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| Development Impact Evaluation |
| Burkina Faso Baseline Report |
| [Document subtitle] |

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| April 2018 |

# Introduction

# Baseline Household Survey

# Data Collection

The baseline household survey includes questions on (i) socio-economic status of participants; (ii) household ownership of agricultural equipment, assets, and livestock; and (iii) agricultural and non-agricultural production activities.

Fieldwork for the household survey started in August 15, 2017 and lasted until October 21, 2017.

# Sample

The baseline household survey was implemented in four regions in Burkina Faso: Boucle du Mouhoun, Centre Ouest, Est, and Sud Ouest.

Figure 1: Sample by Region

In total, 630 participants from 10 forets and 33 blocs were interviewed. Randomization was conducted at bloc-level, and equal number of households was sampled for the treatment and control groups from each of the 33 blocs.

Table 1: Sample size by bloc

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Foret | Bloc | Control | Treatment | Total |
| Bontioli | Baro | 10 | 10 | 20 |
| Bontioli | 10 | 10 | 20 |
| Bouroum | 10 | 10 | 20 |
| Dankotnazou | 8 | 10 | 18 |
| Hemkoa | 10 | 10 | 20 |
| Tiankoura | 10 | 10 | 20 |
| Tovor | 10 | 10 | 20 |
| Zambo | 10 | 10 | 20 |
| Kari | Kari | 10 | 10 | 20 |
| Oula | 9 | 10 | 19 |
| Nazinon | Galo | 2 | 7 | 9 |
| Nadono | 7 | 9 | 16 |
| Silimba | 10 | 10 | 20 |
| Nosebou | Etouayou | 10 | 10 | 20 |
| Oualou | Banouba | 7 | 10 | 17 |
| Oualou | 10 | 10 | 20 |
| Sorobouli | Boromissi | 10 | 10 | 20 |
| Souho | 10 | 10 | 20 |
| Tapoaboopo | Koena | 9 | 10 | 19 |
| Koguini | 10 | 10 | 20 |
| Matiacoali | 10 | 9 | 19 |
| Nansougou | 9 | 9 | 18 |
| Ougarou | 10 | 9 | 19 |
| Sakoanie | 8 | 10 | 18 |
| Tchalbonga | 10 | 10 | 20 |
| Toabili | 10 | 10 | 20 |
| Tiogo | Dassa | 10 | 10 | 20 |
| Kyon | 10 | 10 | 20 |
| Tenado | 10 | 10 | 20 |
| Tiogo | 10 | 10 | 20 |
| Tisse | Bissanderou | 10 | 10 | 20 |
| Didie | 10 | 10 | 20 |
| Toroba | Toroba | 8 | 10 | 18 |
|  | **Total** | **307** | **323** | **630** |

Table : Baseline Sample by Treatment Status

|  |  |  |
| --- | --- | --- |
|  | Num | Percentage |
| Traitement collectif | 163 | 26% |
| Controle collectif | 153 | 24% |
| Traitement individuel | 160 | 25% |
| Controle individuel | 154 | 24% |
| Total | 630 | 100% |

# Baseline Balance

Table 3 shows that participants in the comparison group are similar to those in the treatment groups in terms of household characteristics, household ownership, and agricultural production.

