Baseline Data Quality and Analysis Report

MCA-N Contract: 5A01002-A

Data Analysis Report: Detailed Analysis of Data from the CS/INP Household Survey's Baseline Round.

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NORC at the UNIVERSITY of CHICAGO

Data Analysis Report: Detailed Analysis of Data from the CS/INP Household Survey's Baseline Round. Activities

Report submitted to:
MILLENNIUM CHALLENGE ACCOUNT NAMIBIA
117 Sam Nujoma Drive
Windhoek, Namibia

Report submitted by:
YVONNE CAO, CARLOS ECHEVERRIA, SAM HADDAWAY, KAREEM KYSIA, AND CLIFFORD ZINNES
NORC at the University of Chicago
4350 East-West Highway
Bethesda, MD 20814
United States
Tel. (+1) (301)634-9300

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List of Acronyms

CBO	Community-Based Organization
CBRLM	Community-Based Rangeland and Livestock Management
CBNRM	Community-Based Natural Resource Management
CBS	Central Bureau of Statistics
CDSGF	Conservancy Development Support Grant Funds
CDSS	Conservancy Development and Support Services
CPP	Country Pilot Partnership
CRIAA SA-DC	Centre for Research, Information, Action in Africa Southern Africa - Development and Consulting
CS	Conservancy Support
DC	Devil's Claw
DQR	Data Quality Review
EA	Enumeration Area
FGD	Focus Group Discussion
GIS	Geographic Information System
GPS	Global Positioning System
HH	Household
icc	Intra-unit Correlation Coefficient
INP	Indigenous Natural Product
IPTT	Indigenous Plant Task Team
IRDNC	Integrated Rural Development and Nature Conservation
KII	Key Informant Interview
KMS	Kalahari Melon Seed
M&E	Monitoring and Evaluation
MAWF	Ministry of Agriculture, Water and Forestry
MCA-N	Millennium Challenge Account Namibia
MCC	Millennium Challenge Corporation
MET	Ministry of Environment and Tourism
NACSO	Namibian Association of CBNRM Support Organizations
NBRI	National Botanical Research Institute
NCA	Northern Communal Area
NDT	Namibia Development Trust
NNDFN	Nyae Nyae Development Foundation of Namibia
NNF	Namibia Nature Foundation
NORC	NORC at the University of Chicago
NRI	Natural Resources Institute, University of Greenwich (UK)
PIF	Promoting Indigenous Fruit
PPIG	Primary Production Improvement Grants
PPO	Producer and Processor Organization

PSU	Primary Sampling Unit
RFP	Request for Proposal
SDR	Survey Design Report
SW	Survey Warehouse
TOR	Terms of Reference
UoG	University of Greenwich
WWF	World Wildlife Fund

Executive Summary

The Millennium Challenge Account of Namibia (MCA-N) has contracted NORC at the University of Chicago to undertake the impact evaluation of its Activities in the spheres of the Conservancy Support (CS) and the Indigenous Natural Products (INP) Investment. As part of these activities, NORC has been contracted by MCA-Namibia (MCA-N) to implement a 'Conservancy Support and Indigenous Natural Products Household and Organisational Survey; NORC in turn, partnered with a local subcontractor, Survey Warehouse, to carry out the related fieldwork. The specific objectives of this survey project were to conduct a baseline survey for the CS and INP Activities in selected conservancies and PPO coverage areas and to produce clean datasets that cover households and communities affected by the CS and INP Activities.

The present report builds upon the previously submitted baseline survey report. Whereas the baseline survey report summarized accomplishments of the survey effort and presented some main findings, this baseline analysis report will provide a more thorough analysis of key relationships among PPO and conservancy households as well as delve more deeply into the limitations of the current dataset.

The methodology for analysis in this report examines issues of interest to MCA-N and stakeholders, particularly in the conservancy and INP sectors and is suitable for a one-period, cross-sectional descriptive study. While the primary purpose of the CS and INP Household Baseline Surveys (henceforth, the "Surveys") is to create a baseline for the impact evaluation, MCA-Namibia rightly understood that the baseline data itself could reveal important stylized facts for policy formulation as well as for the implementers with which it is collaborating. Examples include whether there is a link between better governance and greater economic benefits for member households of PPOs and conservancies, whether younger household members are getting involved in the organizations the MCA is supporting, and whether female-headed as well as poorer households are getting their fair share of benefits from the interventions. A critical aspect of the present report is to determine the baseline value of key variables whose attribution to the Compact intervention is the goal of the later impact evaluation.

For the CS Activity, the sample design was a two-stage sample in which the first-stage sample units were Enumeration Areas (EAs) in conservancies and the second-stage sample units were households. In the case of the CS survey design, the primary sampling unit was the Census EA, and a number of variables were known (from Census and GIS sources) for each EA (or the constituency in which an EA was located) that could be used to assist sample design.

In the INP frame, the PPO name was known for each producer, but not the community (EA or village). Apart from PPO, the only variable useful for constructing an analytical design was INP species. For this reason, it was not possible to construct an analytical design. Instead, it was decided to select a stratified single-stage sample from the frame, where stratification would be by INP species.

Although an independent review of the CS/INP data by Oxford Policy Management found good data quality, this report highlights some of the limitations in the current dataset, particularly for the INP component[1]. These limitations fall broadly into two categories: sampling frame issues and in-field data collection issues. Both issues will affect the final evaluation of the CS/INP activity and this report considers both in turn.

For the CS sample, 1,032 interviews were completed from an initial target of 1,188 interviews (although NORC was contractually required to complete 1,000 interviews). For the INP sample, 296 interviews were completed out of 631 attempted interviews[2]. NORC was asked to complete 500 total INP surveys. However, given the problems with the initial frame, it proved impossible while conducting the fieldwork to reach this target.

Regarding economic activities, almost all conservancy households rely on their own farming activities to earn income. A small proportion of them perform conservancy activities and their earnings from those activities represent less than 10 percent of the household's income, except for conservancy households located in Kavango (35 percent) and Kunene (20 percent). In general, wage income is the main source of household income across regions. This fact could be associated with the uncertain conditions that farm activities face in these conservancies and that input costs outpace, in most cases, the revenues from agriculture and livestock.

On the INP side, households earned relatively little revenue from INP harvesting—an average of 780 NAD from Devil's Claw, and about 450 to 500 NAD for Marula and Ximenia versus average income between 10, and 11,000 NAD. Households with higher income (expenditure) typically earned more revenue from INP harvests.

Additional rounds of data will be collected for treatment areas during and after the interventions (see Evaluation Design Report for details on additional data collection rounds), including the household survey in 2014, where the data collection takes the form of a panel study in which the same participants are interviewed from the baseline.

[1] See 'Ex-Ante Review of Conservancy Support and Indigenous Natural Products (CS/INP) Evaluation Baseline Survey' by Jesse McConnell and David Megill

[2] An attempted interview is considered when the interviewer tries to locate the respondent without success (e.g. knocking at the door and getting no positive response or any response at all). For the CS and INP Household Baseline Surveys, a limit of three attempts was established before discarding a household.

1. Introduction

The current Millennium Challenge Corporation (MCC) Compact with the Republic of Namibia aims to reduce poverty through economic growth in the education, tourism and agriculture sectors. As part of the tourism component of the Compact, the goal of the Conservancy Support (CS) Activity is to develop the capacity of 31 communal conservancies to attract investments in ecotourism and capture a greater share of tourism-generated revenue in Namibia. The Indigenous Natural Products (INP) Activity's Producer and Processor Organisations (PPO) intervention, which is also part of the Agricultural component of the Compact, will assist PPOs to improve their volume, quality, and value-added products, in addition to their organisational and business capacity.

As part of these activities, NORC has been contracted by MCA-Namibia (MCA-N) to implement a 'Conservancy Support and Indigenous Natural Products Household and Organisational Survey; NORC in turn, partnered with a local subcontractor, Survey Warehouse, to carry out the related fieldwork. The specific objectives of this survey project were to conduct a baseline survey for the CS and INP Activities in selected conservancies and PPO coverage areas and to produce clean datasets that cover households and communities affected by the CS and INP Activities. The data from this survey are intended for baseline and longitudinal project monitoring. In addition, data will be used for an evaluation of the CS and INP Activities; the evaluation will also incorporate related grant funding and other activities. Of particular interest are effects on household income levels and their relationship to the interventions. Since significant changes in income may only be detectable over the long run, great care is taken to examine intermediate outcomes as identified by intervention implementers and the Compact's program logic.

This baseline analysis report builds upon the previously submitted baseline survey report. Whereas the baseline survey report summarized accomplishments of the survey effort and presented some main findings, this baseline analysis report will provide a more thorough analysis of key relationships among PPO and conservancy households as well as delve more deeply into the limitations of the current dataset.

Methods applied for analysis

The methodology for analysis in this report examines issues of interest to MCA-N and stakeholders, particularly in the conservancy and INP sectors and is suitable for a one-period, cross-sectional descriptive study. While the primary purpose of the Conservancy Support and Indigenous Natural Products Household and Organisational Baseline Surveys (henceforth, the "Surveys") is to create a base-line for the impact evaluation, MCA-Namibia rightly understood that the baseline data itself could reveal important stylized facts for MCA policy formulation as well as for the implementers with which it is collaborating. Examples include whether there is a link between better governance and greater economic benefits for member households, whether younger household members are getting involved

in the organizations the MCA is supporting, and whether female-headed as well as poorer households are getting their fair share of benefits from the Compact's intervention. The methods selected must also speak to the quality of an array of key variables to serve as short-, medium-, and long-run indicators of project impacts on outputs and outcomes. Finally, the baseline data can be used to fine-tune preparatory steps in the sampling design of a midline (previously known as the mini survey) survey to be used to collect data from that part of the target population that was missed in the administration of the original baseline.

To meet these goals, we have chosen to examine a series of bivariate and trivariate relationships believed to elucidate many of the key issues discussed above as well as the seven principal research questions. While such relationships can easily be presented in tables of two- and three-level cross-tabulations, correlation does not imply causation. Hence, pending the impact evaluation, this report uses the correlations—"stylized facts" as they are often called—to formulate hypotheses and to create analytic narratives (stories consistent with household or organisational behavior and interests) to address the issues raised during the team's field trips and from the implementer publications.

As mentioned, a critical aspect of the present report is to determine whether the survey has been successful in measuring indicators of key outcomes whose attribution to the Compact intervention is the goal of the later impact evaluation. Measuring household standard of living is one of the hardest aspects of survey implementation. Done right, it is very expensive for the sponsor and time consuming for the respondent. Hence, survey designers try to strike a balance between expense and time, on the one hand, and inaccuracy, on the other. MCC emphasizes household income as one of the key impact measure of its interventions. Unfortunately, among the measures of household standards of living, income is the most difficult to pin down. To address these challenges, NORC has employed a multi-facetted strategy:

- We designed a short-form module for the questionnaire rather than use either a daily journal or a long-form (exhaustive) module.
- We evaluate the usefulness of the Survey's estimates of measures of household living standards by "triangulating" our estimates of household income, expenditure, and asset ownership—that is, we draw conclusions only when there is consistency among the three measures, rather than placing the entire burden of proof on any one measure alone.
- We compare the CS-INP estimates of household living standards to estimates from other surveys.

The primary application of this last point is the comparison of the CS-INP expenditure-based measure of household standard of living to those estimated by the NHIES of 2003/2004. Of course, the CS-INP populations are not directly commensurate with the Namibian population at large to which the NHIES study was administered. Still, its results may be adjusted and roughly compared to those of the present study. If consistent, it should provide some comfort that the new estimates are reasonable.

Toward this end, three concrete adjustments are made to the NHIES data. First, CS-INP data is of rural households and the NHIES sample was proportionate to the urban and rural mix of the Namibian population. Therefore we use the NHIES estimates of the relative size of the rural population as well as the share of income contributed by the rural sector nationally to adjust the NHIES regional household standard-of-living figures so as to make them more comparable to the households within conservancies and PPOs which are predominantly rural. [3] Second, the NHIES estimates are for 2003/4 whereas the CS-INP estimates are for 2011. Hence we use a currency deflator (CPI) to inflate the NHIES estimates to increase comparability with those of the CS-INP survey.[4] Finally, the NHIES used a more elaborate survey methodology (long forms and daily journals) to collect household expenditure information whereas the CS-INP instrument used shorter modules. International experimental evidence in the literature suggests that such approaches can underestimate true household consumption from 27 to 40 percent.[5] Hence, when comparing the CS-INP survey household consumption estimates to those of the NHIES, the latter need to be adjusted downward. In the sections on estimates of household standard of living we make comparisons at the regional level using the product of these three factors: 1.43 for inflation, 0.63 to remove the urban contribution, and 1.35 to compensate for an abridged standard of living survey module. The net effect is to reduce NHIES estimates by 66 percent.

In addition to these techniques, since the ultimate purpose of the CS-INP surveys is for MCA's impact evaluation, what matters is having "stable" ("reliable" in the statistical sense) estimates of household living standards, not "true" estimates. This is because the goal of impact evaluation is to attribute *changes* in living standards over the evaluation period, not levels. Whether the living standards indicator measures absolute "truth" is thus not critical, as long as the indicator under- or over-estimates true values consistently over time.[6] In the following chapters, therefore, we examine the degree to which the Survey has generated stable estimates of living standards. This is done in several ways:

- Comparing the width of the 95-percent confidence interval of an estimate and the size of standard deviations of estimates (see Sections 3 and 4 for statistical analysis) to the estimate itself. If the former is large relative to the latter then it indicates that the estimate may not be reliable, may lead to Type-I or Type-II errors of inference, or that the estimates should be computed using a larger subsample.

[3] Mathematically, letting be the average household income, be the average rural household income in region, *r*, and be the average household income in region, *r*, then , where and = 27,792 NAD and where = 66,625 NAD, μ is the rural (R) and urban (U) population share nationally (59.5% and 40.5%) . The are given in Table 23 and all just-mentioned NAD figures come from NHIES (2006).

[4] The CPI figures used come from http://www.gocurrency.com/countries/namibia.

[5] See, e.g., Deaton and Muellbauer, 1980, *Economics and consumer behavior*, New York, Cambridge University Press; Deaton, Angus S., 1997*, The Analysis of Household Surveys: Microeconometric Analysis for Development Policy*, Baltimore, Maryland, Johns Hopkins University Press; Deaton and Zaidi, 2001, "Guidelines for Constructing Consumption Aggregates for Welfare Analysis", working paper, The World Bank.

[6] For example, if *T* is the true value of a household's standard of living and *R* consistently underestimates *T* by 10 percent then *R*(endline)/*R*(baseline) = [*T*(endline)*0.9] / [*T*(baseline)*0.9] = *T*(endline)/*T*(baseline). Thus, *R* still reveals the true percentage change in the household's standard of living.

- Running hypothesis tests (see Sections 3 and 4 for statistical analysis), generally using chi-based, t-, and p-statistics to examine whether indicator estimates for a group of observational units are either different from zero or different from other groups of observational units of interest.

Lastly, in interpreting the material that follows note that:

- All tables in the report are population-weighted (up to either the 28 conservancies or the 18 PPOs) unless otherwise stated.
- All nominal values are denominated in 2011 Namibian dollars unless otherwise stated.
- Where possible we note when estimates are unlikely to be reliable due to a small sub-sample underpinning them.
- When table figures have been computed with outliers removed, this is indicated as a table note together with the number of observations removed or the filtering criteria.

2. Baseline Survey Methodology and Sampling

The purpose of the CS/INP survey was to collect data for the CS and INP activities for reporting against indicators in the MCA-N Monitoring and Evaluation Plan as well as to establish a baseline for the purpose of the evaluation. The data may also be used to assess the impact of these activities on income, employment, production and other factors. The primary objective of the Survey was to achieve a high level of precision and power for analytical, rather than descriptive, purposes, but the survey design can also be considered useful for constructing descriptive estimates for populations of interest.

This project involves administering surveys at several points in time: a baseline conducted in 2011, a midline planned for early 2013 (previously known as the mini survey), and an optional end-of-project survey in 2014. The target sample size for the baseline survey was 1,500 household interviews, of which 1,000 were for the CS Activity and 500 were for the INP Activity. It is desired that the data analyses be able to show the relationship of income, employment, production, and other factors to explanatory variables, such as gender, age, home language, conservancy, status as a vulnerable group, and plant species.

For detailed information on the sampling design and methodology refer to *CS/INP Final Survey Design Report (2011)*. The following is a brief summary of the methodology used.

2.1 Baseline survey methodology

For the CS Activity, the sample design was a two-stage sample in which the first-stage sample units were Enumeration Areas (EAs) in conservancies and the second-stage sample units were households. In the case of the CS survey design, the primary sampling unit was the Census EA (which overlaps with the conservancy), and a number of variables were known (from Census and GIS sources) for each EA (or the constituency in which an EA was located) that could be used to assist sample design.

For the INP activity, the sample design was comprised of households selected from the list of PPO producers (which includes households both inside and outside Conservancies). For selecting the producers on the PPO list, the sample design was originally intended to be a two-stage design in which the first-stage sample units were communities on the PPO list (usually villages) and the second-stage sample units were households within the selected communities. As it turned out, it was not possible to obtain community names or locations for many of the producers in the INP sampling frame, so it was not practical to implement the original concept of selecting a two-stage sample for the INP survey. In fact, few variables were available in the PPO sampling frame that could be used to construct an analytical survey design.

In the INP sampling frame, the PPO name was known for each producer, but not the community (EA or village). Apart from PPO, the only variable useful for constructing an analytical design was INP species.

For this reason, it was not possible to construct an analytical design. Instead, it was decided to select a stratified single-stage sample from the frame, where stratification would be by INP species. We do not currently believe that the change in sampling procedure had a negative impact on the final outcomes.[7]

2.2 Sampling issues and limitations

Although an independent review of the CS/INP data by Oxford Policy Management found good data quality, it is important to highlight some of the limitations in the current dataset, particularly for the INP component. These limitations fall broadly into two categories: sampling frame issues and in-field data collection issues. Both issues will affect the final evaluation of the CS/INP activity and are important to consider in turn.

