>			
Purchase of inputs	N=609 0.362 [0.065]	N=497 0.345 [0.057]	0.017
Purchase of agricultural equipment	0.064 [0.017]	0.061 [0.025]	0.003
Purchase of agricultural land	0.003 [0.003]	0.002 [0.002]	0.001
Investment in a non-agricultural activity	0.312 [0.032]	0.452 [0.082]	-0.139
Housing	0.011 [0.004]	0.021 [0.010]	-0.010
Education	0.004 [0.002]	0.006 [0.004]	-0.002
Health	0.087 [0.024]	0.032 [0.013]	0.055**
Ceremonies	0.140 [0.042]	0.069 [0.044]	0.071
Other	0.018 [0.006]	0.013 [0.005]	0.004

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***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 16: Balance on Agricultural Assets

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1455 Mean/SE	Control villages N=1513 Mean/SE	
Agricultural equipment:			
Farm tractor	0.020 [0.007]	0.012 [0.004]	0.008
Cart	0.055 [0.015]	0.073 [0.019]	-0.018
Plough	0.260 [0.049]	0.249 [0.053]	0.010
Grain crusher	0.010 [0.002]	0.003 [0.002]	0.008**
Husker	0.011 [0.003]	0.004 [0.002]	0.007*
Storehouse / Store	0.343 [0.047]	0.375 [0.044]	-0.032
Motor pump	0.003 [0.003]	0.010 [0.003]	-0.007
Sprayer	0.310 [0.043]	0.212 [0.041]	0.099*
Rototiller	0.018 [0.008]	0.009 [0.003]	0.009
Labour animals	0.332 [0.048]	0.301 [0.062]	0.031
Rice husker	0.002 [0.001]	0.001 [0.001]	0.001
Milking machine	0.003 [0.001]	0.001 [0.001]	0.002
Livestock owned by the HH			
# labour beefs	N=1454 1.901 [0.402]	N=1511 1.548 [0.371]	0.353
# cows	3.890 [0.699]	3.548 [0.925]	0.343
# veals	1.638 [0.355]	1.280 [0.348]	0.358
# bulls	0.788 [0.237]	1.106 [0.364]	-0.318
# goats	3.946 [0.429]	3.303 [0.211]	0.643
# sheeps	4.491 [0.455]	3.779 [0.602]	0.712
# horses	0.108 [0.058]	0.007 [0.006]	0.101*
# chicken	11.904 [1.153]	8.997 [1.138]	2.907*
# ducks	0.379 [0.065]	0.243 [0.060]	0.136
# guinea fowls	3.389 [0.534]	2.403 [0.418]	0.986
# dunkeys	0.001 [0.001]	0.001 [0.001]	0.000
# pigs	0.645 [0.182]	0.518 [0.231]	0.126

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 17: Balance on Crops

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=3279 Mean/SE	Control villages N=3239 Mean/SE	
Monoculture	0.916 [0.015]	0.818 [0.035]	0.098**
Primary crop			
Maize	0.368 [0.012]	0.403 [0.013]	-0.035**
Sorghum / mil	0.093 [0.011]	0.114 [0.021]	-0.022
Soy	0.126 [0.013]	0.106 [0.016]	0.021
Yams	0.103 [0.012]	0.097 [0.014]	0.007
Cotton	0.171 [0.029]	0.131 [0.027]	0.039
Cashew	0.055 [0.014]	0.043 [0.017]	0.012
Manioc	0.035 [0.011]	0.040 [0.014]	-0.006
Other	0.050 [0.009]	0.066 [0.009]	-0.016
Secondary crop			
Maize	N=285 0.177 [0.057]	N=500 0.113 [0.035]	0.064
Sorghum / mil	0.410 [0.071]	0.303 [0.047]	0.106
Soy	0.086 [0.030]	0.131 [0.024]	-0.045
Yams	0.087 [0.020]	0.084 [0.016]	0.004
Cotton	0.016 [0.011]	0.035 [0.016]	-0.019
Cashew	0.030 [0.018]	0.038 [0.012]	-0.008
Manioc	0.067 [0.017]	0.158 [0.059]	-0.091
Niebe / beans	0.062 [0.018]	0.051 [0.014]	0.011
Other	0.064 [0.012]	0.087 [0.017]	-0.022
Mode of soil labour			
Manually with mounds	N=3278 0.300 [0.040]	N=3239 0.363 [0.050]	-0.063
Manually without mounds	0.345 [0.040]	0.309 [0.031]	0.036
Plough	0.260 [0.055]	0.265 [0.054]	-0.005
With own tractor	0.016 [0.006]	0.013 [0.005]	0.002
With a rental tractor	0.079 [0.030]	0.050 [0.016]	0.030
Expenses for soil labour (TCFA)	N=3255 127.968 [31.837]	N=3200 446.191 [233.363]	-318.223