Table 3: Balance Test Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | (1) |  | (2) | T-test |
|  |  | Control |  | Treatment | (1)-(2) |
| Variable | N | Mean/SE | N | Mean/SE | p-value |
| ***Household characteristics*** |  |  |  |  |  |
| Chef de votre menage | 307 | 0.583 | 323 | 0.675 | 0.018\*\* |
|  | [0.028] |  | [0.026] |  |
| % monogamously or polygamously married | 307 | 0.863 | 323 | 0.901 | 0.147 |
|  | [0.020] |  | [0.017] |  |
| Nombre de membres de menage | 307 | 12.739 | 323 | 13.254 | 0.391 |
|  | [0.468] |  | [0.407] |  |
| % with at least some years of education | 307 | 0.192 | 323 | 0.180 | 0.681 |
|  | [0.023] |  | [0.021] |  |
| Annual income (in 1,000 FCFA) | 300 | 507.804 | 316 | 507.854 | 0.930 |
|  | [37.476] |  | [32.661] |  |
| Annual consumption (in 1,000 FCFA) | 307 | 1161.266 | 323 | 1094.578 | 0.462 |
|  | [64.905] |  | [53.638] |  |
| Asset Index | 307 | -0.155 | 323 | 0.148 | 0.070\* |
|  | [0.102] |  | [0.129] |  |
| Membre d'un Groupement de Gestion Forestière (GGF) | 307 | 0.531 | 323 | 0.591 | 0.136 |
|  | [0.029] |  | [0.027] |  |
| ***Agricultural production*** |  |  |  |  |  |
| Valeur totale de la production agricole - de la saison agricole passe | 258 | 697.112 | 262 | 557.940 | 0.415 |
|  | [164.633] |  | [48.012] |  |
| Agricultural cost (in 1,000 FCFA) | 259 | 86.326 | 262 | 100.608 | 0.278 |
|  | [8.249] |  | [11.136] |  |
| Agricultural profit (in 1,000 FCFA) | 258 | 610.451 | 262 | 457.331 | 0.363 |
|  | [163.007] |  | [45.513] |  |
| Agricultural yield (in 1,000 FCFA/ha) | 258 | 228.137 | 262 | 272.374 | 0.672 |
|  | [63.314] |  | [82.614] |  |
| ***Agricultural input*** |  |  |  |  |  |
| Possession de terre ces 12 derniers mois par le menage | 306 | 0.846 | 322 | 0.814 | 0.295 |
|  | [0.021] |  | [0.022] |  |
| Superficie totale de terres du menage | 259 | 5.631 | 262 | 5.569 | 0.875 |
|  | [0.286] |  | [0.274] |  |
| Superficie totale de terre cultivées du menage | 259 | 4.558 | 262 | 4.604 | 0.874 |
|  | [0.224] |  | [0.229] |  |
| Achat de semences améliorée pour utilisation sur champs | 259 | 0.286 | 262 | 0.286 | 0.986 |
|  | [0.028] |  | [0.028] |  |
| Achat d'engrais chimiques pour utilisation sur les champs | 259 | 0.521 | 262 | 0.531 | 0.821 |
|  | [0.031] |  | [0.031] |  |
| Achat d'engrais organiques pour utilisation sur les champs | 259 | 0.162 | 262 | 0.141 | 0.507 |
|  | [0.023] |  | [0.022] |  |
| Achat de produits phytosanitaires pour utilisation sur les champs | 259 | 0.571 | 262 | 0.538 | 0.442 |
|  | [0.031] |  | [0.031] |  |
| Achat ou location de main d'oeuvre agricole pour travail sur les champs | 259 | 0.355 | 262 | 0.366 | 0.792 |
|  | [0.030] |  | [0.030] |  |

Note: The t-test compares the difference in means between control and treatment groups and controls for the forest covariate variable.

# Household Characteristics

In total, 630 participants were interviewed during the baseline survey.

Figure 2: Baseline Sample by Foret

Most of the respondents are farmers (90%) and 6% of the respondents are cattle farmers.

Figure 3: Occupation of Respondents

During the baseline survey, respondents were asked about the total income from their primary and secondary occupations, if any, in the past 12 months. The households were also asked the total value of food taken in the past 7 days. Based on the answers, we calculated the total value of annual food consumption.

The average annual income is 507,830 CFA (approximately 948 USD), and average annual food consumption is 1,127,075 CFA (2,104 USD).[[1]](#footnote-1)