CS data collection

Overall, 1,032 interviews were completed from an initial target of 1,188 interviews (although NORC was contractually required to complete 1,000 interviews). The sampling was based on an in-field sampling methodology in which EAs overlapping with conservancy boundaries were selected, two random starting points were selected within each selected EA, and six households were selected for each random starting point (from each starting point, every fifth household was selected). This methodology was used because we did not have lists of households for each conservancy and it was not feasible to carry out a listing exercise in each sampled EA. We therefore did not have a sample of households before starting fieldwork; instead enumerators selected households based on a step-wise method using a systematic walk pattern from the random starting point. When a household was absent, interviewers went to the next available household but did not document the households that they attempted to interview and which were unsuccessful. This oversight made it difficult to calculate an accurate response rate based on the total number of attempted interviews. In addition, three EAs in Impalila Conservancy could not be reached as the only way to access Impalila Conservancy, located on Impalila Island, is through Botswana.

There were 99 EAs in the sample (102 minus the 3 EAs in Impalila conservancy which were not reachable) and a target number of 12 interviews in each EA. The total target sample size was thus 1,188 (12 x 99). We can use this target sample as a proxy for calculating the response rate. With these assumptions, the response rate would be: 1,032/1,188 = 86.9%.

Overall, the CS data is strong and the sampling and field errors that were encountered will not impact our ability to use this data for the final evaluation.

[7] For a detailed discussion of the survey design and its impact on the final dataset please refer to the Final Survey Design Report (August 2011).

INP data collection

Overall, 296 interviews were completed out of 631 attempted interviews. NORC was asked to complete 500 total INP surveys. However, given the problems with the initial frame as well as seasonal issues, it proved impossible while conducting the fieldwork to reach this target.

Of the 631 households which were visited and interviews attempted, the cases of non-response were:

Reason	%	n
Out of scope (household does not harvest/sell INPs)	20.5	129
No. household member or competent respondent at home	25.4	160
Entire household absent for extended period	7.0	44

The number of eligible interviews, i.e., excluding out of scope households, is thus 502. The overall response rate based on the households within scope is: 296/502 = 59.0%.

As explained earlier, there were several issues with the INP sample, which explain the low response rate:

- The sample frame was compiled from membership lists dating back to 2009. Many of the members on those lists were either no longer involved in INP related income generating activities, or abandoned their place of residence. The most affected regions were Caprivi, Kunene North and Ohangwena.
- Many harvesters in the Caprivi and Otjozondjupa regions were at mobile bush camps, which were largely untraceable as small clusters of individuals, rather than organised groups harvested together. These groups only spent a day or two in an area before moving to new harvesting grounds. This made it nearly impossible for survey teams to track them down.

Sample frame challenges. Locating sampled respondents for the INP component of the survey severely delayed the timely completion of the data collection activity. As the lists of registered harvesters from the PPOs were compiled from membership during 2009, and given the reality that producers do not necessarily participate in production each year, listed producers were not always active at the time of the survey. The data collection teams observed that most of the sampled people were no longer members of their respective PPOs. They were either no longer involved in INP-related income generating activities, or had abandoned their registered place of residence. The most affected regions were Caprivi, Kunene North and Ohangwena.

Unlocatable households. Locating sampled members of respective PPOs in the Caprivi and Otjozondjupa regions was affected by the timing of the survey implementation, where data collection activities overlapped with harvesting activities for Devil's Claw. The field teams learned that most of the harvesters were at mobile bush-camps, which were largely untraceable as small clusters of two to five individuals (rather than organised groups harvested together). These groups were mobile, spending only

a day to two in an area before moving on to new harvesting grounds. This type of movement by targeted respondents made it nearly impossible for survey teams to track them down for interviews.

The following two tables give more details on the sample:

Table 1: Original target sample

INP Species	Region								*Total*
	Caprivi	Kunene	Ohang-Wena	Oma-heke	Omusati	Oshana	Oshi-koto	Otjozon-djupa	
Commiphora									
Original target	0	63	0	0	0	0	0	0	*63*
Actual achieved	0	0	0	0	0	0	0	0	*0*
Devil's Claw									
Original target	93	0	0	12	0	0	0	45	*150*
Actual achieved	36	0	0	12	0	0	0	11	*59*
Marula									
Original target	0	0	98	0	29	19	29	0	*175*
Actual achieved	0	0	77	0	45	19	27	0	*168*
Mopane									
Original target	0	42	0	0	0	0	0	0	*42*
Actual achieved	0	0	0	0	0	0	0	0	*0*
Ximenia									
Original target	0	0	70	0	0	0	0	0	*70*
Actual achieved	0	0	69	0	0	0	0	0	*69*
Total									
Original target	*93*	*105*	*168*	*12*	*29*	*19*	*29*	*45*	*500*
Actual achieved	*36*	*0*	*146*	*12*	*45*	*19*	*27*	*11*	*296*

The table above shows that of the five INP species in our sample, both Commiphora and Mopane are missing from our sample entirely. Compared to the original sample design, this has the effect of also resulting in no representation of the Kunene region in our sample, as this is the only region in our sample where these INP species are located. Additionally, as noted above, because the timing of the survey coincided with the harvesting season for Devil's Claw, the level of representation for this INP species in our sample is about 40% of that in the sample design. This also has the effect of reducing the

level of representation in Caprivi and Otjozondjupa regions to about 40% and 25%, respectively, of the sample design level. These shortfalls in achieving the designed levels of representation imply that some additional data collection is needed to ensure adequate observations for these three INP species and their associated region in the overall set of baseline data to expand the validity of the impact evaluation within and across regions.

Maps have been provided as part of Appendices A and B showing the geographic spread of the current sample to better assess coverage issues.

3. An examination of the conservancy baseline data

The sample of conservancy households[8] includes 1,032 observations distributed across six regions in Namibia: Caprivi, Kavango, Kunene, Omusati, Oshikoto, and Otjozondjupa; almost half of them are located in Kunene. In all cases, weights to obtain representative estimate results have been used, unless other method indicated.

The distribution by gender of the household head is 43% female and 57% male-headed. The average age of the head of household is 50 years, and the average household size is five members without considerable variation between genders. By gender, 36% of female heads of household never completed any academic grade or level, the highest level or grade for 29% of them was any level of primary school and any level of secondary school for 33% of them. When it comes to male-headed households, 30% of their heads never completed any academic grade or level, for 37% of them the highest grade or level they completed was any in primary school, and 30% completed any level or grade in secondary school.

Most conservancy households, 79%, are composed of registered members of conservancies, and more than half of them are male-headed. Regarding conservancy benefits distribution, 15% of all conservancy households received cash benefits, 40% received non-cash benefits, and 10% received at least one type of cash benefits and at least one type of non-cash benefits. Further, this section also analyses the economic activities of conservancy households. From 1,032 sampled households (without survey weights), just 25 harvest indigenous natural products[9], 45% harvest other crops in their own farms, 79% take care of animals, 8.9% earn income from conservancy activities, 22% earn income from wages, 15.4% have at least one member that owns a business, and 60% receive any sort of non-labor income.

The sample displays a wide variation of household income, expenditures and assets. A detailed analysis of these indicators of wealth framed by demographic characteristics, region, conservancy, economic activities and participation in conservancy meetings will explain differences in wealth conditions across subgroups.

In addition, only 8% of conservancy households reported any participation of their members in trainings brought by conservancies in the last 12 months before the data was collected in 2011. This finding is understandable given that the CS intervention trainings are focused at the institutional level.

3.1. Composition of the conservancy households

[8] Household is defined as a group of people with a shared kitchen who eat at least 5 meals together per week.
[9] The indigenous natural products considered in the data collection instrument are: devil's claw, marula, ximenia, mopane seeds, and commiphora resin.

The sample of conservancy households includes 43% female headed and 57% male headed households. On average, the household size is around 6 members (5 for female-headed households, and 6 for male-headed ones).

A larger proportion of male-headed households reported having no children than female-headed ones (24% of male-headed households vs. 15% of female-headed households; $p<0.01$). Although not statistically significant, more female-headed households have less than three children, 40% of them, while only 28% of male-headed households reported that range of children. Furthermore, a similar proportion of both kind of households (between 36 and 39%) reported having between 3 and 5 children ($p< 0.1$). Households with more than 5 children are not common in either male or female-headed households.

Table 2: Number of children in the household, by head of household's gender (percent)

Number of children	All	Female head of household	Male head of household
No children	20	15	24
With less than 3 children	33	40	28
With 3-5 children	38	36	39
With 6-7 children	6	6	6
With more than 7 children	3	4	3
Total	*100*	*100*	*100*

Note: Columns may not total to 100 due to rounding.

Number of children in the household, by head of household's gender (percent)

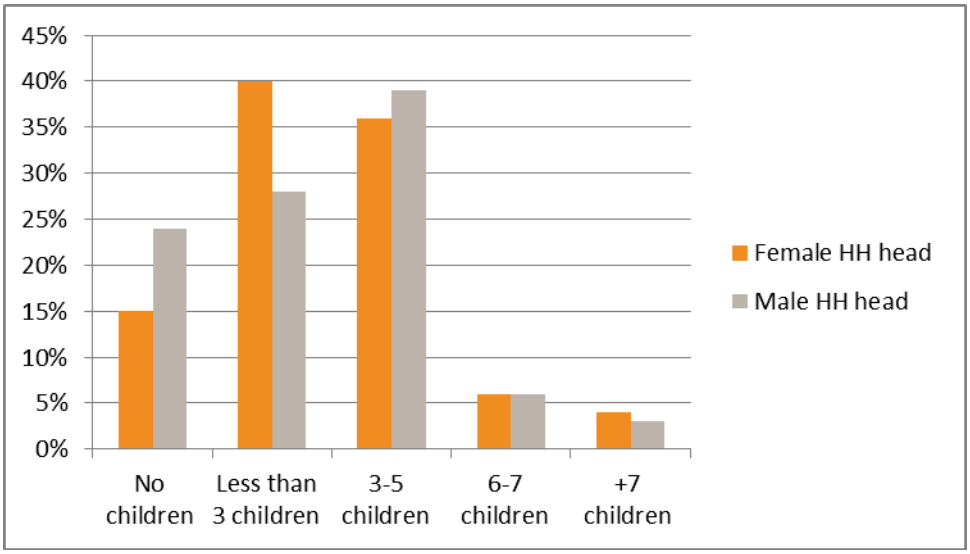


Table 3 displays the distribution of the highest school level or grade completed by the household head and by gender. The group of male heads completed any primary level at a higher rate than female heads

of household (37 vs. 29%; p<0.01). The differences between household heads' genders within the remaining academic levels resulted not statistically significant.

Table 3: Education of the head of household, by gender (percent)

Highest level completed	All	Female head of household	Male head of household
Pre-school and primary	33.6	29.1	37.0
Secondary	31.3	32.7	30.3
Vocational / technical	0.4	0.1	0.6
University	1.5	0.9	2.0
Other post-secondary	0.5	0.8	0.2
Adult education	0.3	0.6	0.0
Never completed a grade or level	32.4	35.9	29.9
Total	*100.0*	*100.0*	*100.0*

Note: Columns may not total to 100 due to rounding.

Education of the head of household, by gender (percent)

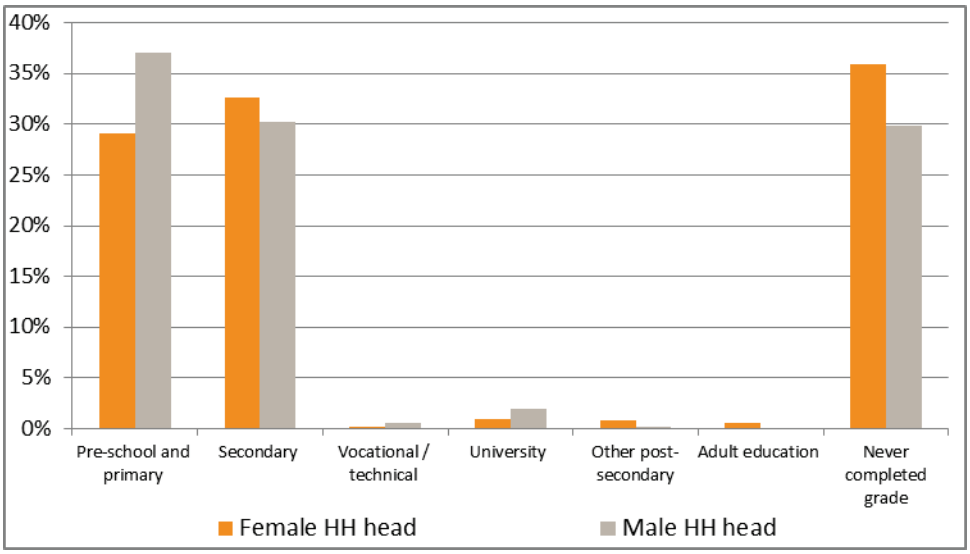


Table 4 presents the distribution of households by language spoken at home and gender of head of household. The distribution of households by language and gender of the household head in the sample is quite even; the differences between heads' gender do not exceed 5 percentage points, even in the most notable cases, Silozi-, Rukavango- and Khoisan–speaking households (p<0.1). The remaining differences of language between household-head genders are not statistically significant. Furthermore, there are no English-speaking female-headed households, and the proportion of English-speaking male-headed households is quite small (0.5%).

Table 4: Main language spoken at home, by head of household's gender (%)[10]

Language	All	Female head of household	Male head of household
Silozi	30	27	32
Afrikaans	1	0	2
Rukavango	7	5	10
Otjiherero	14	16	11
Khoisan	3	1	5
Oshiwambo	31	37	27
Damara/Nama	12	13	12
English	0	0	1
Other	1	1	0
Total	*100*	*100*	*100*

Note: Columns may not total to 100 due to rounding.

When it comes to households' distribution by the age of the household head, the mean and median ages were similar between genders, about 48.5 and 46.5 respectively. As Table 5 displays, most male heads of household are in the 35-49 year-old segment (36%) which denotes that a considerable fraction of them are still in an economically active age. The proportion of female-headed households in this age range is the highest for that group (28% of them) but still smaller than among male-headed households ($p<0.01$). Although statistically insignificant, the second largest age segment is composed by household heads older than 65%, they represent 26.6% of female household heads, and 22.4% of their male counterparts.

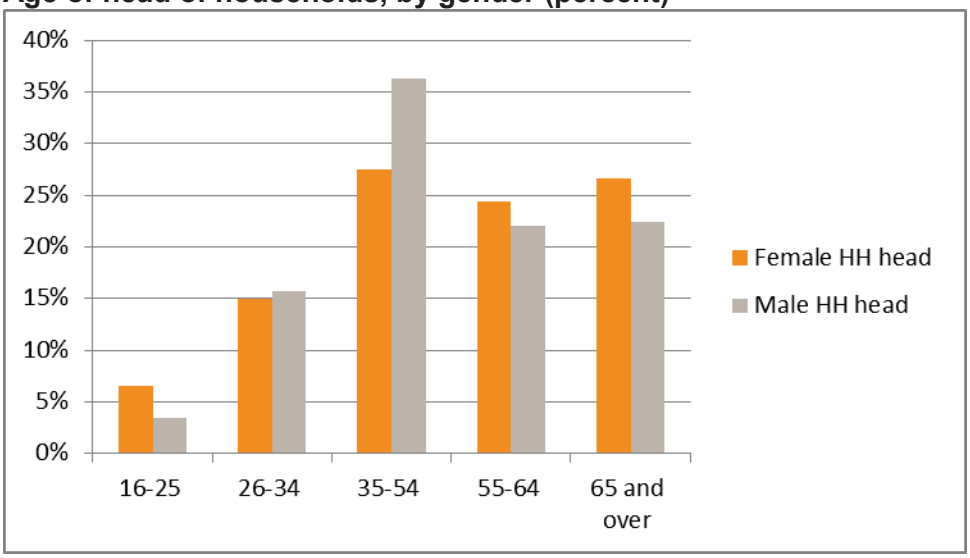
Table 5: Age of head of households, by gender (percent)

Age range	All	Female head of household	Male head of household
16-25	4.8	6.5	3.5
26-34	15.7	15.0	15.7
35-54	33.1	27.5	36.3
55-64	21.7	24.4	22.1
65 and over	24.6	26.6	22.4
Total	*100.0*	*100.0*	*100.0*

Note: Columns may not total to 100 due to rounding.

[10] 14% of conservancies are predominantly Oshiwambo-speaking and 45% are Otjiherero- or Nama/Damara-speaking, compared to 31% and 26%, respectively, of the survey sample. Language group was not a sampling criterion agreed upon and these divergences reflect this fact. Language-group-weighted results could be computed for those groups in the baseline CS sample, however.

Age of head of households, by gender (percent)



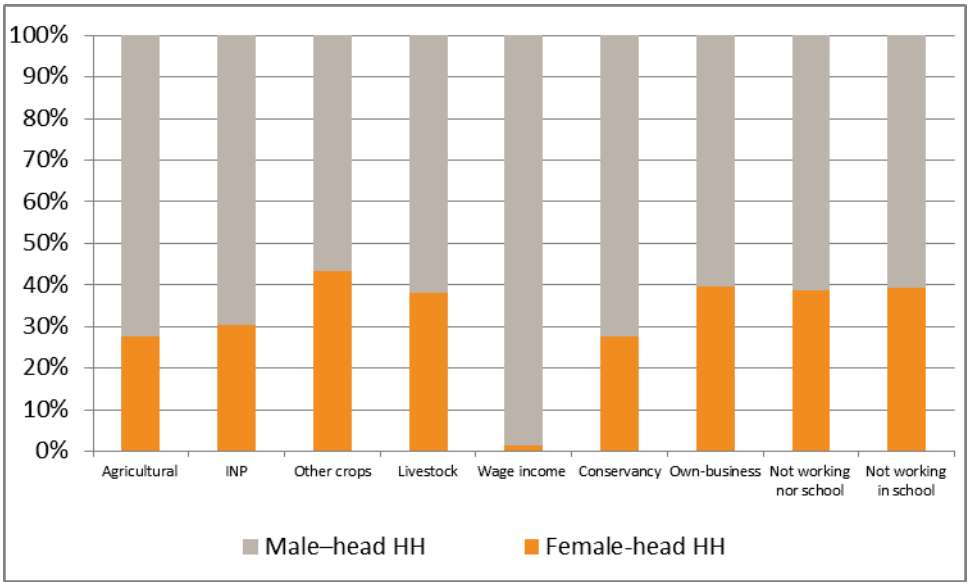
Members older than 16 years old whose households are male-headed represent a larger proportion of individuals that engage in all economic activities than those whose household heads are females. Table 6 indicates the substantial differences in participation rates between households according to their heads' gender. These differences are statistically significant almost for all economic activities or sources of income: agricultural activities in general ($p<0.1$), wages ($p<0.01$), conservancy-related activities ($p<0.01$), and those who were not working but attended school ($p<0.05$). In addition, the share of households whose head are females and receive income from wages is quite marginal, 1.4%, compared to the male-headed households, 98.6% ($p<0.01$).