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 18: Balance on crop inputs

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=3279 Mean/SE	(2) Control villages N=3239 Mean/SE	
Amount of seeds used Reported in Kg	N=2605 95.168 [27.901]	N=2700 56.754 [7.085]	38.414
Reported in seedling	N=366 912.670 [258.025]	N=296 13515.521 [9497.461]	-1.26e+04
Expenses for seeds (TCFA)	N=167 165.770 [61.306]	N=296 131.865 [62.929]	33.905
Use of improved seeds	N=3279 0.017 [0.004]	N=3239 0.013 [0.005]	0.004
Use of fertilisers	0.452 [0.059]	0.403 [0.066]	0.050
Type of fertiliser	N=1492	N=1464	
Only organic fertilisers	0.034 [0.013]	0.044 [0.027]	-0.011
Only mineral fertilizers	0.944 [0.021]	0.908 [0.037]	0.036
Both	0.023 [0.010]	0.048 [0.024]	-0.025
Expenses for fertilisers (TCFA)	N=1488 720.536 [379.339]	N=1456 943.510 [632.405]	-222.974
Use of pesticides	N=3279 0.644 [0.031]	N=3239 0.624 [0.035]	0.020
Expenses for pesticides (TCFA)	N=2075 338.467 [136.721]	N=2087 264.692 [152.395]	73.775

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 19: Balance on Labour for Agriculture

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=3277 Mean/SE	Control villages N=3239 Mean/SE	
# people working on soil preparation	3.778 [0.203]	3.772 [0.158]	0.006
# days worked on soil preparation	8.563 [0.623]	8.896 [1.044]	-0.333
# people working on seeding	4.851 [0.212]	4.572 [0.228]	0.279
# days worked on seeding	6.901 [0.454]	7.017 [0.480]	-0.116
# people working in cultivation of crops	4.305 [0.289]	4.201 [0.326]	0.104
# days worked in cultivation of crops	12.222 [1.064]	11.210 [1.479]	1.012
# people harvesting	6.247 [0.310]	5.928 [0.326]	0.319
no. of days people harvested	18.287 [1.062]	17.331 [1.430]	0.956

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 20: Balance on Plot Investment

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=1908 Mean/SE	(2) Control villages N=2055 Mean/SE	
Infrastructures on the plot	0.268 [0.033]	0.202 [0.039]	0.066
Improved these infrastructures over the last year	0.169 [0.030]	0.136 [0.023]	0.033
Improved access to water	0.014 [0.005]	0.031 [0.007]	-0.016*
Actions for soil and water sources conservation	0.308 [0.051]	0.343 [0.034]	-0.035
Other technologies to increase soil fertility	0.080 [0.016]	0.129 [0.023]	-0.048*
Other actions for water source conservation	0.018 [0.006]	0.032 [0.011]	-0.013
Tree planting	0.163 [0.022]	0.188 [0.026]	-0.025
Fallowing	0.108 [0.017]	0.097 [0.018]	0.011
Rental activities			
The whole plot	0.005 [0.002]	0.008 [0.003]	-0.002
A part of the plot	0.042 [0.009]	0.027 [0.004]	0.015
No	0.953 [0.009]	0.965 [0.005]	-0.012
Received rents (cash or in kind)	0.105 [0.037]	0.144 [0.052]	-0.039

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 21: Balance on Agricultural Production