Table 4: Annual Income and Consumption by foret

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Income | | | Consumption | | |
|  | mean | sd | count | mean | sd | count |
| Kari | 839,474 | 786,576 | 38 | 776,545 | 830,169 | 39 |
| Toroba | 623,056 | 636,932 | 18 | 532,800 | 306,681 | 18 |
| Nosebou | 1,353,256 | 1,042,572 | 18 | 411,615 | 605,056 | 20 |
| Oualou | 590,135 | 537,239 | 37 | 1,455,700 | 1,293,138 | 37 |
| Sorobouli | 1,268,286 | 840,765 | 35 | 463,591 | 459,567 | 40 |
| Tisse | 584,875 | 490,458 | 40 | 1,431,366 | 1,015,759 | 40 |
| Nazinon | 287,361 | 318,728 | 43 | 674,761 | 845,515 | 45 |
| Tiogo | 148,791 | 175,499 | 79 | 1,068,559 | 832,271 | 80 |
| Bontioli | 313,660 | 473,269 | 155 | 981,841 | 862,066 | 158 |
| Tapoaboopo | 542,492 | 529,491 | 153 | 1,707,911 | 1,252,029 | 153 |
| Total | 507,830 | 614,412 | 616 | 1,127,075 | 1,051,661 | 630 |

Most of the respondents in the sample are married - 47% of the sampled individuals are monogamously married and 42% of the sampled individuals are polygamously married.

Figure 4: Situation Matrimoniale

63% of participants in the sample are household head and on average, there are 13 household members in each participant’s household.

Table 5: Nombre de membres de menage

|  |  |  |  |
| --- | --- | --- | --- |
|  | mean | sd | count |
| Kari | 12.10 | 6.33 | 39 |
| Toroba | 11.72 | 5.56 | 18 |
| Nosebou | 15.95 | 11.63 | 20 |
| Oualou | 9.86 | 5.22 | 37 |
| Sorobouli | 12.98 | 8.95 | 40 |
| Tisse | 13.00 | 6.92 | 40 |
| Nazinon | 11.02 | 5.99 | 45 |
| Tiogo | 14.99 | 8.39 | 80 |
| Bontioli | 11.51 | 6.38 | 158 |
| Tapoaboopo | 14.86 | 8.78 | 153 |
| Total | 13.00 | 7.75 | 630 |

Also, 63% of the respondents reported that they are the head of their household.

Table 6: Chef de menage

|  |  |  |  |
| --- | --- | --- | --- |
|  | mean | sd | count |
| Kari | 0.90 | 0.31 | 39 |
| Toroba | 0.83 | 0.38 | 18 |
| Nosebou | 0.75 | 0.44 | 20 |
| Oualou | 0.65 | 0.48 | 37 |
| Sorobouli | 0.68 | 0.47 | 40 |
| Tisse | 0.68 | 0.47 | 40 |
| Nazinon | 0.71 | 0.46 | 45 |
| Tiogo | 0.58 | 0.50 | 80 |
| Bontioli | 0.50 | 0.50 | 158 |
| Tapoaboopo | 0.63 | 0.48 | 153 |
| Total | 0.63 | 0.48 | 630 |

The education level in the sample is quite low. The majority of participants in the sample (81%) didn’t receive any education, and 12% of the participants only received primary school education.

Figure 5: Niveau scolaire

Table 7: Percentage of respondents having some years of education

|  |  |  |  |
| --- | --- | --- | --- |
| % with education | mean | sd | count |
| Kari | 0.18 | 0.39 | 39 |
| Toroba | 0.17 | 0.38 | 18 |
| Nosebou | 0.25 | 0.44 | 20 |
| Oualou | 0.14 | 0.35 | 37 |
| Sorobouli | 0.18 | 0.38 | 40 |
| Tisse | 0.25 | 0.44 | 40 |
| Nazinon | 0.20 | 0.40 | 45 |
| Tiogo | 0.18 | 0.38 | 80 |
| Bontioli | 0.24 | 0.43 | 158 |
| Tapoaboopo | 0.12 | 0.33 | 153 |
| Total | 0.19 | 0.39 | 630 |

56% of participants in the sample reported that they are a member of Groupement de Gestion Forestière (GGF). There are large variations in GGF membership across foret – 97% of participants living in Oualou reported that they are a member of GGF, compared to 18% in Nazinon.