Table 6: Labour activity of household members over 16 years old, by gender (percent)

Labour status	Female-head HH	Male–head HH	Total
Agricultural	27.5	72.5	100.0
INP-related activities	30.5	69.5	100.0
Other crops	43.4	56.6	100.0
Small and large stock	38.2	61.8	100.0
Wage income	1.4	98.6	100.0
Conservancy-related activities	27.5	72.5	100.0
Own-business activities	39.7	60.3	100.0
Not working nor attending school	38.6	61.4	100.0
Not working but in school	39.4	60.6	100.0

Table entries indicate the percent of household members that engage in the row activity. 3.6% of household members reported more than one economic activity.

Labour activity of household members over 16 years old, by gender (percent)



3.2. Participation in conservancies and perceived benefits

Not all households in the sample receive benefits from the conservancy. From the sample, the percentages of conservancy households that receive conservancy benefits by type are: cash (15%), non-cash (40%), and at least one cash type of benefit plus at least one type of non-cash benefits (11%).

Table 7 displays the percentage of female-headed and male-headed households that received each type of benefit. In general, a larger proportion of male-headed households receive cash benefits and non-cash benefits than female-headed households ($p<0.05$). However, a fairly similar proportion of female- and male-headed households receive at least one type of cash benefits plus at least one type of non-cash benefits, 9 and 13% respectively.

Table 7: Conservancy benefits received, by head of household's gender (percent)

Type of benefits	Female	Male	All
Cash benefits	11	18	15
Non-cash benefits	34	44	40
Cash and in-cash benefits*	9	13	11

Notes: Benefits are *not* mutually exclusive in this table since households could receive more than one type of in-kind conservancy benefit. *Households receiving at least one cash type of benefits plus at least one non-cash type of benefits at the same time. Also, averages are only over non-zero values.

Conservancy benefits received, by head of household's gender (percent)

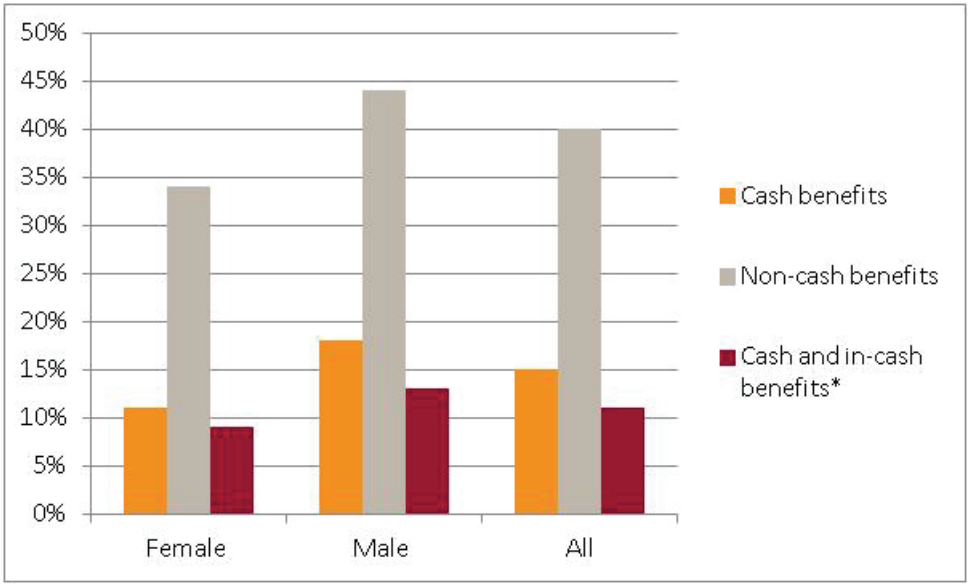
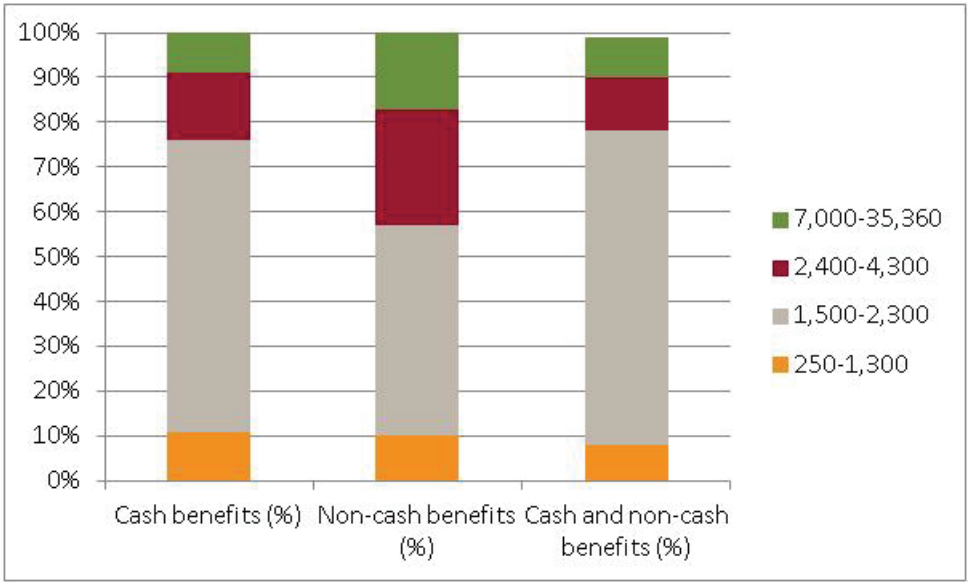


Table 8 displays the percentage of conservancy households that received benefits from the conservancies by the size of the conservancy they belong to. It would be expected that largest conservancies would concentrate the most benefits. However, this was only the case for non-cash benefits whose highest participation of households concentrates in the segment of conservancies over 7,000 members, although on a not statistically significant fashion. In contrast, most recipients of both cash and non-cash benefits are located in conservancies that have between 1,500 and 2,300 members, especially those that received both cash and in-kind benefits, for which the concentration in that segment reaches 68% of those household recipients ($p<0.01$).

Table 8: Distribution of conservancy benefits, by size of conservancy (%)

Population size	# conservancies	Cash benefits (%)	Non-cash benefits (%)	Cash and non-cash benefits (%)**
250-1,300	7	11	10	8
1,500-2,300	8	65	47	70
2,400-4,300	7	15	26	12
7,000-35,360	6	9	20	9
Total	*28*	*100*	*100*	*100*

Notes: Percentages of all households in membership size range that receive benefit type. Columns may not total to 100 due to rounding. Benefits are *not* mutually exclusive in this table. *Sampled conservancies.**Households receiving at least one cash type of benefits plus at least one non-cash type of benefits at the same time. Also, averages are only over non-zero values.



According to Table 9, the distribution of conservancy benefits differs across households according to the heads' gender, and the household expenditures quartile. First, the distribution of cash benefits for both, female-headed and male-headed households is not statistically significant; even though, the participation rate of female-headed households in quartile one is very modest (3%), and in quartile two it is considerably higher than for any other quartile and compared to the male-headed households (64%). In contrast, the proportion of male-headed households receiving conservancy benefits was more homogenous across expense quartiles than for the female-headed households.

Furthermore, the distribution of non-cash benefits for female- and male-headed households is quite similar, except for the second quartile ($p<0.05$), in which 40% of female-headed recipient households are included vs. 28% of male-headed recipient households, and for the difference between quartile IV male-headed households that contains 27% of non-cash beneficiaries v. only 13% of female-headed households that received non-cash benefits.

In addition, the distribution of households that receive both cash and non-cash benefits registers differences according to their heads' gender that resulted not statistically significant, except for households in quartile IV ($p<0.01$). As displayed in Table 9, female-headed households registered a more unequal distribution when compared to male-headed households in this segment ($p<0.05$); the largest proportion of female-headed households that received both cash and non-cash benefits was concentrated in the second quartile (66% of female-headed households that receive both types), and the smallest in the first quartile (4%). In contrast, the distribution of households that received both cash and non-cash benefits among male-headed household recipients is more even and registers a moderate progressive character, including more households from the three lowest quartiles compared to the highest one ($p<0.05$).

Table 9: Conservancy benefits, by expenditures quartile and head of household's gender (percent)

Head of household's gender / type of benefits	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Total
All					
Cash benefits	19	36	28	17	100
Non-cash benefits	24	33	22	21	100
Cash and non-cash benefits*	18	46	20	16	100
Female					
Cash benefits	3	64	19	14	100
Non-cash benefits	24	40	23	13	100
Cash and non-cash benefits*	4	75	15	6	100
Male					
Cash benefits	26	23	33	18	100
Non-cash benefits	24	28	21	27	100
Cash and non-cash benefits*	25	31	23	21	100

Note: Averages are only over non-zero values.

*Households receiving at least one type of cash benefits plus at least one type of non-cash benefits at the same time.

Overall, the average values of all conservancy benefits for all households in Table 10 register a direct relationship with household expenditures, although this relationship is not statistically significant for any type of conservancy benefits and household head gender. Between household-head genders, the average amount of cash benefits that female-headed households received from the first quartile represents less than a half of the average amount of cash benefits received by male-headed households from the same quartile ($p<0.05$). The remaining differences across the highest three quartiles are not statistically significant.

Table 10: Conservancy benefits, by expenditures quartile and type of benefits (mean NAD)

Head of household's gender / type of benefits	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Household average
All					
Cash benefits	699	525	726	955	687
Non-cash benefits	196	278	282	369	279
Cash and non-cash benefits*	598	155	1378	953	620
Female					
Cash benefits	320	791	207	601	640
Non-cash benefits	226	413	419	309	355
Cash and non-cashbenefits*	1214	148	336	1008	359
Male					
Cash benefits	724	165	867	1,091	710
Non-cash benefits	177	170	196	387	235
Cash and non-cash benefits*	546	164	1711	900	780

Note: Averages are only over non-zero values.

*Households receiving at least one type of cash benefits plus at least one type of non-cash benefits at the same time. Outlier observations two times larger the mean were not considered

In spite of the lack of statistical significance in the difference in mean value of benefits between those households whose members attend and do not attend conservancy annual general meetings (AGMs), Table 11 indicates that on average, those households that participated did received larger amounts of cash benefits and non-cash benefits than those who did not.

Table 11: Conservancy benefits, by households' participation in the annual general meeting in the conservancy (mean NAD)

AGM participation	Total benefits*	Cash benefits	Non-cash benefits**	Cash and non-cash benefits***
Yes	560	926	272	1347
No	286	182	300	332
Total	*475*	*739*	*286*	*1,059*

Note: Averages are only over non-zero values.

*Total benefits refer to average household benefits from all conservancy sources.

** Non-cash benefits include: food, fuel, transportation, support for ceremonies, and non-game natural resources.

***Households receiving at least one type of cash benefits plus at least one type of non-cash benefit at the same time.

Table 12 displays the distribution of conservancy benefits by language spoken at the household. In general, Silozi-speaking households represent the largest proportion of households that receive cash benefits (48%), and cash plus at least one type of non-cash of benefits (56%; $p<0.01$). Interestingly, only 30% of conservancy households are composed of households that reported speaking Silozi (see Table 4). In contrast, the other linguistic group that shares a similar proportion of conservancy households is that of Oshiwambo speakers (31% of the sample) but they only represent 9% of cash benefits recipient households and 9% of those households that receive both cash and non-cash benefits ($p<0.01$).

Table 12: Distribution of conservancy benefits, by type and household language (pct.)

Language	Cash benefits	Non-cash benefits	Cash and non-cash benefits*
Silozi	48	43	56
Afrikaans	3	2	3
Rukavango	13	13	16
Otjiherero	3	16	3
Khoisan	11	5	8
Oshiwambo	9	11	9
Damara/Nama	11	11	8
English	1	0	0
Other	1	0	1
Total	100	100	100

Note: Averages are only over non-zero values. *Households receiving at least one type of cash benefit plus at least one type of non-cash benefit at the same time.

Table 13: Distribution of conservancy benefits, by type and conservancy (percent)

Conservancy	Cash benefits	Non-cash benefits	Cash and non-cash benefits*	No benefits
Orupembe	2	42	2	52
Sanitatas	0	55	0	45
Ehirovipuka	6	50	6	47
Omatendeka	13	100	13	0
Sesfontein	0	20	0	78
Torra	32	94	32	6
Puros	2	100	2	0
Anabeb	5	57	5	43
Marienfluss	4	59	4	32
Uukolonkadi-Ruacana	0	13	0	82
Doro !Nawas	7	47	7	53
Uibasen (Twyfelfon-tein-Uibasen)	50	28	18	40
Khoadi Hoas	6	18	2	16
Sorris Sorris	0	17	0	83
Uukwaluudhi	11	65	11	29
Sheya Shuushona	0	17	0	83
King Nehale	12	12	8	75
Muduva Nyangana	17	74	17	23
George Mukoya	83	75	67	8
Nyae Nyae	69	38	34	25
N#a-Jaqna	0	68	0	27
Kwando	13	63	8	32
Mayuni	12	25	7	70
Mashi	17	50	8	42
Wuparo	50	90	41	1
Balyerwa	58	100	58	0
Sikunga	50	75	33	8
Salambala	0	21	0	79

Note: Averages are only over non-zero values.
*Households receiving cash plus at least one non-cash benefit at the same time.

Table 13 and Table 14 show the share of the total value and average amount, respectively, for a benefit category going to each conservancy. The distribution of these benefits is quite diverse across the

perimeters. All conservancies registered at least one type of conservancy benefit and households in 7 conservancies only received non-cash benefits, as it is the case of Sanitatas, Sesfontein, Uukolonkadi-Ruacana, Sorris Sorris, Sheya Shuushona, and Salamabala. Households in all the 28 conservancies declared they received at least one type of non-cash benefits, and in three of them—Omatendeka, Puros and Balyerwa—100% of respondent households received non-cash ones. In only 7 out of 28 conservancies, less than 30% of sample households, received this type of benefits ($p<0.01$). Cash benefits were, in general, received by a smaller proportion of households, although in George Mukoya, Wuparo and Balyerwa, they were received by more than 50% of them; in George Mukoya, almost 83% declared they received cash benefits. Finally, the percentage of households that did not receive any type of benefit is shown in the last column.

Finally, recipient households of cash-plus-non-cash benefits are registered in 15 conservancies with percentages between 1 and 25%. However, the conservancies of George Muyoka and Balyerwa stand out with 67 and 58% of households, respectively, receiving both types of benefits, cash and non-cash = ($p<0.05$).[11]

When it comes to the value of conservancy benefits, Table 14 displays the average amount of benefits by type across conservancies. Households in all conservancies reported being recipients of non-cash benefits, and only 21 conservancies received cash benefits. Although not statistically significant, in 11 conservancies out of the 22 that received cash benefits, the value of these transferences is larger than the value non-cash benefits. In addition, the average value of benefits among those households that receive cash plus non-cash benefits –in 18 conservancies- reached a range between 89 and 10,800 NAD, due to a high concentration in a few households at Marienfluss and Uibasen($p<0.01$). On average, the value of cash plus non-cash benefits that these specific households receive is almost two times as large as the average value of cash benefits, and more than four times as large as the average value of non-cash benefits in the entire sample.

[11] Interestingly, MCA-Namibia reports that there are no cash benefits within conservancies, but compensations. This issue will receive follow up on qualitative research.

Table 14: Conservancy benefits, by type and conservancy (mean NAD)

Conservancy	Cash benefits (mean)	Non-cash benefits (mean)*	Cash and in-kind (mean)**'***
Orupembe	-	266	-
Sanitatas	-	334	-
Ehirovipuka	500	922	-
Omatendeka	1,871	320	3,028
Sesfontein	-	149	-
Torra	1,023	1,240	3,295
Puros	900	1,226	1,900
Anabeb	50	112	500
Marienfluss	10,000	367	10,800
Uukolonkadi-Ruacana	340	354	-
Doro !Nawas	132	241	400
Uibasen (Twyfelfontein-Uibasen)	5,112	2,907	10,163
Khoadi Hoas	3,160	423	1,300
Sorris Sorris	-	2,000	-
Uukwaluudhi	1,450	434	-
Sheya Shuushona	-	175	-
King Nehale	200	314	-
Muduva Nyangana	705	93	632
George Mukoya	393	39	469
Nyae Nyae	514	634	1,070
N#a-Jaqna	-	251	-
Kwando	201	22	206
Mayuni	198	26	221
Mashi	110	17	250
Wuparo	78	8	89
Balyerwa	175	18	203
Sikunga	109	20	142
Salambala	40	22	-

Note: Averages are only over non-zero values.

* Non-cash benefits include: food, fuel, transportation, support for ceremonies, and non-game natural resources.
***Households receiving at least one type of cash benefit plus at least one type of non-cash benefit at the same time.