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages Mean/SE	Control villages Mean/SE	
	N=2863	N=2866	
Estimated value of the harvest (Primary crop, TCFA)	8680.212 [3465.363]	11941.711 [6208.865]	-3261.500
	N=3231	N=3156	
<u>Share of the harvest (primary crop) for:</u>			
Sales	65.352 [1.469]	59.520 [2.471]	5.832**
Household consumption	22.340 [1.705]	27.649 [2.110]	-5.310*
Storage	11.701 [0.811]	12.510 [1.167]	-0.810
Lost	0.608 [0.112]	0.320 [0.089]	0.288**
	N=3257	N=3156	
Estimated value of the harvest (Secondary crop, TCFA)	97.801 [69.237]	39.973 [23.924]	57.828
<u>Share of the harvest (secondary crop) for:</u>			
Sales	32.880 [4.820]	47.126 [5.006]	-14.247**
Household consumption	51.127 [4.248]	36.735 [2.727]	14.392***
Storage	15.253 [1.819]	15.829 [3.054]	-0.576
Lost	0.740 [0.451]	0.310 [0.140]	0.431

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 22: Balance on Food Security (Recent)

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1455 Mean/SE	Control villages N=1513 Mean/SE	
Over the last 7 days:			
Worried about lacking food	0.110 [0.020]	0.144 [0.031]	-0.034
Had to depend on less preferred or cheaper food	0.503 [0.097]	0.660 [0.099]	-0.157
Had to eat smaller portions	0.215 [0.046]	0.294 [0.045]	-0.079
Had to eat less meals	0.210 [0.041]	0.325 [0.040]	-0.115**
Adults ate less	0.170 [0.033]	0.251 [0.042]	-0.080
Borrowed food or depended on help	0.152 [0.027]	0.167 [0.031]	-0.016
# meals by adults per day	2.912 [0.048]	2.765 [0.040]	0.147**
	N=925	N=879	
# meals by children <5 years old per day	4.298 [0.084]	3.867 [0.093]	0.431***

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 23: Balance on Food Security (Past year)

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=1455 Mean/SE	(2) Control villages N=1513 Mean/SE	
Food shortage over the last year	0.141 [0.017]	0.139 [0.018]	0.001
Months of food shortage:	N=191	N=184	
January	0.052 [0.020]	0.060 [0.023]	-0.009
February	0.238 [0.063]	0.105 [0.037]	0.134*
March	0.211 [0.048]	0.297 [0.053]	-0.087
April	0.226 [0.051]	0.345 [0.085]	-0.119
May	0.264 [0.058]	0.403 [0.060]	-0.140*
June	0.240 [0.079]	0.218 [0.049]	0.023
July	0.178 [0.075]	0.213 [0.058]	-0.035
August	0.101 [0.042]	0.100 [0.039]	0.001
September	0.025 [0.012]	0.031 [0.017]	-0.006
October	0.010 [0.008]	0.029 [0.017]	-0.019
November	0.020 [0.012]	0.037 [0.018]	-0.017
December	0.023 [0.013]	0.047 [0.019]	-0.024
Reason for food shortage:			
Insufficient stock due to drought	0.200 [0.069]	0.215 [0.060]	-0.015
Insufficient stock due to pests	0.073 [0.018]	0.174 [0.075]	-0.101
Insufficient stock due to size of the plot	0.173 [0.058]	0.286 [0.040]	-0.113
Insufficient stock due to lack of inputs	0.156 [0.042]	0.165 [0.040]	-0.009
Food on the market is too expensive	0.266 [0.052]	0.323 [0.061]	-0.057
Transport costs to the market too high	0.160 [0.066]	0.048 [0.030]	0.112
No food on the market	0.022 [0.011]	0.012 [0.008]	0.010
Floods / water-logging	0.025 [0.016]	0.004 [0.003]	0.021
Other	0.075 [0.023]	0.154 [0.028]	-0.078**

The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

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Table A - 24: Balance on Women's Access to Land