Figure 6: Membre de GGF

Table 8: Membre d'un Groupement de Gestion Forestière (GGF)

|  |  |  |  |
| --- | --- | --- | --- |
|  | mean | sd | count |
| Kari | 0.72 | 0.46 | 39 |
| Toroba | 0.89 | 0.32 | 18 |
| Nosebou | 0.80 | 0.41 | 20 |
| Oualou | 0.97 | 0.16 | 37 |
| Sorobouli | 0.53 | 0.51 | 40 |
| Tisse | 0.78 | 0.42 | 40 |
| Nazinon | 0.18 | 0.39 | 45 |
| Tiogo | 0.30 | 0.46 | 80 |
| Bontioli | 0.32 | 0.47 | 158 |
| Tapoaboopo | 0.80 | 0.40 | 153 |
| Total | 0.56 | 0.50 | 630 |

# Household Assets

During the baseline survey, participants in the sample were asked about the type of agricultural equipment owned by their household. Almost all participants in the sample (91%) own hoe, 89% own machette, 69% own hache, and 63% own charue.

Figure 7: Biens de production agricole

Also, the majority of households own a mat (99%), bike (95%), chair (87%), cell phone (87%), and a flash light (81%).

Figure 8: Possession of Assets

Table 10 shows the asset and input indices by foret. It seems that there are large variation in asset and input ownership by foret.

Table 9: Asset Index by Foret

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Asset Index** | | **Input Index** | |  |
|  | mean | sd | mean | sd | N |
| Kari | 0.50 | 1.91 | -0.11 | 1.77 | 39 |
| Toroba | 0.88 | 1.52 | 0.77 | 1.60 | 18 |
| Nosebou | -0.58 | 1.34 | -1.12 | 1.74 | 20 |
| Oualou | -0.04 | 1.66 | 0.78 | 1.78 | 37 |
| Sorobouli | -0.47 | 1.55 | -0.89 | 1.67 | 40 |
| Tisse | 0.27 | 2.00 | 0.58 | 1.91 | 40 |
| Nazinon | -0.23 | 2.06 | -0.28 | 1.54 | 45 |
| Tiogo | 0.83 | 2.77 | 0.61 | 1.61 | 80 |
| Bontioli | -0.48 | 1.40 | -1.32 | 1.57 | 158 |
| Tapoaboopo | 0.03 | 2.48 | 1.10 | 1.54 | 153 |
| Total | 0.00 | 2.08 | 0.00 | 1.88 | 630 |

92% of households in the sample own poultry, 72% of households in the sample own a goat, own cattle, 59% own a donkey, and 30% own a pig.

Figure 9: Possession of Livestock

# Agricultural Production

83% of households in the sample responded that their household own a land. On average, households in the sample own 5.6 hectare of land, and 4.5 hectare of cultivated land.

Table : Agricultural Land Holding

|  |  |  |
| --- | --- | --- |
|  | Mean | Number of observations |
| Possession de terre ces 12 derniers mois par le menage | 83% | 628 |
| Superficie totale de terres du menage (ha) | 5.60 | 521 |
| Superficie totale de terre cultivées du menage (ha) | 4.58 | 521 |

Figure 10: Land Ownership by Foret

Table 11: Superficie totale de terres du menage (ha)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Superficie totale de terres du menage | | | Superficie totale de terre cultivées du menage | | |
|  | mean | sd | count | mean | sd | count |
| Kari | 8.28 | 5.77 | 36 | 7.83 | 5.16 | 36 |
| Toroba | 8.56 | 4.64 | 18 | 7.89 | 3.63 | 18 |
| Nosebou | 7.25 | 6.45 | 8 | 5.78 | 7.10 | 8 |
| Oualou | 6.48 | 4.41 | 27 | 6.04 | 4.38 | 27 |
| Sorobouli | 7.44 | 5.45 | 18 | 4.76 | 5.84 | 18 |
| Tisse | 7.06 | 4.83 | 33 | 6.03 | 3.50 | 33 |
| Nazinon | 5.06 | 2.95 | 31 | 4.45 | 2.51 | 31 |
| Tiogo | 3.97 | 2.29 | 74 | 3.43 | 1.95 | 74 |
| Bontioli | 4.73 | 4.32 | 135 | 3.64 | 2.60 | 135 |
| Tapoaboopo | 5.50 | 4.60 | 141 | 4.15 | 3.44 | 141 |
| Total | 5.60 | 4.51 | 521 | 4.58 | 3.66 | 521 |

As shown in Figure 11, 29% of households use improved seeds, 53% use chemical fertilizers, 15% use organic fertilizers, 55% use phytosanitary products, and 36% use manual labor.