Table 15 shows the relationship between frequency of attendance to conservancy level meetings and the access to conservancy benefits. The frequency of attendance to these meetings would presumably imply better conservancy governance and/or greater salience of the conservancy in the lives of its members (e.g., a larger amount of benefits to distribute). Although not statistically significant as a whole, the frequency of attendance to conservancy-level meetings seems to be positively related to the proportion of participating households in non-cash benefits. Likewise, the last column (No Benefits) reveals a positive correlation between attendance at meetings and receipt of at least one type of conservancy benefit. Finally, we see that in all cases attendance to *some* meetings is associated with greater benefits, regardless of type, than no meeting attendance; households that reported no attendance to any of these meetings represent 70% of those households that received no conservancy benefits in the sample.

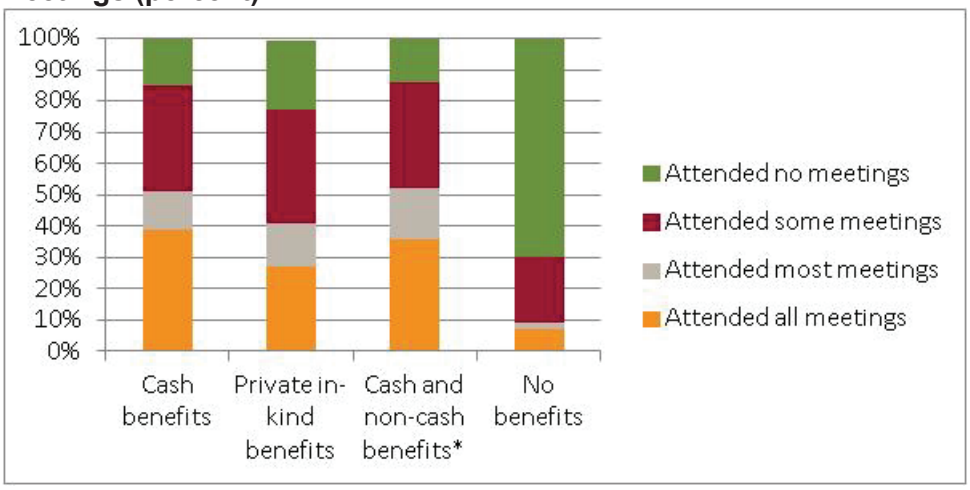
Table 15: Distribution of conservancy benefits, by frequency of attendance to conservancy level meetings (percent)

Frequency of attendance	Cash benefits	Private non-cash benefits	Cash and at least one type of non-cash benefits*	No benefits
Attended all meetings	39	27	36	7
Attended most meetings	12	14	16	2
Attended some meetings	34	36	34	21
Attended no meetings	15	22	14	70
Total	100	100	100	100

Note: Averages are only over non-zero values.

* Households receiving at least one type of cash benefit plus at least one type of non-cash benefits at the same time.

Distribution of conservancy benefits, by frequency of attendance to conservancy level meetings (percent)



The overall distribution of benefits value by the frequency of conservancy-meeting attendance displayed in Table 16 is also not statistically significant. is the fact that is statistically significant is that those

households who reported attending at least some conservancy meetings received, on average, higher average levels of benefits than those who reported not attending meetings.

Table 16: Conservancy benefits, by attendance to conservancy meetings and type of benefits (mean NAD)

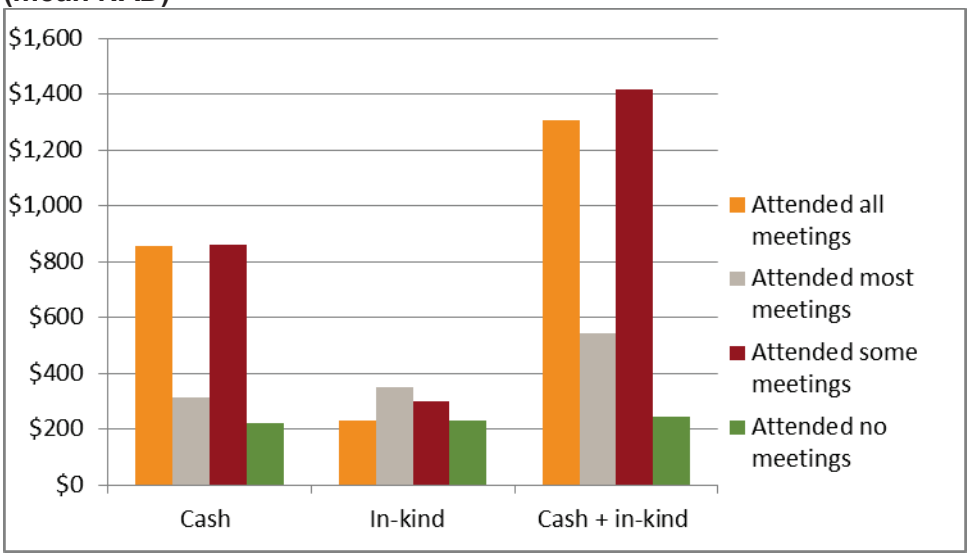
Conservancy membership range	Cash benefits (mean)	Non-cash benefits (mean)*	Cash and in-kind (mean)**
Attended all meetings	856	231	1,308
Attended most meetings	315	352	544
Attended some meetings	862	299	1,417
Attended no meetings	224	230	247
Total	739	286	931

Note: Averages are only over non-zero values.

*Includes non-cash benefits (food, fuel, transportation, support for ceremonies, and non-game natural resources).

**Households receiving at least one type of cash benefits plus at least one non-cash type of benefit at the same time. Outlier observations twice as large as the mean or larger were not considered.

Conservancy benefits, by attendance to conservancy meetings and type of benefits (mean NAD)



Considering the historical background and the governance role of conservancies, it would be expected that households located within the oldest conservancies would register higher rates of access to different types of benefits. In Table 17, the distribution of different types of conservancy benefits varies across cohorts of conservancy age. Hence, the oldest conservancies (10 years or older) have the largest share of households that receive cash benefits, non-cash benefits, and both cash and non-cash benefits ($p<0.05$). However, medium age households (9-11 years) hold smaller percentages of participation in all the conservancy benefits than the youngest conservancies (less than 9 years old). Further observation of

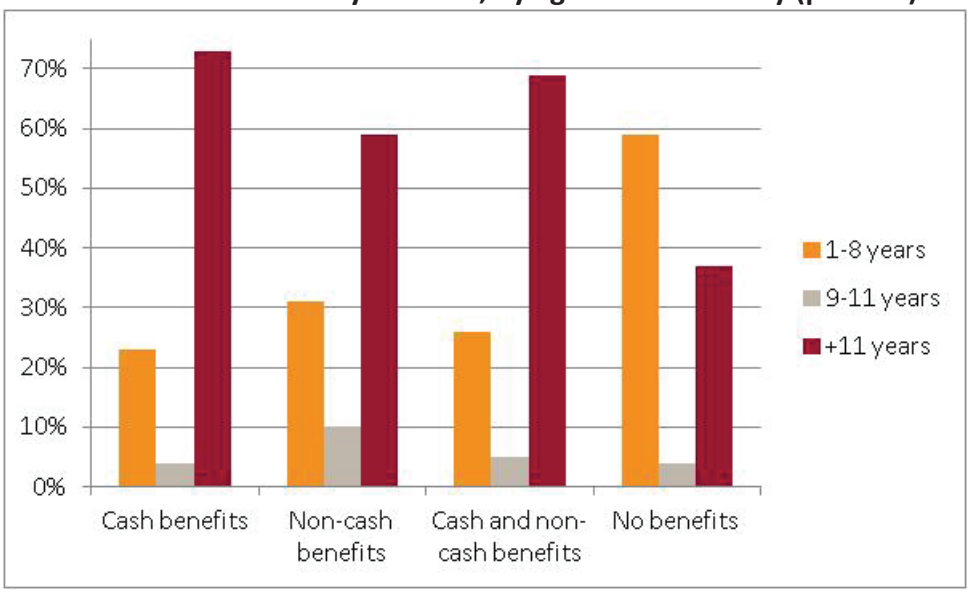
the distribution of benefits across groups of conservancy age through future qualitative and quantitative data collection could provide us with useful information to understand the reasons of this phenomenon.

Table 17: Distribution of conservancy benefits, by age of conservancy (percent)

Age of conservancy	Number of conservancies		Percent of households		
		Cash benefits	Non-cash benefits*	Cash and non-cash benefits**	No benefits
1-8 years	7	23	31	26	59
9-11 years	11	4	10	5	4
+11 years	10	73	59	69	37
Total	*28*	*100*	*100*	*100*	*100*

Note: Averages are only over non-zero values.
*Includes food, fuel, transportation, support for ceremonies, and non-game natural resources)
**Households receiving at least one type of cash benefit plus at least one type of non-cash benefits at the same time.

Distribution of conservancy benefits, by age of conservancy (percent)



As in previous tables that display average value of conservancy benefits, those households that receive both types of benefits account for the highest average values. Although not statistically significant, Table 18 shows that cash-and-non-cash benefits received by households from the youngest conservancies (498 NAD), also the cohort with the smallest number of conservancies, surpass the average of all benefits found for the sample (211 NAD). However households from the youngest conservancies that either receive only cash or only non-cash benefits, obtain the lowest values of benefits for the respective category on average across the sample.

Table 18: Conservancy benefits, by age of conservancy (mean NAD)

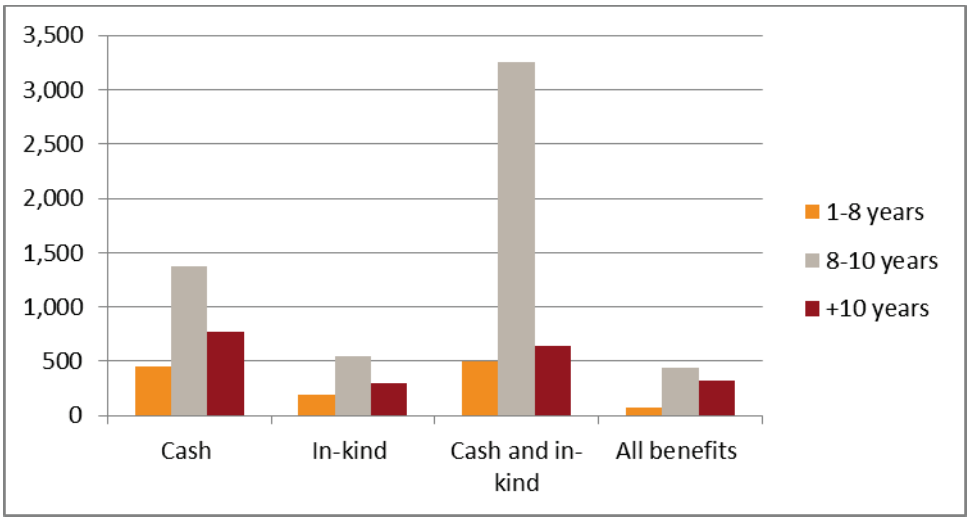
Age of conservancy	Number of conservancies	Cash benefits	Non-cash benefits*	Cash and non-cash benefits**	All benefits
1-8 years	7	455	187	498	73
8-10 years	11	1,376	545	3,250	445
+10 years	10	774	294	636	319
Total	*28*	*739*	*286*	*662*	*211*

Notes: Mean values per conservancy for each category. Averages are only over non-zero values.

*Includes food, fuel, transportation, support for ceremonies, and non-game natural resources).

**Households receiving one type of cash benefits plus at least one kind of non-cash benefits at the same time. Outlier observations that were twice the value of the mean or larger were not considered.

Conservancy benefits, by age of conservancy (mean NAD)



The average value of benefits displayed in Table 19 did not register a statistically significant difference according to the gender of the household head. Although, female-headed households obtained on average higher values of the non-cash benefits they received, in contrast to male-headed households that reported higher values from cash benefits. Among those households that reported being recipients of both types of benefits, the average that male-headed households received is slightly less than twice as large as the average that female-headed households receive in that cohort of the sample.

Table 19: Conservancy benefits, by head of household gender (mean NAD)

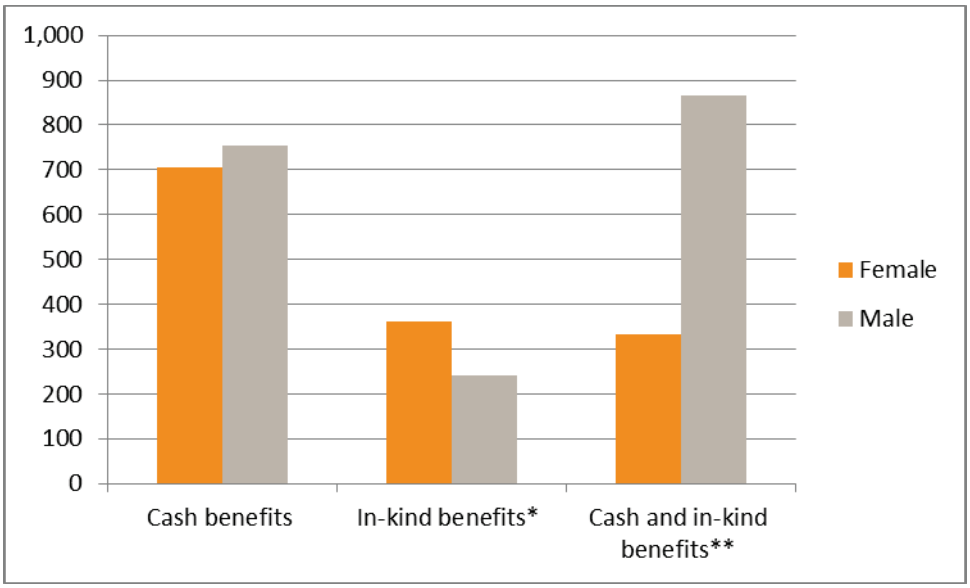
Type of benefits	Female	Male	Both types
Cash benefits	706	754	739
Non-cash benefits*	362	241	286
Cash and non-cash benefits**	332	866	662

Note: Averages are only over non-zero values.

*Includes non-cash benefits (food, fuel, transportation, support for ceremonies, and non-game natural resources).

**Households receiving at least one type of cash benefits plus at least one type of non-cash benefits at the same time. Outlier observations twice as large as the mean and larger were not considered.

Conservancy benefits, by head of household gender (mean NAD)



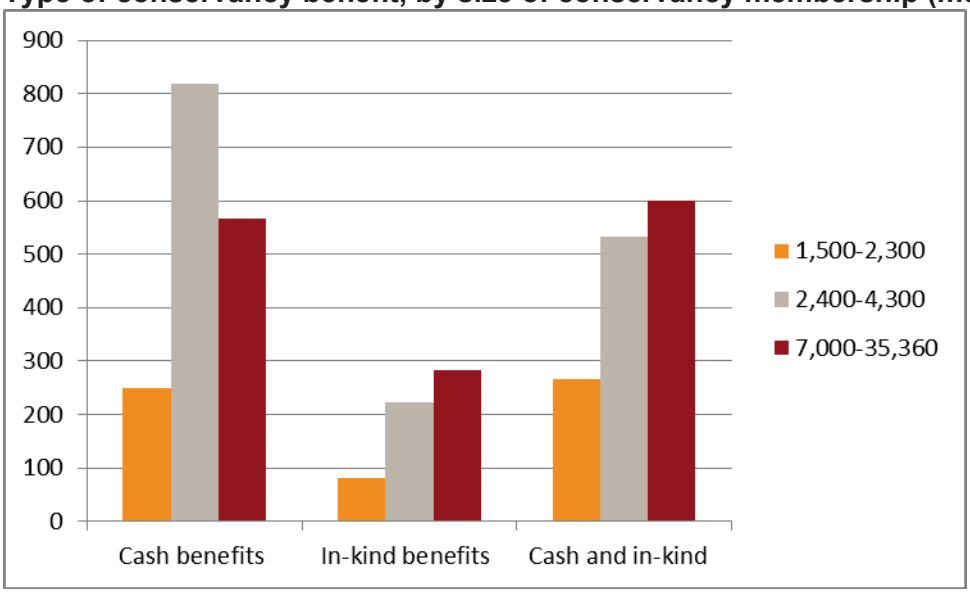
The average value of benefits varies across conservancies according to their size. Table 20 reveals a strong tendency for households in smaller conservancies to receive larger values of the three kinds of conservancy benefits ($p<0.05$); although this tendency is not statistically significant for the case of non-cash benefits. Ignoring the smallest membership-size category, from the size category of 1,500-2,300 inhabitants on, there appears to be an increase in average benefits across the types of benefits, though it is not statistically significant.

Table 20: Type of conservancy benefit, by size of conservancy membership (mean NAD)

Conservancy membership range	Cash benefits (mean)	Non-cash benefits (mean)*	Cash and in-kind (mean)**
250-1,300 inhabitants	4,219	1,334	5,301***
1,500-2,300 inhabitants	249	81	267
2,400-4,300 inhabitants	819	224	533
7,000-35,360 inhabitants	566	283	600
Total	739	286	662

Note: Averages are only over non-zero values.
*Non-cash benefits include: food, fuel, transportation, support for ceremonies, and non-game natural resources
**Households receiving at least one type of cash benefits plus at least one type of non-cash benefits at the same time. ***Outlier observation not considered (twice as large as the mean value of cash and non-cash benefits for the indicated segment of households).

Type of conservancy benefit, by size of conservancy membership (mean NAD)



Several observations may be made on Table 21. The distribution of non-cash benefits registered two peaks of their average value, “Afrikaans” at 1,539 NAD and “Other” linguistic groups” at 5,906 NAD, received on average that contrast with the remaining average value of this kind of benefits across other linguistic groups, whose maximum is 833 NAD ($p<0.05$). The distribution of cash and cash plus non-cash benefits is not statistically significant across linguistic groups.

Table 21: Conservancy benefits, by language and type of benefits (mean NAD)

Language	Cash benefits	Non-cash benefits*	Cash and non-cash benefits**
Silozi	100	15	112
Afrikaans	5946	1539	8,772
Rukavango	572	85	519
Otjiherero	1718	647	3,391
Khoisan	502	412	1103
Oshiwambo	588	246	600
Damara/Nama	2456	833	1,265
English	200	-	-
Other	463	5,906	1,600
Total	739	286	662

Note: 4 outlier observations not considered. Averages are only over non-zero values.