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages Mean/SE N=1312	(2) Control villages Mean/SE N=1334	
In a relationship	0.934 [0.010]	0.909 [0.011]	0.025
# children	4.653 [0.119]	4.470 [0.128]	0.183
<u>Proportion of land that would keep in case of separation:</u>			
All	0.016 [0.005]	0.026 [0.009]	-0.009
More than half	0.024 [0.013]	0.007 [0.004]	0.017
Half	0.025 [0.005]	0.048 [0.015]	-0.023
Less than half	0.053 [0.011]	0.029 [0.006]	0.024*
None	0.882 [0.022]	0.890 [0.020]	-0.008
<u>Who would keep the house in case of separation:</u>			
The respondent	0.026 [0.007]	0.027 [0.006]	-0.001
The partner	0.695 [0.037]	0.762 [0.026]	-0.068
Both of them	0.045 [0.010]	0.047 [0.011]	-0.002
The children	0.219 [0.031]	0.152 [0.027]	0.067
Other	0.015 [0.005]	0.011 [0.004]	0.004
<u>Proportion of land that would keep in case of death of the partner:</u>			
All	0.087 [0.017]	0.073 [0.021]	0.014
More than half	0.024 [0.011]	0.015 [0.006]	0.009
Half	0.077 [0.013]	0.120 [0.029]	-0.043
Less than half	0.270 [0.020]	0.194 [0.025]	0.076**
None	0.541 [0.037]	0.598 [0.042]	-0.056
Received or inherited non-agricultural land from parents	0.038 [0.007]	0.046 [0.012]	-0.008
Will receive or inherit non-agricultural land from parents	0.074 [0.020]	0.080 [0.016]	-0.007
Received or inherited agricultural land from parents	0.055 [0.010]	0.076 [0.013]	-0.020
Will receive or inherit agricultural land from parents	0.088 [0.021]	0.112 [0.026]	-0.024

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 25: Balance on Women's resources and entitlements

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1312 Mean/SE	Control villages N=1334 Mean/SE	
Works most of the time on a plot	0.398 [0.029]	0.391 [0.036]	0.006
Decides on which plot to work	0.379 [0.059]	0.404 [0.049]	-0.025
Husband would allow her to buy a plot if has the money	0.652 [0.045]	0.726 [0.048]	-0.074
Able to register the plot under her name	0.885 [0.020]	0.901 [0.022]	-0.016
Has money or assets she can use	0.535 [0.033]	0.530 [0.039]	0.004
A woman can:			
Access land			
Without restriction	0.319 [0.033]	0.351 [0.062]	-0.032
With agreement of the HH	0.189 [0.025]	0.199 [0.027]	-0.011
With agreement of the family	0.190 [0.027]	0.215 [0.027]	-0.024
With agreement of the village chief or land	0.022 [0.008]	0.013 [0.005]	0.010
Cannot	0.280 [0.043]	0.222 [0.048]	0.058
Decide on how to use land			
Without restriction	0.249 [0.032]	0.264 [0.040]	-0.016
With agreement of the HH	0.236 [0.025]	0.311 [0.026]	-0.075**
With agreement of the family	0.159 [0.023]	0.180 [0.025]	-0.022
With agreement of the village chief or land	0.019 [0.006]	0.009 [0.004]	0.010
Cannot	0.338 [0.046]	0.236 [0.047]	0.102
Inherit land from her husband			
Without restriction	0.222 [0.035]	0.206 [0.041]	0.016
With agreement of the HH	0.202 [0.019]	0.177 [0.033]	0.025
With agreement of the family	0.277 [0.029]	0.311 [0.039]	-0.034
With agreement of the village chief or land	0.014 [0.007]	0.008 [0.003]	0.006
Cannot	0.285 [0.046]	0.297 [0.045]	-0.012