Figure : Purchase of agricultural inputs

Table 12: Purchase of agricultural input

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Achat de semences améliorée | | | Achat d'engrais chimiques | | | Achat d'engrais organiques | | | Achat de produits phytosanitaires | | | Achat ou location de main d'oeuvre agricole | | |
|  | mean | sd | count | mean | sd | count | mean | sd | count | mean | sd | count | mean | sd | count |
| Kari | 0.58 | 0.50 | 36 | 0.92 | 0.28 | 36 | 0.08 | 0.28 | 36 | 0.86 | 0.35 | 36 | 0.11 | 0.32 | 36 |
| Toroba | 0.67 | 0.49 | 18 | 0.89 | 0.32 | 18 | 0.11 | 0.32 | 18 | 1.00 | 0.00 | 18 | 0.00 | 0.00 | 18 |
| Nosebou | 0.00 | 0.00 | 8 | 0.63 | 0.52 | 8 | 0.13 | 0.35 | 8 | 0.38 | 0.52 | 8 | 0.50 | 0.53 | 8 |
| Oualou | 0.22 | 0.42 | 27 | 0.37 | 0.49 | 27 | 0.11 | 0.32 | 27 | 0.81 | 0.40 | 27 | 0.41 | 0.50 | 27 |
| Sorobouli | 0.22 | 0.43 | 18 | 0.72 | 0.46 | 18 | 0.00 | 0.00 | 18 | 0.67 | 0.49 | 18 | 0.44 | 0.51 | 18 |
| Tisse | 0.30 | 0.47 | 33 | 0.64 | 0.49 | 33 | 0.00 | 0.00 | 33 | 0.61 | 0.50 | 33 | 0.06 | 0.24 | 33 |
| Nazinon | 0.10 | 0.30 | 31 | 0.52 | 0.51 | 31 | 0.29 | 0.46 | 31 | 0.16 | 0.37 | 31 | 0.65 | 0.49 | 31 |
| Tiogo | 0.08 | 0.27 | 74 | 0.26 | 0.44 | 74 | 0.65 | 0.48 | 74 | 0.27 | 0.45 | 74 | 0.81 | 0.39 | 74 |
| Bontioli | 0.46 | 0.50 | 135 | 0.84 | 0.36 | 135 | 0.06 | 0.24 | 135 | 0.44 | 0.50 | 135 | 0.36 | 0.48 | 135 |
| Tapoaboopo | 0.18 | 0.38 | 141 | 0.19 | 0.39 | 141 | 0.04 | 0.19 | 141 | 0.70 | 0.46 | 141 | 0.21 | 0.41 | 141 |
| Total | 0.29 | 0.45 | 521 | 0.53 | 0.50 | 521 | 0.15 | 0.36 | 521 | 0.55 | 0.50 | 521 | 0.36 | 0.48 | 521 |

81% of surveyed respondents reported that they use household savings for agricultural investment, and 7% of the surveyed respondents reported that they borrow money from a cooperative.

Figure : Source of credit for agricultural investment

Surveyed respondents reported that the total value of agricultural production from the past agricultural season is estimated to be 626,991 CFA. Based on the total value of agricultural production, total agricultural cost, and self-reported area of cultivated land, we also calculated the net agricultural yield in monetary terms. The average net yield of surveyed households is 250,426 FCFA/ha.