*Non-cash benefits include: food, fuel, transportation, support for ceremonies, and non-game natural resources.

**Households receiving at least one type of cash benefits plus at least one type of non-cash benefits at the same time. Outlier observations twice as large as the mean and larger were not considered.

3.3. Conservancy household standard-of-living measures[12]

This section presents the results of the exploratory baseline analysis of conservancy-household standard of living by conservancy, region, and demographics. In each case, income, expenditure, and asset figures are triangulated and, where possible, compared to other sources.

Living standards by conservancy

Table 22 indicates that even within a given indicator there is considerable variation in standard of living across the conservancies in our sample. Average household income varies from $2,322 through $28,966; average household expenditure varies from $3,877 through $25,844; average household assets vary from $73 through $23,988. Across indicators, the various measures appear to tell a similar story: household income is positively correlated with household expenditure (0.33; $p<0.01$) and with household assets (0.41; $p<0.01$), while household assets are positively correlated with household expenditure is (0.30; $p<0.01$).

[12] Overall, the figures contained in this subsection vary when compared to the results NORC reported in July 2012 because this analysis used survey weights to estimate the households' standard-of-living measures. Also, as we indicate in the forthcoming table footnotes, all outlier observations – two times larger than the mean for household income and expenditures means, and 500,000 NAD or larger for household assets means – were excluded in our estimations for this report.

Table 22: Household income, expenditure, and assets, by conservancy (2011 NAD)

Conservancy	Size of membership*	Mean income	Mean expenditures	Mean assets
Anabeb	4,300	4,850	8,276	3,641
Balyerwa	25,000	6,161	8,469	2,160
Doro !Nawas	2,400	12,404	8,660	21,193
Ehirovipuka	1,500	9,288	10,184	5,681
George Mukoya	250	9,464	8,979	3,221
Khoadi Hoas	7,000	13,908	8,081	15,183
King Nehale	260	13,624	13,449	14,977
Kwando	2,000	6,067	7,968	1,690
Marienfluss	300	4,429	6,429	73
Mashi	1,200	28,966	7,640	3,910
Mayuni	1,300	6,000	9,322	2,891
Muduva Nyangana	7,700	17,339	9,232	5,422
N#a-Jaqna	35,360	3,901	3,877	398
Nyae Nyae	2,500	7,342	5,428	3,220
Omatendeka	1,500	11,108	12,153	8,077
Orupembe	3,200	5,599	5,218	103
Puros	20,000	3,888	8,155	307
Salambala	2,100	12,470	9,576	2,616
Sanitatas	2,000	10,456	4,587	4,162
Sesfontein	2,500	6,698	7,990	1,908
Sheya Shuushona	400	15,299	4,622	2,190
Sikunga	25,000	6,111	12,163	2,050
Sorris Sorris	2,300	12,860	10,221	7,128
Torra	2,000	21,629	10,830	17,927
Uibasen (Twyfelfontein-Uibasen)	2,000	25,369	13,001	9,684
Uukolonkadi-Ruacana	3,900	21,316	8,101	16,894
Uukwaluudhi	2,500	19,274	7,355	23,988
Wuparo	230	2,322	8,007	1,927

Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.

*From *Namibia's Communal Conservancies: A Review of Progress, 2010*, Windhoek: NASCO, Table 1, pp. 6-7.

An obvious question is which indicator best reflects the most relevant variation in household standard of living. That should be the indicator to use in an impact evaluation. At the same time, the MCC's focus is on income, though consumption and expenditures can also be used as proxies. The Namibian HIES uses household expenditure as their preferred measure of income due to the difficulties in accurately collecting the constituent components of income directly. In the discussion of standard of living by region, below, we consider how reliable expenditure might be for a measure of household income.

Living standards by region

Using the same data as those in Table 22, region-level household indicators of standard of living are presented in Table 23. This table also includes an upper 95-percent confidence limit for the survey's estimate of household expenditure as well as the NHIES estimates as adjusted according to the methodology presented in Chapter 1. Let us consider some likely implications of this table.

Table 23: Conservancy household income, expenditure, and assets, by region (NAD)

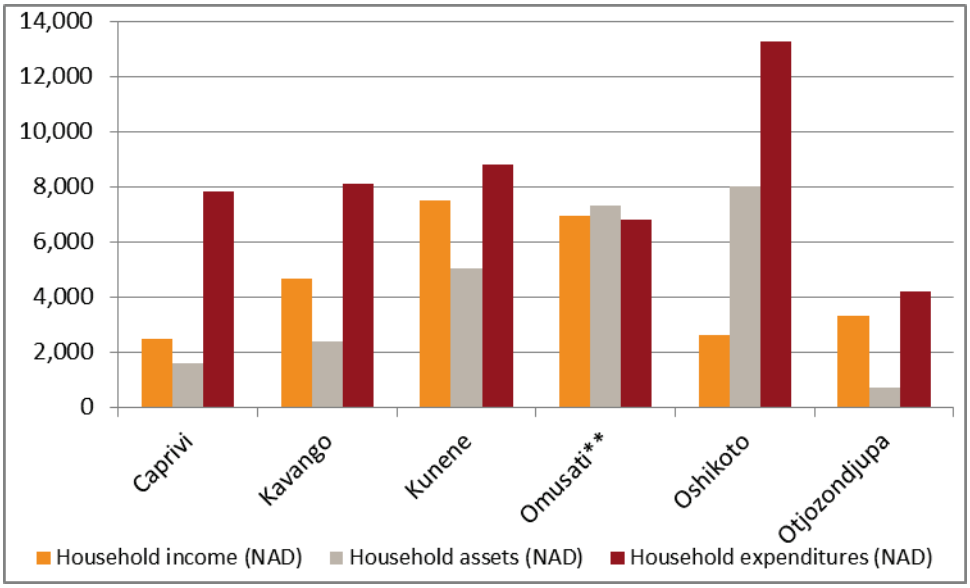
Region	Household income (NAD)		Household assets (NAD)***		Household expenditures (NAD)			NHIES income (adj.)*
	Mean	SD	Mean	SD	Mean	SD	Upper 95%	Mean
Caprivi	2,502	5,431	1,623	1,889	7,864	5,328	6,736	16,729
Kavango	4,680	4,943	2,387	2,166	8,115	5,421	10,091	15,721
Kunene	7,539	7,390	5,073	13,018	8,842	6,006	9,726	18,400
Omusati**	6,985	6,492	7,343	16,057	6,813	5,544	8,055	17,384
Oshikoto	2,618	8,325	8,044	13,535	13,275	6,406	15,535	17,680
Otjozondjupa	3,337	4,782	722	3,059	4,203	4,526	5,358	23,032

*These NHIES (2006) household "income" figures for 2003/4 are from Table 6.7. The NHIES accompanying text indicates that in fact the figures are based on household expenditures. The NHIES figures have been adjusted for the above-table in three ways: for rural households, for long-form vs. short-form data collection instruments, and for inflation (CPI reference: http://www.gocurrency.com/countries/namibia). See Footnote 3 for details.

**Outlier observations greater than two standard deviations above the mean and were not considered.

***Observations larger than $500,000 were not considered.

Conservancy household income, expenditure, and assets, by region (NAD)



First we note that the adjusted NHIES figures are not much different from the expenditure estimates from the CS-INP instrument. Given how they come from a completely different instrument and definition, this is no small achievement. Second, we note that with the exception of Otjozondjupa, the NHIES figures are generally within the upper bound of the 95-percent confidence band for the estimates. Lastly, we see that with some limited exceptions (e.g., Caprivi), standard deviations of the mean estimates are generally of the same size as the mean. This is encouraging since it means that our indicators are probably stable and therefore adequate for impact evaluation. This also suggests that the minimum detectable effect size (roughly, the change desired for the indicator as a result of the intervention divided by the standard deviation) can be achieved with a reasonable sample size such as is available for the CS case.

Finally, "NHIES 1993/1994 reported 38% female-headed households accounting for 25% of total consumption." NHIES 2003/2004 reported 40 per cent female-headed households accounting for 29% of total consumption. From our sample we find 44% female-headed households accounting for 31% of total consumption. NORC's figures, therefore, appear nicely to fit the trend.

Table 24 displays the distribution of household income by region and economic activity of its members. The largest share of CS households' income in almost all regions is generated by wages; only in Kunene does non-labor income represent a larger proportion of average household income than wages. Non-labor income[13] constitutes the second-largest source of household income in all regions, except for Caprivi and Kavango, where agricultural activities—especially livestock—do; even though this source of

[13] NORC's CS/INP surveys included the following items in non-labour income: remittances, rental of land or property, rental of agricultural equipment or tools, sale of assets, state pension or old age pension, war veterans grants, disability grants, child welfare grants, other social assistance payments, donations from aid projects/programs, and income from business ownership.

income is statistically significant for Kunene ($p<0.01$), Omusati ($p<0.01$), Oshikoto ($p<0.01$), and Otjozondjupa ($p<0.1$).

Although not statistically significant for any region, agricultural activities are the third-largest source of income for Kunene and Otjozondjupa households. In contrast, due to large activity costs, agricultural income registered negative average figures in Omusati and Oshikoto households. Across regions, the proportion of income that comes from INP harvesting at households that receive conservancies support is very modest, less than 0.2% across five regions and 2% in Otjozondjupa.

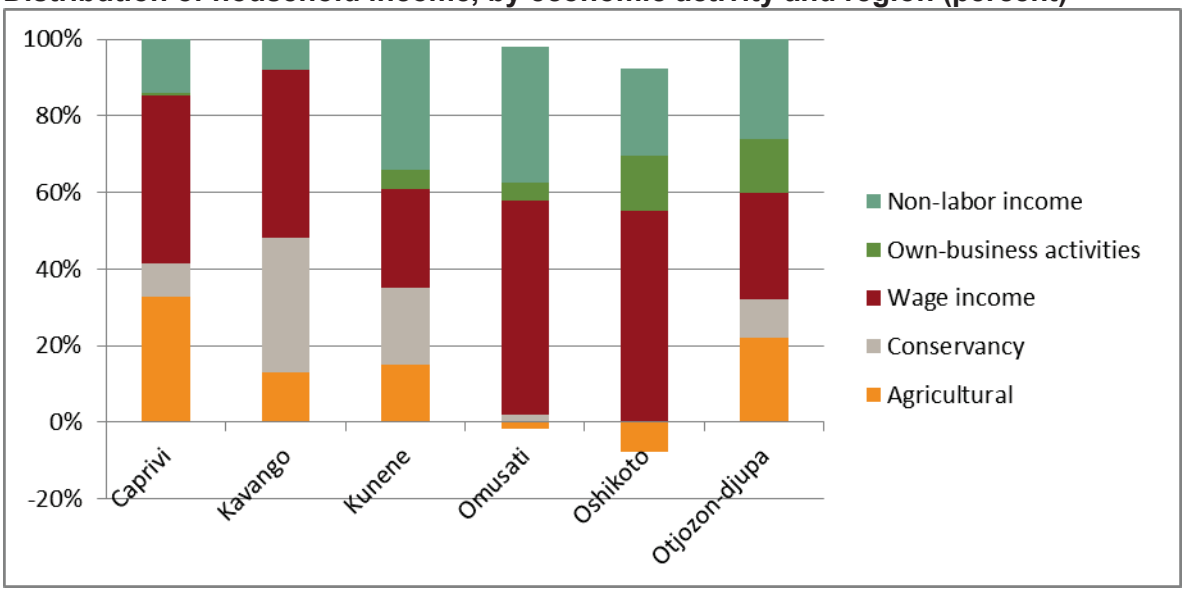
Table 24: Distribution of household income, by economic activity and region (percent)

Economic activity	Caprivi	Kavango	Kunene	Omusati	Oshikoto	Otjozon-djupa
Agricultural	33	13	15	-2	-9	22
INP*	0[a]	0[a]	0[a]	0[a]	0[a]	2
Other crops	7	2	0	1	1	1
Livestock	26	11	15	-3	-10	19
Conservancy	9	35	20	2	0	10
Wage income	44	44	26	58	65	28
Own-business activities	1	0	5	5	17	14
Non-labor income	14	8	34	37	27	26
Total	*100*	*100*	*100*	*100*	*100*	*100*

Note: Negative values imply that over the reference period the household's costs for the activity exceeded its revenues (cash or in kind).

*The sampling design did not take INP activity into account so, given its prevalence, little was captured in the conservancy households sampled. (a) Less than 0.2 percent.

Distribution of household income, by economic activity and region (percent)



Demographics of conservancy living standards

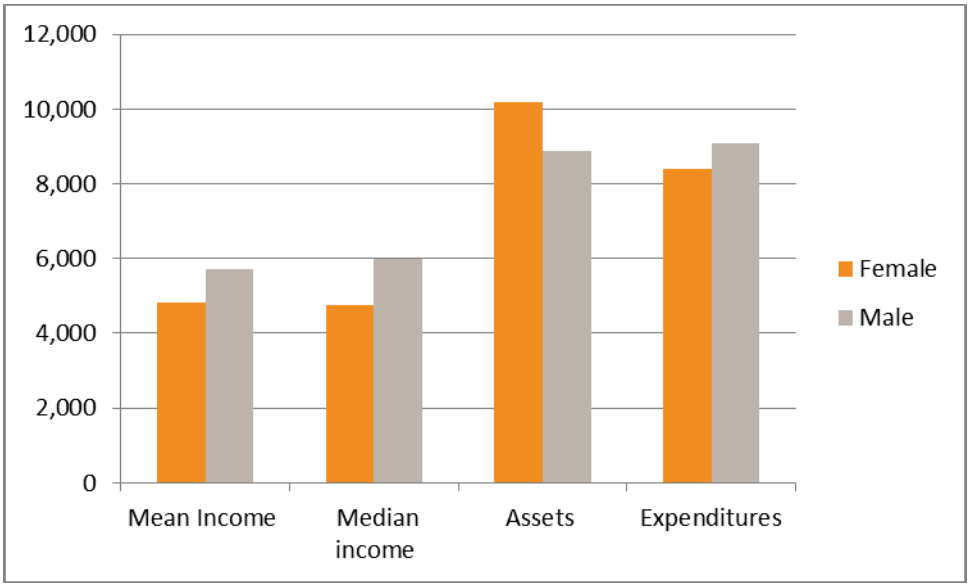
Conservancy living standards can be further examined by looking at differences among different demographic groups. Looking at male- versus female-headed households in Table 25, although not statistically significant, we find interesting differences: while male-headed household incomes are nearly twice as much as those for female-headed households, the female-headed households had assets with an average value about 25% higher than that of male-headed households. Male-headed households have higher expenditures to match their higher incomes. We also observe the household median income being less than average household income. This indicates a measure of skewness in the income distribution, that is, a sign of income inequality. Since the figure is about 50 percent for female-headed households and less than 40 percent for male-headed households, we see that, unsurprisingly, the group of male-headed households displays greater income inequality than the group of female-headed households.

Table 25: Household income, expenditure, and assets by head of household's gender (mean NAD)

Gender of head	Mean Income*	Median income	Assets**	Expenditures*
Female	4,832	4,745	10,169	8,401
Male	5,714	6,000	8,886	9,073

Notes: All figures in NAD. (*) Outlier observations larger than two times the variable mean were not considered. (**) Observations larger than NAD 500,000 were not considered.

Household income, expenditure, and assets by head of household's gender (NAD)



There is a general upwards trend in household income, assets, and expenditures along with the age of the household head (Table 26). On average, household income increases from 1,660 NAD among the households with the youngest heads to 7,162 NAD among the households whose heads are over 65 years old ($p<0.01$). In addition, household expenditures increase with age from 7,743 NAD to NAD 9,376

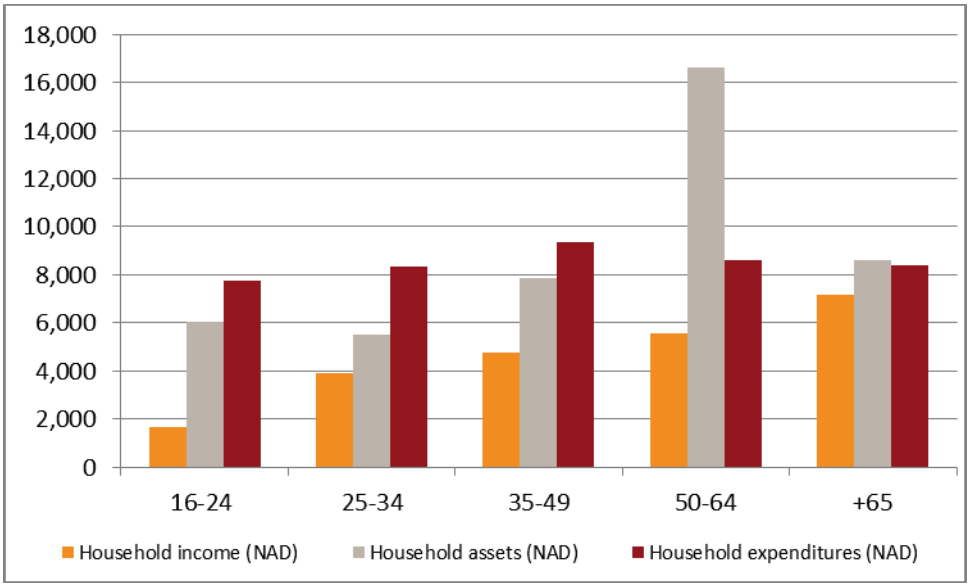
in households whose heads are between 35 and 49 years old, but then they decrease to NAD 8,403 among households whose heads are beyond 65 ($p<0.05$).

Table 26: Household income, expenditure, and assets, by head-of-household age

Head-of-household's age	Household income (NAD)*		Household assets (NAD)**		Household expenditures (NAD)*	
	Mean	SD	Mean	SD	Mean	SD
16-24	1,660	5,241	6,051	12,616	7,743	8,239
25-34	3,936	9,411	5,538	29,462	8,348	6,651
35-49	4,794	6,313	7,885	15,387	9,376	6,091
50-64	5,547	6,417	16,639	46,957	8,629	6,156
+65	7,162	7,443	8,622	19,232	8,403	5,767

*Outlier observations larger than two times the variable mean were not considered.
** Observations larger than NAD 500,000 were not considered.