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Inherit land from her father			
Without restriction	0.707 [0.018]	0.676 [0.022]	0.032
With agreement of the HH	0.092 [0.018]	0.123 [0.024]	-0.031
With agreement of the family	0.119 [0.021]	0.124 [0.026]	-0.005
With agreement of the village chief or land	0.014 [0.006]	0.003 [0.001]	0.012*
Cannot	0.068 [0.016]	0.075 [0.020]	-0.007
Make decisions within the HH			
Without restriction	0.165 [0.023]	0.176 [0.024]	-0.012
With agreement of the HH	0.396 [0.036]	0.441 [0.036]	-0.045
With agreement of the family	0.088 [0.015]	0.136 [0.020]	-0.049*
With agreement of the village chief or land	0.014 [0.005]	0.002 [0.001]	0.012**
Cannot	0.338 [0.037]	0.244 [0.047]	0.094
Make decisions on land			
Without restriction	0.172 [0.024]	0.178 [0.030]	-0.006
With agreement of the HH	0.228 [0.026]	0.299 [0.034]	-0.071*
With agreement of the family	0.182 [0.025]	0.208 [0.024]	-0.026
With agreement of the village chief or land	0.019 [0.007]	0.018 [0.008]	0.001
Cannot	0.398 [0.041]	0.296 [0.053]	0.102

The value displayed for t-tests are the differences in the means across the groups.
Standard errors are clustered at the village

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 26: Balance on Women's Community Participation

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=1312 Mean/SE	Control villages N=1334 Mean/SE	
Participation in local meetings			
Always	0.129 [0.025]	0.135 [0.029]	-0.005
Sometimes	0.263 [0.029]	0.240 [0.021]	0.024
Rarely	0.199 [0.022]	0.210 [0.026]	-0.011
Never	0.409 [0.048]	0.416 [0.023]	-0.007
Why not participating			
No meeting	N=598 0.119 [0.026]	N=576 0.172 [0.047]	-0.053
Too far	0.032 [0.012]	0.025 [0.007]	0.007
Did not know	0.249 [0.038]	0.194 [0.042]	0.054
Not welcomes / invited	0.167 [0.026]	0.141 [0.028]	0.026
Useless	0.262 [0.038]	0.333 [0.047]	-0.070
Disagrees with these meetings	0.098 [0.024]	0.040 [0.013]	0.058**
Other	0.072 [0.018]	0.094 [0.012]	-0.022
Votes for local elections			
Always	N=1312 0.552 [0.043]	N=1334 0.468 [0.034]	0.084
Sometimes	0.214 [0.025]	0.244 [0.014]	-0.030
Rarely	0.131 [0.026]	0.133 [0.025]	-0.002
Never	0.103 [0.023]	0.156 [0.022]	-0.053*
Member of an association/group	0.144 [0.022]	0.150 [0.033]	-0.006

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 27: Balance on Young Men's Land Rights

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=323 Mean/SE	(2) Control villages N=361 Mean/SE	
Manages a plot	0.434 [0.045]	0.378 [0.043]	0.056
Can use HH equipment and labor force	N=136 0.638 [0.074]	N=142 0.841 [0.040]	-0.202**
Decides on how to use the harvest	0.570 [0.070]	0.755 [0.057]	-0.184**
Decides which plot to manage	0.311 [0.062]	0.517 [0.061]	-0.207**
Recieved or inherited non-agricultural land from parents	N=323 0.060 [0.012]	N=361 0.097 [0.031]	-0.037
Will receive or inherit non-agricultural land from parents	N=301 0.538 [0.061]	N=339 0.498 [0.067]	0.040
Recieved or inherited agricultural land from parents	N=323 0.139 [0.024]	N=361 0.199 [0.029]	-0.059
Will receive or inherit agricultural land from parents	N=273 0.694 [0.049]	N=297 0.751 [0.039]	-0.057
Father would allow her to buy a plot if has the money	N=323 0.839 [0.040]	N=361 0.929 [0.019]	-0.089**
Able to register the plot under her name	N=274 0.987 [0.010]	N=337 0.996 [0.004]	-0.009

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 28: Balance on Young Men's Resources and Entitlements