Table : Agricultural Production

|  |  |  |
| --- | --- | --- |
| *In FCFA* | Mean | N |
| Total value of agricultural production | 626,991 | 520 |
| Total agricultural cost | 93,508 | 521 |
| Total value of agricultural production - total agricultural cost | 533,302 | 520 |
| Net agricultural yield (profit per hectare of land) | 250,426 | 520 |

Table 14: Agricultural yield (in FCFA/ha)

|  |  |  |  |
| --- | --- | --- | --- |
| (in FCFA/ha) | mean | sd | count |
| Kari | 34,285 | 74821 | 36 |
| Toroba | 27,166 | 71884 | 18 |
| Nosebou | 2,429,864 | 3917509 | 8 |
| Oualou | 80,489 | 97055 | 27 |
| Sorobouli | 3,401,465 | 4945551 | 17 |
| Tisse | 98,810 | 173235 | 33 |
| Nazinon | 96,785 | 115046 | 31 |
| Tiogo | 80,104 | 69217 | 74 |
| Bontioli | 76,637 | 236430 | 135 |
| Tapoaboopo | 188,130 | 204581 | 141 |
| Total | 250,426 | 1188224 | 520 |

# Non agricultural activities

Table 15: Participation in any type of entreprise familiale non agricole

|  |  |  |  |
| --- | --- | --- | --- |
| Entreprise familiale non agricole | mean | sd | count |
| Kari | 0.26 | 0.44 | 39 |
| Toroba | 0.17 | 0.38 | 18 |
| Nosebou | 0.00 | 0.00 | 20 |
| Oualou | 0.05 | 0.23 | 37 |
| Sorobouli | 0.00 | 0.00 | 40 |
| Tisse | 0.08 | 0.27 | 40 |
| Nazinon | 0.02 | 0.15 | 45 |
| Tiogo | 0.00 | 0.00 | 80 |
| Bontioli | 0.08 | 0.28 | 158 |
| Tapoaboopo | 0.04 | 0.19 | 153 |
| Total | 0.06 | 0.24 | 630 |

Table 16: Entreprise familiale non agricole

|  |  |  |
| --- | --- | --- |
|  | mean | n |
| Entreprise de transformation de produits agricoles ou animaux sur 12 mois passes | 1% | 628 |
| Entreprise de confection/ Reparation des tissus ou vetements | 0% | 628 |
| Entreprise de construction de maisons | 1% | 628 |
| Entreprise de Commerce du menage | 3% | 628 |
| Entreprise de professions liberales pour son propre compte | 0% | 628 |
| Entreprise dans le domaine du transport | 0% | 628 |
| Entreprise dans le domaine des Hotels | 0% | 628 |
| Entreprise dans un autre domaine non agricole | 1% | 628 |

# Correlation Analysis

It seems that households with higher asset index spend more on agricultural investments, while it is not strongly correlated with their agricultural profit or agricultural yield. Also, respondents that have at least some years of schooling are more likely to spend on agricultural investment, and have higher asset index. Respondents who are member of GCF are more likely to be married, have higher asset index, higher income level, and higher consumption level.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Agricultural cost | Agricultural yield | Asset index | Income | Consumption | Received years of schooling | Married | Member of GGF |
| Agricultural cost | 1.00 |  |  |  |  |  |  |  |
| Agricultural yield | 0.14 | 1.00 |  |  |  |  |  |  |
| Asset index | 0.26 | 0.02 | 1.00 |  |  |  |  |  |
| Income | 0.38 | 0.22 | 0.20 | 1.00 |  |  |  |  |
| Consumption | 0.03 | 0.00 | 0.20 | 0.15 | 1.00 |  |  |  |
| Received years of schooling | 0.12 | -0.06 | 0.18 | 0.06 | 0.09 | 1.00 |  |  |
| Married | -0.04 | 0.04 | 0.06 | 0.11 | 0.02 | -0.22 | 1.00 |  |
| Member of GGF | 0.06 | 0.05 | 0.15 | 0.20 | 0.17 | -0.02 | 0.19 | 1.00 |

Notes:

* I’ve winsorized income & consumption at 99%
* I’ve replaced 8 observations with over 350 ha by dividing 100 (all from same enumerators)
* I’ve replaced one extreme outliers in agricultural production (225000000) to missing

1. To limit the effect of some extreme outliers, we conducted winsorization at 99%. [↑](#footnote-ref-1)