Household income, expenditure, and assets, by head-of-household age



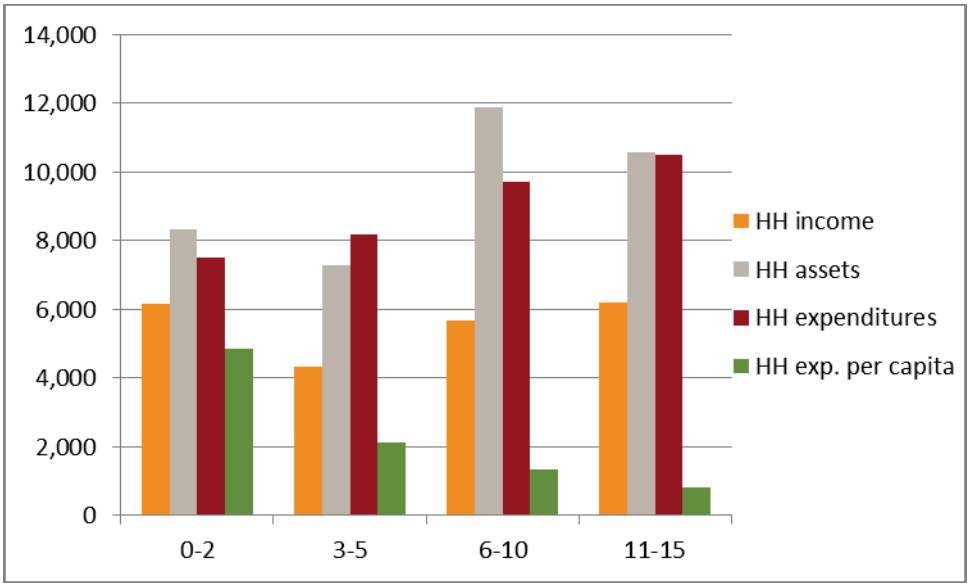
When it comes to household size, although statistically not significant, , the smallest households registered quite high incomes, almost the same average values as the largest households, and household assets follow a mixed pattern (Table 27). In contrast, expenditures follow an increasing pattern as the number of household members increase ($p<0.01$); expenditures per capita shrink as household increase their size. While requiring multivariate analysis to account for other key influences, it would appear that up to a point conservancy size permits economies of scale that lead to higher standards of living. For example, the correlation between conservancy size and average household expenditure is 0.17.

Table 27: Household income, expenditures, and assets, by household size (NAD)

Household size	Household income mean*	Household assets mean**	Household expenditures	
			Mean*	Mean per capita*
0-2	6,176	8,317	7,499	4,848
3-5	4,312	7,283	8,176	2,122
6-10	5,677	11,892	9,716	1,354
11-15	6,195	10,576	10,478	832

*Outlier observations larger than two times the variable mean were not considered.
** Observations larger than NAD 500,000 were not considered.

Household income, expenditures, and assets, by household size (NAD)



3.4. Household agricultural activity in conservancies

INP activities by conservancy

It was expected that some conservancy members would also be members of a PPO; however, only 36 conservancy households reported being members of a PPO, and all 36 were a member of the same PPO - the Okahulo Association (EWC). The results of any calculations regarding these households would not have been representative and so have been omitted.

Other crop activities by conservancies

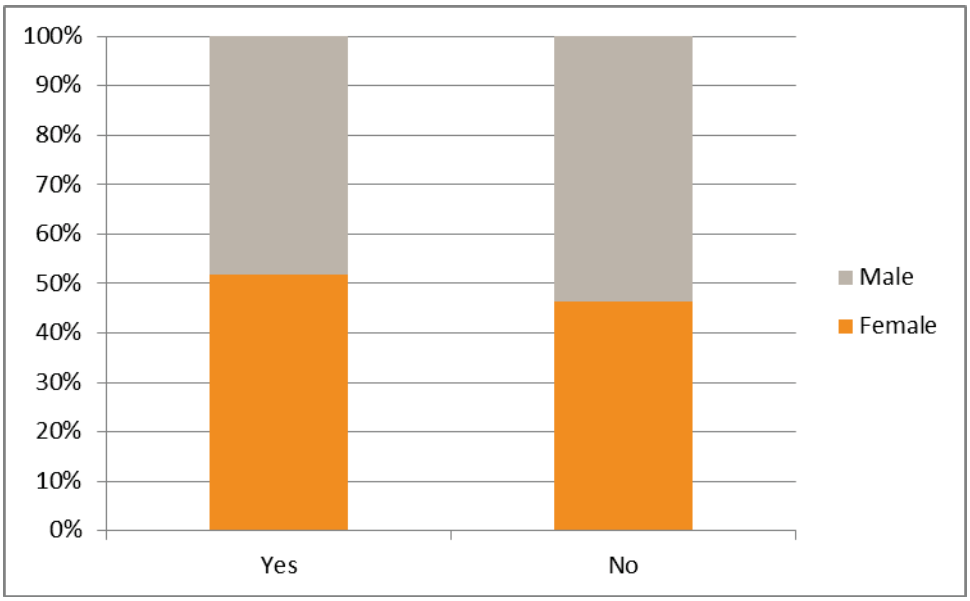
Many conservancy households were involved in growing and harvesting non-INP crops as well as raising livestock. The following tables further explore these activities.

Although the difference between household heads' gender resulted statistically non-significant, Table 28 shows that male-and female-headed households tend to grow and/or harvest non-INP crops at similar rates. This display relates to Table 6, in which households that registered non-INP crops were composed by 43.4% female-headed and 56.6% male-headed households.

Table 28: Engagement in other crops, by head of household gender (percent)

Head of household gender	Percent of gender		
	Yes	No	Total
Female	68	32	100
Male	63	37	100

Engagement in other crops, by head of household gender (percent)

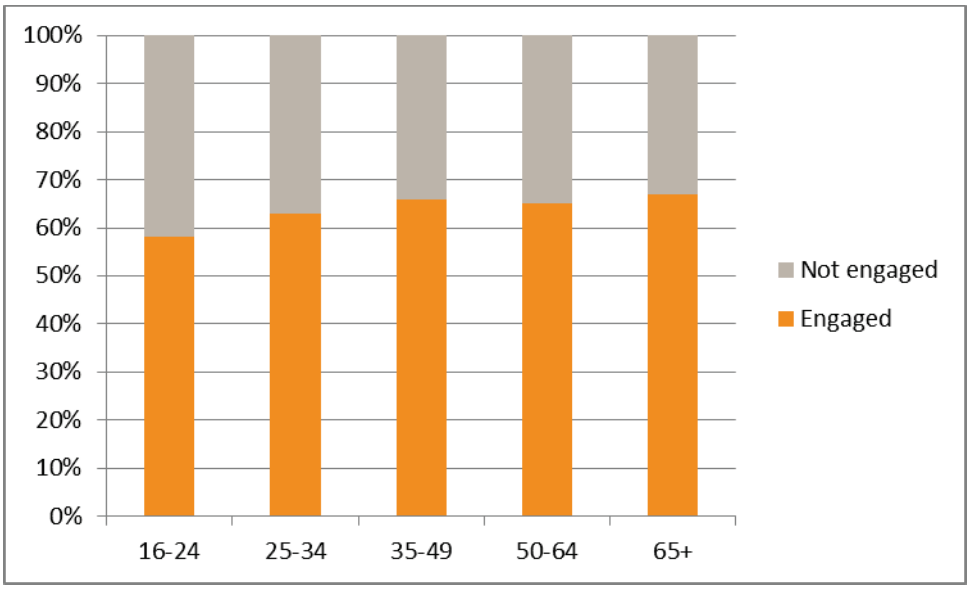


Similarly, there are few differences in the engagement in other crops by age group (Table 29) – the youngest group has a slightly lower rate of engagement than the other groups, which range from 63 to 67%. However, these differences are not statistically significant.

Table 29: Engagement in other crops, by age of head household (percent)

Head of household age	Percent of age group engaged in other crop activities		
	Engaged	Not engaged	Total
16-24	58	42	100
25-34	63	37	100
35-49	66	34	100
50-64	65	35	100
+65	67	33	100

Engagement in other crops, by age of head household (percent)

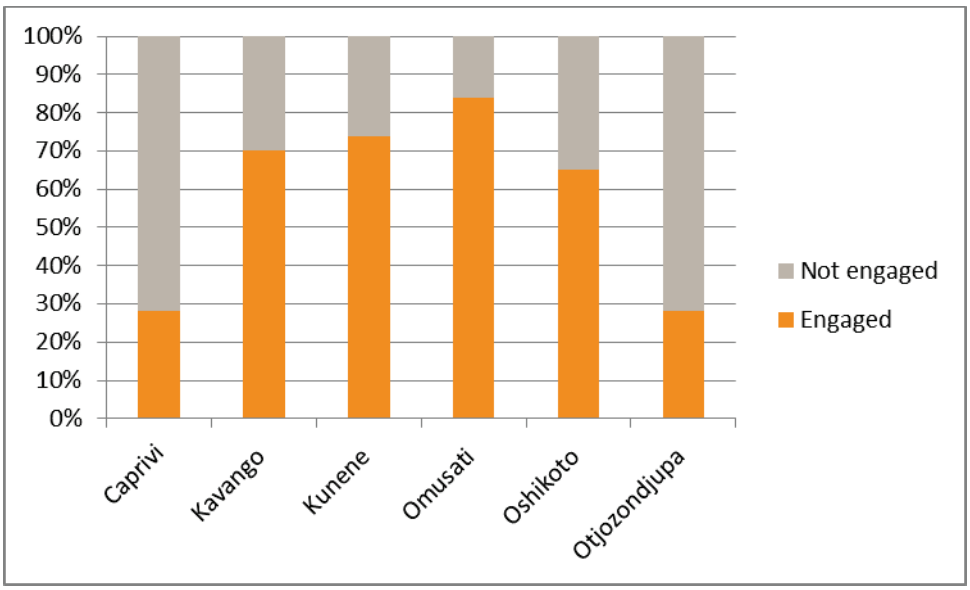


On the other hand, there are very distinct differences in rates of engagement in non-INP crops among the different regions surveyed, as seen in Table 30; these differences between households that engaged in the harvest of non-INP crops and those that did not are statistically significant across all sampled regions. Caprivi ($p<0.01$) and Otjozondjupa ($p<0.05$) have the lowest rates of engagement, at 28% each. All other regions have rates in the 65-74% range ($p<0.01$), with the exception of Omusati (84%).

Table 30: Engagement in other crops, by region (percent)

Region	Percent of households in region engaged in other crop activities		
	Engaged	Not engaged	Total
Caprivi	28	72	100
Kavango	70	30	100
Kunene	74	26	100
Omusati	84	16	100
Oshikoto	65	35	100
Otjozondjupa	28	72	100

Engagement in other crops, by region (percent)



The engagement of CS households in non-INP crops is displayed in Table 31. Almost all conservancies reported a combination of households that are engaged and non-engaged to harvest non-INP crops ($p<0.01$). Only 5 out of 28 did not register households that harvest non-INP crops, and all households of the sample in one conservancy, George Mukoya, declared being engaged in the harvest of those crops.

Table 31: Engagement in other crop activities, by conservancy (percent)

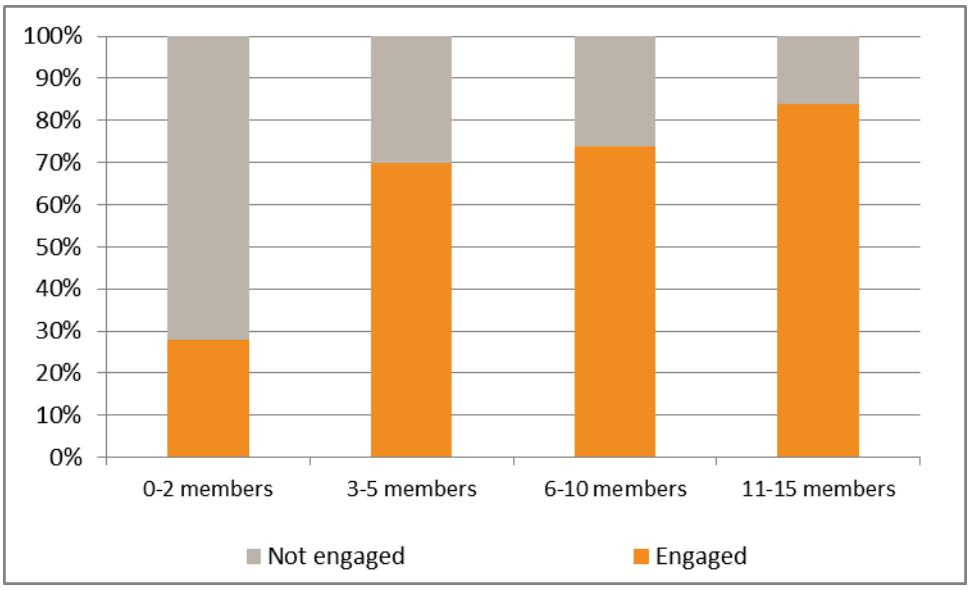
Conservancy	Percent of households in conservancy		
	Engaged	Not engaged	Total
Orupembe	10	90	100
Sanitatas	0	100	100
Ehirovipuka	91	9	100
Omatendeka	38	62	100
Sesfontein	25	75	100
Torra	15	85	100
Puros	0	100	100
Anabeb	13	87	100
Marienfluss	22	78	100
Uukolonkadi-Ruacana	96	4	100
Doro !Nawas	14	86	100
Uibasen (Twyfelfontein-Uibasen)	0	100	100
Khoadi Hoas	8	92	100
Sorris Sorris	0	100	100
Uukwaluudhi	100	0	100
Sheya Shuushona	83	17	100
King Nehale	97	3	100
Muduva Nyangana	88	12	100
George Mukoya	100	0	100
Nyae Nyae	33	67	100
N#a-Jaqna	29	71	100
Kwando	83	17	100
Mayuni	77	23	100
Mashi	92	8	100
Wuparo	50	50	100
Balyerwa	67	33	100
Sikunga	0	100	100
Salambala	42	58	100

Regarding household size and engagement in non-INP crops, participation of households in these activities increases with size. Likewise in this sample, smaller households showed lower rates of engagement in non-INP crops (Table 32), presumably because the smaller households need less income to support their families ($p<0.01$).

Table 32: Engagement in other crop activities, by family size (percent)

Family size	Percent of household of given family size		
	Engaged	Not engaged	Total
0-2 members	28	72	100
3-5 members	70	30	100
6-10 members	74	26	100
11-15 members	84	16	100

Engagement in other crop activities, by family size (percent)



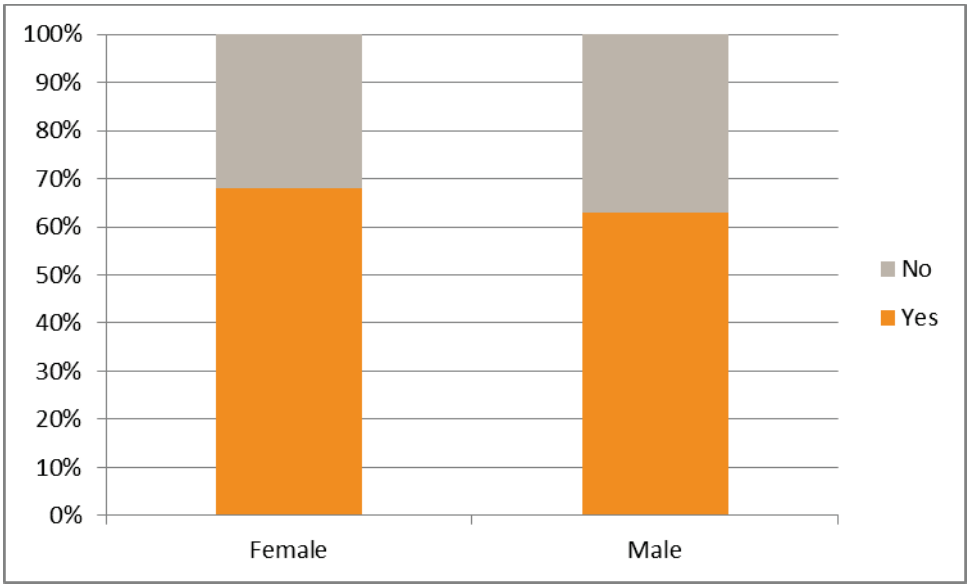
Livestock activities by conservancies

Now, we move to conservancy households' livestock activities. Table 33 indicates that as in the non-INP crop engagement, there is only a small difference in rates of involvement in livestock activities between male- and female-headed households ($p<0.01$).