	Treatment status		Difference t-test (1)-(2)
	(1) ProPFR villages N=323 Mean/SE	(2) Control villages N=361 Mean/SE	
Has money or assets he can use	0.435 [0.040]	0.495 [0.041]	-0.060
<i>A young man can:</i>			
Access land			
Without restriction	0.725 [0.047]	0.764 [0.048]	-0.038
With agreement of the HH	0.114 [0.038]	0.159 [0.039]	-0.046
With agreement of the family	0.085 [0.020]	0.053 [0.017]	0.032
With agreement of the village chief or land chief	0.044 [0.026]	0.007 [0.005]	0.038
Cannot	0.032 [0.010]	0.018 [0.009]	0.014
Decide on how to use land			
Without restriction	0.560 [0.038]	0.648 [0.043]	-0.088
With agreement of the HH	0.245 [0.048]	0.245 [0.034]	-0.000
With agreement of the family	0.141 [0.035]	0.054 [0.019]	0.088**
With agreement of the village chief or land chief	0.022 [0.016]	0.010 [0.006]	0.013
Cannot	0.032 [0.010]	0.044 [0.013]	-0.012
Inherit land from his mother			
Without restriction	0.819 [0.033]	0.811 [0.039]	0.008
With agreement of the HH	0.081 [0.030]	0.112 [0.030]	-0.031
With agreement of the family	0.072 [0.014]	0.045 [0.017]	0.028
With agreement of the village chief or land chief	0.017 [0.012]	0.001 [0.001]	0.016
Cannot	0.011 [0.006]	0.032 [0.011]	-0.021*

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Impact Evaluation of ProPFR – Baseline Report

Inherit land from his father			
Without restriction	0.829 [0.035]	0.876 [0.034]	-0.047
With agreement of the HH	0.087 [0.029]	0.100 [0.030]	-0.013
With agreement of the family	0.067 [0.018]	0.021 [0.009]	0.046**
With agreement of the village chief or land chief	0.015 [0.011]	0.000 [0.000]	0.015
Cannot	0.002 [0.002]	0.003 [0.003]	-0.002
Make decisions within the HH			
Without restriction	0.367 [0.034]	0.409 [0.053]	-0.041
With agreement of the HH	0.329 [0.051]	0.377 [0.043]	-0.048
With agreement of the family	0.107 [0.026]	0.073 [0.015]	0.034
With agreement of the village chief or land chief	0.032 [0.016]	0.002 [0.002]	0.030*
Cannot	0.165 [0.033]	0.139 [0.035]	0.026
Make decisions on land			
Without restriction	0.289 [0.026]	0.400 [0.039]	-0.111**
With agreement of the HH	0.323 [0.049]	0.256 [0.041]	0.067
With agreement of the family	0.155 [0.035]	0.096 [0.016]	0.059
With agreement of the village chief or land chief	0.023 [0.015]	0.012 [0.007]	0.012
Cannot	0.209 [0.029]	0.236 [0.039]	-0.027

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***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A - 29: Balance on Young Men's Community Participation

	Treatment status		Difference t-test (1)-(2)
	(1)	(2)	
	ProPFR villages N=323 Mean/SE	Control villages N=361 Mean/SE	
Participation in local meetings			
Always	0.176 [0.030]	0.166 [0.031]	0.010
Sometimes	0.369 [0.043]	0.291 [0.041]	0.078
Rarely	0.208 [0.031]	0.212 [0.050]	-0.005
Never	0.247 [0.042]	0.330 [0.036]	-0.083
Why not participating			
No meeting	N=93 0.155 [0.040]	N=127 0.188 [0.049]	-0.033
Too far	0.032 [0.019]	0.006 [0.006]	0.026
Did not know	0.289 [0.066]	0.221 [0.060]	0.068
Not welcomes / invited	0.111 [0.042]	0.143 [0.045]	-0.032
Useless	0.227 [0.053]	0.245 [0.067]	-0.017
Disagrees with these meetings	0.122 [0.043]	0.058 [0.026]	0.065
Other	0.064 [0.038]	0.140 [0.044]	-0.077
Votes for local elections			
Always	N=323 0.468 [0.032]	N=361 0.404 [0.027]	0.064
Sometimes	0.280 [0.028]	0.218 [0.031]	0.062
Rarely	0.111 [0.023]	0.152 [0.019]	-0.040
Never	0.140 [0.021]	0.226 [0.025]	-0.086***
Member of an association/group	0.112 [0.026]	0.114 [0.045]	-0.001

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at the village level.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

APPENDIX 2: HOUSEHOLD SURVEY

[SEE ATTACHED PDF – This will be added here in the final version]

APPENDIX 3: VILLAGE SURVEY

[SEE ATTACHED PDF – This will be added here in the final version]