Table 33: Livestock activities in conservancies, by head-of-household gender (percent)

Head of household gender	Percent of gender engaging in activity		
	Yes	No	Total
Female	68	32	100
Male	63	37	100

Livestock activities in conservancies, by head-of-household gender (percent)



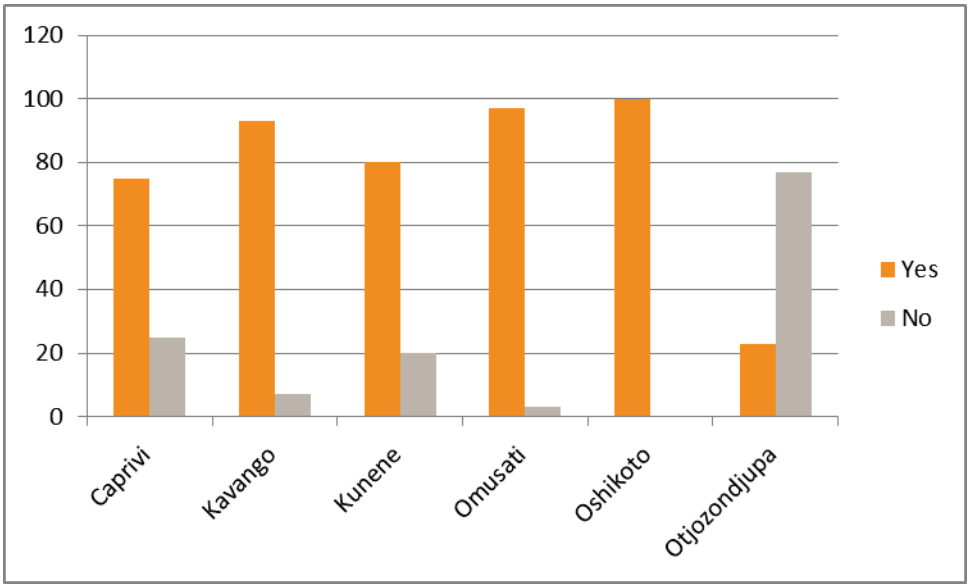
Regional differences among households did appear, as shown in Table 34. Oshikoto, Omusati, and Kavango all have a very large proportion of households engaging in livestock activity—over 90% each. In Caprivi and Kavango, the proportions are still more than 70%. In stark contrast there is Otjozondjupa, in which only 23% of households participate in livestock activities ($p<0.01$). Among the regions with high rates of livestock activities, there is much variation in the mean number of animals raised per household, ranging from 13 animals in Caprivi to 89 in Kunene.

Table 34: Livestock activities in conservancies, by region (percent)

Region	Percent of households engaging in activity			Mean number of animals by herding household*
	Yes	No	Total	
Caprivi	75	25	100	13
Kavango	93	7	100	25
Kunene	80	20	100	89
Omusati	97	3	100	53
Oshikoto	100	0	100	66
Otjozondjupa	23	77	100	3

*Average refers only to those households that were engaged in animal husbandry.

Livestock activities in conservancies, by region (percent)



Similarly to the distribution by region, Table 35 indicates that the vast majority of households in almost all conservancies performed livestock activities, and that in only 3 out of 28 conservancies less than 35% had livestock ($p<0.01$). Data in Table 31 and Table 35 above suggest that there is no correlation between breeding livestock and engagement in other crop activities.

In addition, there is a small correlation, 0.21 between the engagement in livestock activities and the number of animals in the household across conservancies. This could be explained by the different types and sizes of animals that are bred, the size of the household, as well as weather and terrain conditions.

3.5 Household-declared training in conservancies

This section analyzes the attendance to trainings that conservancy households reported over the last year before the data was collected. Only 27 out of 1,032 non-weighted CS households reported the frequency with which they attended any trainings or meetings organised by the (conservancy/community forest/association/harvester group)[14]. This small number of households was filtered by the initial question of Section C of the survey instrument, which asked respondents whether their households harvested INP. By gender of the head of household, 7 of them are female-headed and 20 male-headed. Among the female-headed households, almost 65% of them attended all of these meetings/trainings, along with 77% of the male-headed households. These 27 households are distributed across all regions where conservancy households were surveyed, most of them in Caprivi, 30%, and Omusati, 27%.

[14] Question C2.4 of the survey instrument "How often did members of your household attend trainings or meetings organized by the (conservancy/community forest/association/harvester group) in the past 12 months?" The nature of the training and/or meeting was left open.

Table 35: Livestock activities in conservancies, by conservancy (percent)

Conservancy	Percent of households engaging in activity			Mean number of animals by herding household*
	Yes	No	Total	
Orupembe	94	6	100	264
Sanitatas	81	19	100	188
Ehirovipuka	94	6	100	63
Omatendeka	71	29	100	35
Sesfontein	86	14	100	125
Torra	70	30	100	95
Puros	94	6	100	108
Anabeb	59	41	100	38
Marienfluss	91	9	100	222
Uukolonkadi-Ruacana	98	2	100	50
Doro !Nawas	87	13	100	94
Uibasen (Twyfelfontein-Uibasen)	35	65	100	6
Khoadi Hoas	84	16	100	89
Sorris Sorris	75	25	100	35
Uukwaluudhi	100	0	100	51
Sheya Shuushona	92	8	100	77
King Nehale	100	0	100	66
Muduva Nyangana	92	8	100	23
George Mukoya	100	0	100	33
Nyae Nyae	23	77	100	3
N#a-Jaqna	23	77	100	2
Kwando	84	16	100	10
Mayuni	70	30	100	13
Mashi	92	8	100	19
Wuparo	60	40	100	9
Balyerwa	83	17	100	11
Sikunga	67	33	100	9
Salambala	95	5	100	23

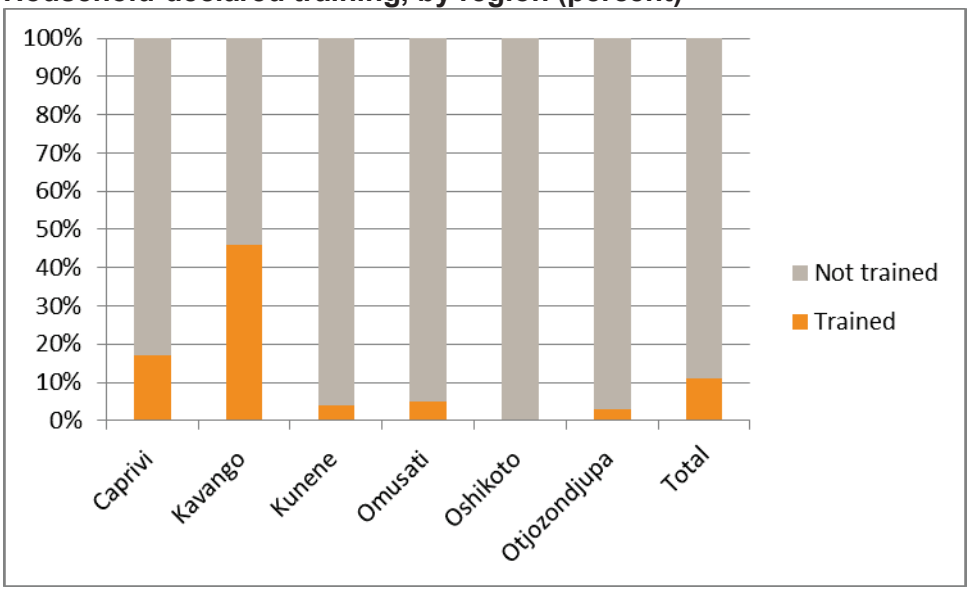
*Average refers only to those households that were engaged in animal husbandry.

In addition, the surveyed households were asked about their attendance to trainings brought by conservancies, community forests, associations, or other organised groups[15]. Table 36 through Table 42 indicate the distribution of these households by certain demographic and wealth characteristics.

Table 36: Household-declared training, by region (percent)

Region	Percent households in region receiving training		
	Trained	Not trained	Total
Caprivi	17	83	100
Kavango	46	54	100
Kunene	4	96	100
Omusati	5	95	100
Oshikoto	0	100	100
Otjozondjupa	3	97	100
Total	*11*	*89*	*100*

Household-declared training, by region (percent)



First, Table 36 displays the rates in which households have received any training brought by conservancies. In Kavango, conservancy households registered the highest proportion of participation, 46% of households in that region; however, the distribution in this region is not statistically significant. On a second position, 17% of Caprivi households reported trainings, and the remaining regions registered participation rates lower than 5 percent ($p<0.01$).

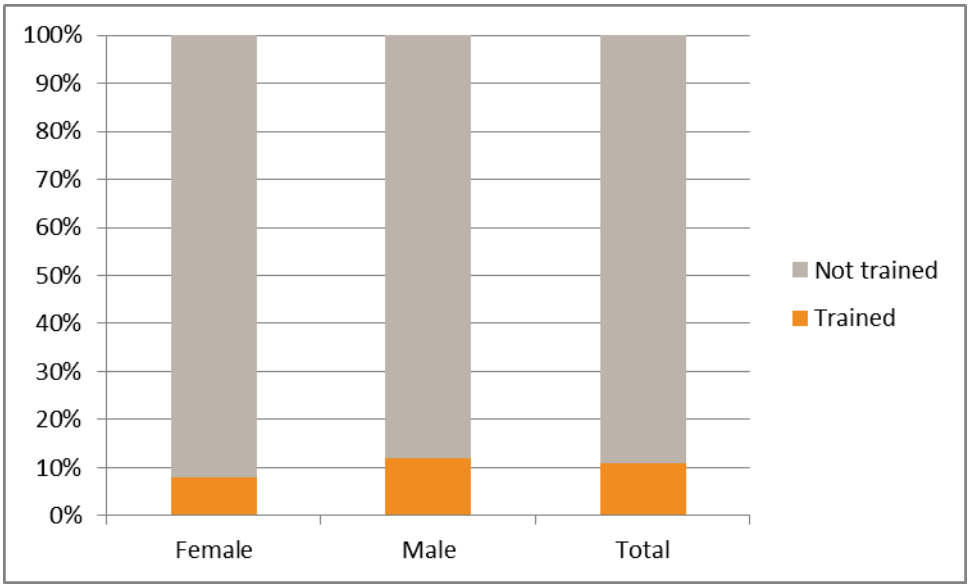
[15] Section K of the survey instrument.

The rate of households that reported participation in any training brought by conservancies is slightly higher for male-headed households than for female-headed ones, 12% vs. 8%, respectively (p<0.1).

Table 37: Household-declared training, by head of household gender (percent)

Gender of head of household	Percent households receiving training		
	Trained	Not trained	Total
Female	8	92	100
Male	12	88	100
Total	*11*	*89*	*100*

Household-declared training, by head of household gender (percent)



Analyzed by conservancy, Table 38 indicates that in 9 out of 28 conservancies no households have received any training through or related to conservancies, community forests, associations, or other organised groups in the last 12 months. From the remaining conservancies, 11 reported training participation rates smaller than 10% of households, and 6 of them registered participation rates in the range between 11 and 25% (p<0.05). In contrast, two conservancies, Muduva Nyangana and George Mukoya, reported that almost a half of their sample households participated in training during the last 12 months; even though both estimates are not statistically significant.

Table 38: Household-declared training, by conservancy (percent)

Conservancy	Percent households receiving training		
	Trained	Not trained	Total
Orupembe	0	100	100
Sanitatas	0	100	100
Ehirovipuka	12	88	100
Omatendeka	0	100	100
Sesfontein	3	97	100
Torra	9	91	100
Puros	0	100	100
Anabeb	2	98	100
Marienfluss	0	100	100
Uukolonkadi-Ruacana	4	96	100
Doro !Nawas	2	98	100
Uibasen (Twyfelfontein-Uibasen)	8	92	100
Khoadi Hoas	2	98	100
Sorris Sorris	0	100	100
Uukwaluudhi	22	78	100
Sheya Shuushona	0	100	100
King Nehale	0[(a)]	100	100
Muduva Nyangana	46	54	100
George Mukoya	50	50	100
Nyae Nyae	3	97	100
N#a-Jaqna	5	95	100
Kwando	23	77	100
Mayuni	12	88	100
Mashi	0	100	100
Wuparo	25	75	100
Balyerwa	17	83	100
Sikunga	0	100	100
Salambala	4	96	100
Average	*11*	*89*	*100*

[(a)] Value equal to 0.3%.

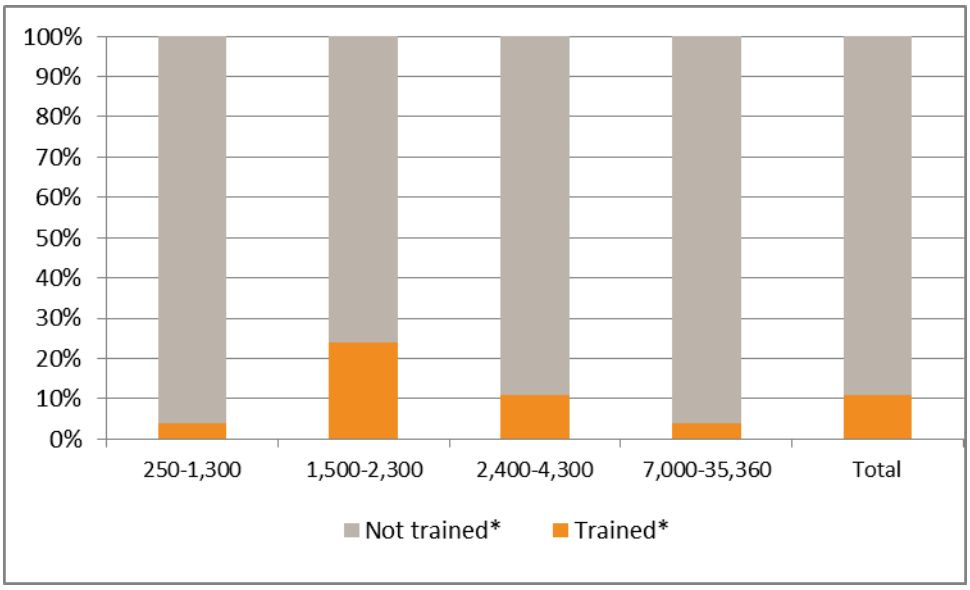
Table 39 indicates the rate of participation in trainings conservancy households reported by the size of the conservancy they belong to. Households that belong to the smallest, less than 1,300 members, and the largest conservancies, more than 7,000 members, reported lower rates of training, 4%, than those households that are located in conservancies with 1,500 to 4,300 members. The highest rate of participation was 24% for households in conservancies of 1,500 to 2,300 members. They are followed by households that belong to conservancies with 2,400 to 4,300 members, where 11% of them participated in trainings (p<0.01).

Table 39: Household-declared training, by size of conservancy membership (percent)

Conservancy size	Percent households within size group receiving training		
	Trained*	Not trained*	Total
250-1,300	4	96	100
1,500-2,300	24	76	100
2,400-4,300	11	89	100
7,000-35,360	4	96	100
Total	*11*	*89*	*100*

*p<0.01

Household-declared training, by size of conservancy membership (percent)



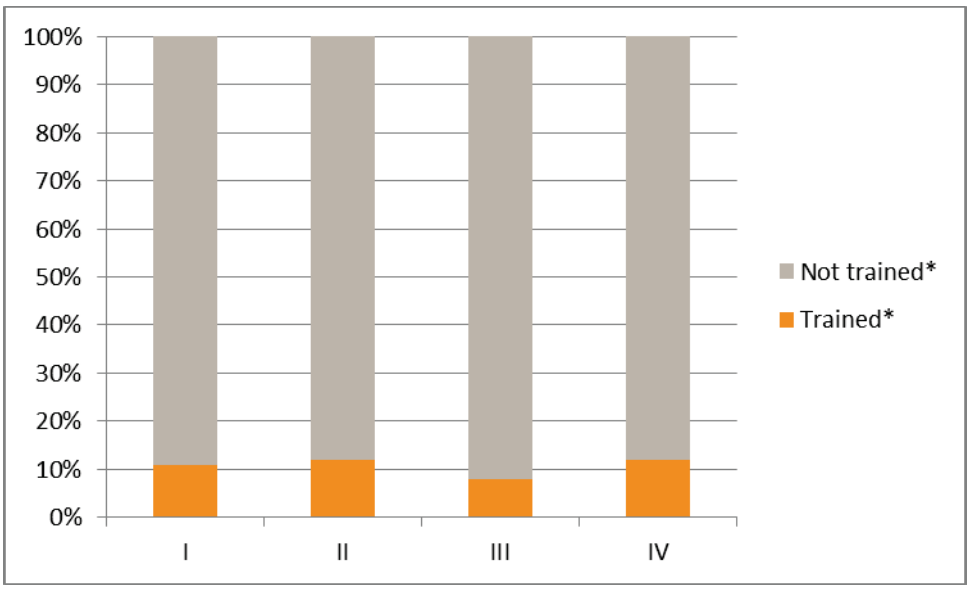
According to Table 40, the percentage of households that reported any training is quite even across expenditures quartiles. Only quartile III registers a slightly smaller proportion of households receiving training, 8% vs. an average percentage of 11% across the other quartiles (p<0.01).

Table 40: Household-declared training, by household expenditures quartile (percent)

Expenditures quartile	Percent households in quartile receiving training		
	Trained*	Not trained*	Total
I	11	89	100
II	12	88	100
III	8	92	100
IV	12	88	100
Total	*11*	*89*	*100*

*Estimations are statistically significant at 1% level

Household-declared training, by household expenditures quartile (percent)



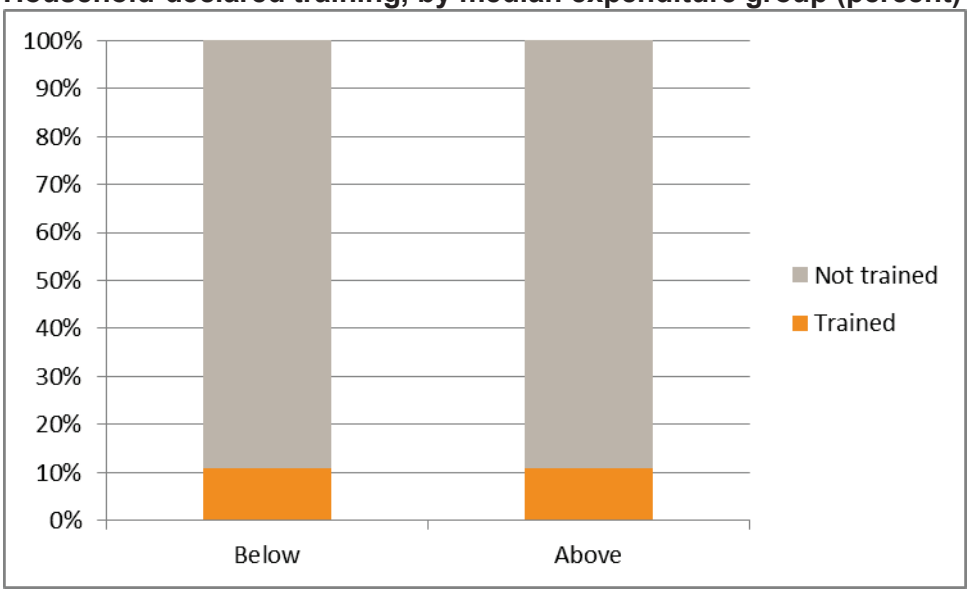
According to Table 41, the rate of trainings reported is not affected whether households are located above or below the household expenditures median ($p<0.01$).

Table 41: Household-declared training, by median expenditure group (percent)

Below or above the household expenditure median	Number of households*	Percent households receiving training		
		Trained	Not trained	Total
Below	20,959	11	89	100
Above	2,881	11	89	100
Total	*23,840*	*11*	*89*	*100*

*The weights used for each enumeration area in the sample modify the number of conservancy households below and above the median.

Household-declared training, by median expenditure group (percent)

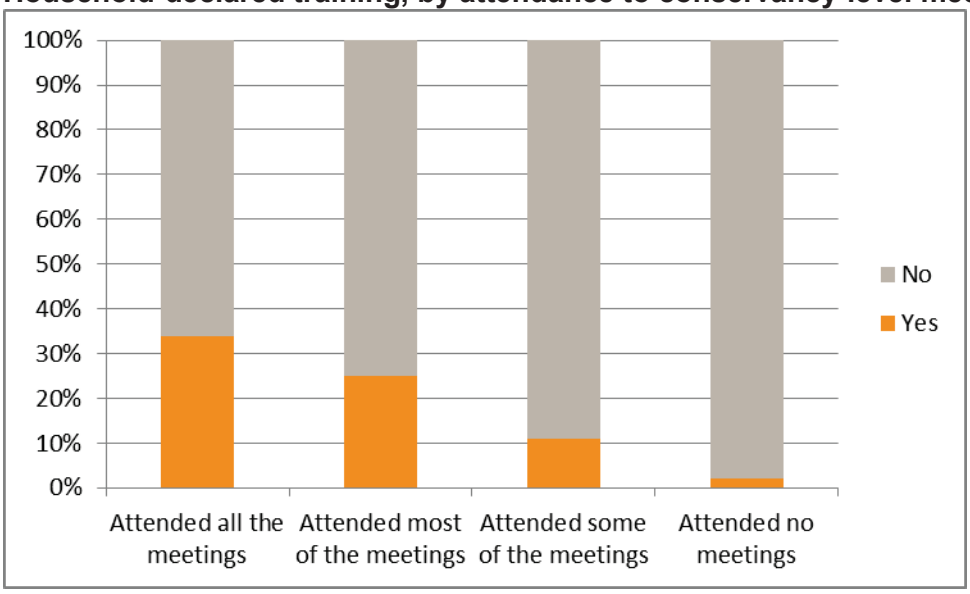


The data collection instrument asked respondents separately how frequently members of their households attended conservancy-level meetings, and additionally whether anyone in the household received any training offered by the conservancy. We would expect that the rate of training would be associated with the frequency of attendance to conservancy-level meetings. According to Table 42, the rate of participation in trainings increased along with the frequency of attendance to conservancy-level meetings; however, this trend resulted not statistically significant. It is possible, that some respondents considered events, meetings and trainings as the same activity, even though the instrument treated training and attendance to meetings as two different activities at the conservancy level.

Table 42: Household-declared training, by attendance to conservancy-level meetings (percent)

Frequency of attendance at conservancy-level meetings	Percent households receiving training		
	Yes	No	Total
Attended all the meetings	34	66	100
Attended most of the meetings	25	75	100
Attended some of the meetings	11	89	100
Attended no meetings	2	98	100
Total	*12*	*88*	*100*

Household-declared training, by attendance to conservancy-level meetings (percent)



4. An examination of INP household baseline data

This chapter examines the results of the 296 INP households surveyed. Results are presented on household composition, household activities involving INPs as well as other crops and livestock, standard of living, trainings received, and PPO involvement of households. While reading this section it is important to remember the data limitations and sampling issues outlined in Chapter 2 of this report. Our findings apply only to those households which were realized as part of our sample.

About 59% of households harvested Marula, 28% harvested Devil's Claw, and the remainder harvested Ximenia. Most households surveyed were located in three regions – Ohangwena, Caprivi, and Omusati (see map in Appendix B and Chapter 2 for more detail). For the regions and PPOs surveyed, this activity contributed to household income to varying degrees, with the proportions of income for each INP being 16 percent (Devil's Claw), 2 percent (Marula), and 4 percent (Ximenia). Just over half of the households surveyed were headed by a female, and they were typically comprised of 3-10 people.

All tables in this chapter are population-weighted unless otherwise stated.

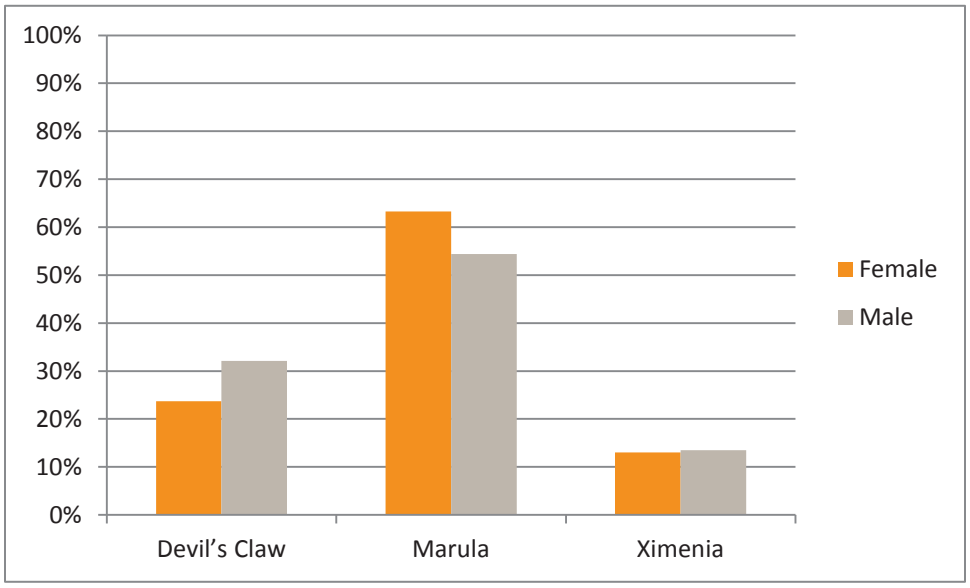
4.1 Composition of PPO Households

In this section, we examine many different characteristics of INP households, paying special attention to differences between male- and female-headed households and to regional differences. Among the 296 PPO households surveyed, 51.6% are headed by a female and 48.4% by a male. Of all female-headed households, most harvest Marula, as seen in Table 43 – 63.3% of all female-headed households harvested Marula, compared to only 54.4% of male-headed households, and 32.1% of male-headed households and 23.7% of female-headed households harvested Devil's Claw, although these differences are not statistically significant. Equal proportions (about thirteen %) of male- and female-headed households harvested Ximenia..

Table 43: Distribution of PPO households, by type of PPO (%)

PPO type	All	Female	Male
Devil's Claw	27.7	23.7	32.1
Marula	59.0	63.3	54.4
Ximenia	13.3	13.0	13.5
Total	*100.0*	*100.0*	*100.0*

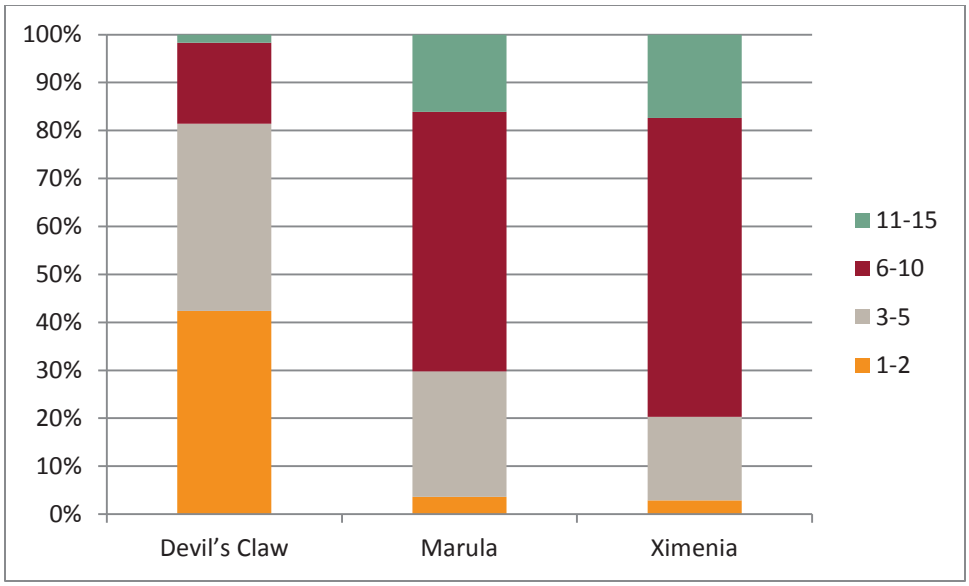
Distribution of PPO households, by size of household (%)



Interestingly, households harvesting Devil's Claw are statistically significantly smaller ($p<0.05$) than those harvesting Marula and Ximenia (Table 44). While 42.4% of households harvesting Devil's Claw have only one or two members and about 80% have five or less, more than 70% of both Marula and Ximenia harvesters have more than five household members.

Table 44: Distribution of PPO households, by size of household (%)

Household size	Percent of all households		
	Devil's Claw	Marula	Ximenia
1-2	42.4	3.6	2.9
3-5	39.0	26.2	17.4
5-10	16.9	54.2	62.3
11-15	1.7	16.1	17.4
Total	*100.0*	*100.0*	*100.0*



While most regions included in the Survey tended to be similarly-distributed between male- and female-headed households, a few stand out (Table 45). One such region is Caprivi[16], where 24.3% of male-headed households and only 10% of female-headed households reside ($p<0.05$). A similar difference in the distribution of female vs. male-headed households is found in Omaheke where 10% of female-headed households and 1% of male-headed households reside ($p<0.05$). There is a similar trend in Otjozondjupa, where 6.8% of male-headed households and only 3.6% of female-headed households reside, although this difference is not statistically significant.

Table 45: Distribution of PPO households, by region

Region	All	Female	Male
Caprivi	16.5	10.0	24.3
Ohangwena	40.3	42.3	38.2
Omaheke	5.6	10.0	1.0
Omusati	15.8	17.0	14.5
Oshana	6.7	6.1	7.3
Oshikoto	9.5	10.9	8.0
Otjozondjupa	5.2	3.6	6.8
Total	*100.0*	*100.0*	*100.0*

Male-headed households in our sample are, on average, slightly larger than female-headed households ($p<0.05$) (Table 46); the mean and median numbers of household members in male-headed households are 7, while for female-headed households they are 6 and 5, respectively.

[16] Only one PPO was sampled in Caprivi, so the results are not representative of the whole region.

Table 46: Size of PPO households, by head of household gender

Gender	Mean	Median	SD
Female	5.9	5	3.3
Male	7.1	7	3.6

Table 47 shows the distribution of children per household for female vs. male-headed households. Even though, the results seem to indicate that female-headed households tend to have fewer children than female-headed households (e.g. 61% of households with less than 3 children are female-headed), these differences are not statistically significant.

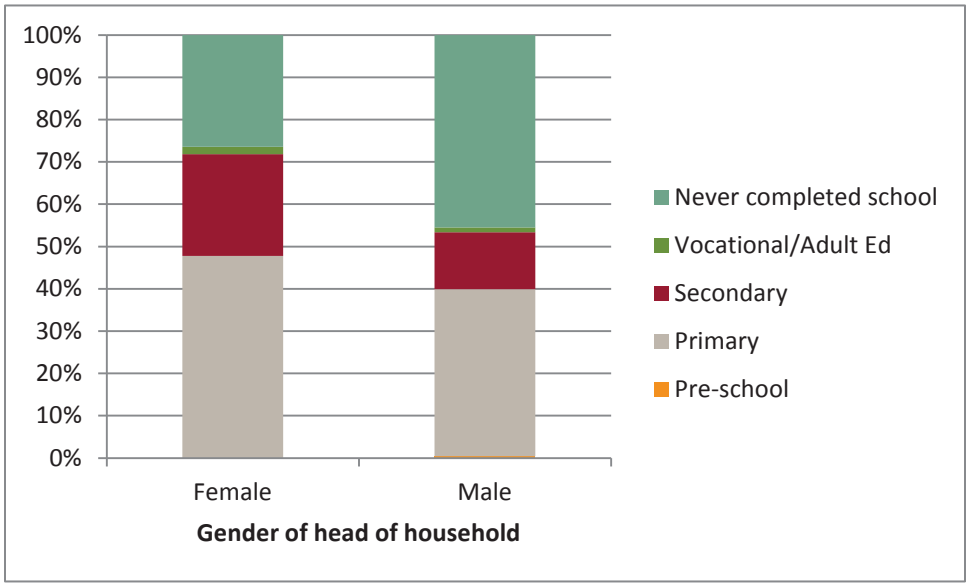
Table 47: Child distribution of PPO households, by head of household's gender

Head of HH gender	Percent of family size category			
	< 3 children	3-5 children	6-7 children	+8 children
Female	60.8	46.6	43.0	48.7
Male	39.2	53.4	57.0	51.3
Total	*100.0*	*100.0*	*100.0*	*100.0*

Most heads of household – both male and female – either never completed school, or only completed a primary education, as shown in Table 48. About 26% of female heads of households in our sample completed secondary or vocational/adult education, while this is the case for 15% of male heads of households, and 26% of female-headed households in our sample never completed school compared to 45% of our male-headed households. However, these differences are not statistically significant at the 5% level (chi-square test yielding a p-value of 0.053).

Table 48: Highest completed level of education of PPO households, by head of household gender

Highest level completed by head of household	Percent of gender		
	All	Female	Male
Pre-school	0.2	0.0	0.4
Primary	43.8	47.8	39.5
Secondary	18.9	24.0	13.5
Vocational/Adult Ed	1.4	1.8	1.1
Never completed school	35.7	26.4	45.5
Total	*100.0*	*100.0*	*100.0*



Though English is the official language in Namibia, very few households use it as their primary language at home (Table 49) – which is to be expected given cultural norms and the fact that English only became an official language after independence. The majority of households surveyed use Oshiwambo, followed by Khoisan and other languages. Statistically significantly more male-headed households in our sample speak Khoisan than female-headed households (25% vs. 10%; $p<0.05$).

Table 49: Language distribution of PPO households, by gender

Language	Both	Head of household gender (percent)	
		Female	Male
Rukavango	0.5	0.9	0.0
Khoisan	17.4	10.0	25.3
Oshiwambo	72.3	76.3	67.9
Damara/Nama	1.9	2.7	1.0
Other	*8.0*	10.0	5.8
Total	*100.0*	*100.0*	*100.0*

Male heads of households surveyed were 61 years old on average, and female heads of households were 58 years old on average; however this difference is not statistically significant.

Table 50: Age of PPO households, by head of household gender

Head of household gender	Age		
	Mean	Median	Standard deviation
Female	58.3	59	16.8
Male	61.1	64	17.8

While the mean ages of female vs. male heads of household was not statistically significant, there are some differences in the distribution of ages of household heads. Approximately 27% of female heads of households fall between the ages of 35 and 49 (Table 51), while 12% of male heads of households fall within this range ($p<0.05$). No significant difference was found in any of the other categories, however.

Table 51: Age distribution of PPO households, by head of household's gender

Age of head of household	Percent		
	Both	Female	Male
17-24	0.5	0.0	1.0
25-34	9.1	7.4	10.9
35-49	20.2	27.3	12.4
50-64	29.5	30.2	28.7
65+	40.7	35.1	47.0
Total	*100.0*	*100.0*	*100.0*

Own-farm activities are evenly split between males and females. Conservancy activities are done by statistically significantly more men than women ($p<0.05$). On the other hand, there are no statistically significant differences between female and male members in wage income activities and own-business

activities.. Finally, statistically significantly fewer women are not working but in school, as compared to men ($p<0.05$).

Table 52: Labour activity of household members over 16 y/o, by gender (percent)

Labour status	Female	Male	Total
Own-farm activities	47.8	52.2	100.0
INP-related activities	49.4	50.6	100.0
Other crops	50.5	49.5	100.0
Small and large stock	53.3	46.7	100.0
Wage income	42.1	57.9	100.0
Conservancy-related activities	0	100.0	100.0
Own-business activities	53.6	46.4	100.0
Not working nor attending school	28.2	71.8	100.0
Not working but in school	33.9	66.1	100.0

4.2 PPO household standard of living measures

We now examine standard of living measures for PPO households, specifically looking at income, expenditures and assets value.

Living standards by PPO

In Table 53 we show these standard of living measures by PPO. Note that numbers followed by an asterisk indicate that there were less than ten observations in that particular PPO. These measures vary greatly by PPO, with Omuntele Association showing a negative average income and Ohole Association showing the highest mean income at NAD 18,200 per household. We also note that there is no clear relationship between the three different standard of living measures; for instance Ohole Association which has the highest mean income only has a mean household assets value of NAD 1,660 as compared to Okahulo Association which also shows a relatively high mean income and the highest mean household assets value at NAD 54,797. However, when we consider the PPO household sample as a whole, we do find a correlation between mean income and mean expenditures (significant correlation of 0.4) and between mean expenditures and mean assets value (significant correlation of 0.7).

As mentioned in the CS section, one question is which of the three indicators is the best measure of standard of living and which one should be used for the impact evaluation, while keeping in mind that MCC's focus is on income while NHIES uses household expenditures as a proxy for income.

Table 53: Household income, expenditure, and assets, by PPO (2011 NAD)

PPO Name	PPO size[(a)]	Mean income	Mean expenditures	Mean assets
Kyaramacan Association		1,848	4,927	646
Epandulo Association (EWC)		14,382	12,203	19,044
Lyeendongula Association (EWC)		7,653*	15,857	13,252
Meameno Association (EWC)		13,929	12,174	19,948
Diinina Association (EWC)		9,464	12,488	7,642
Tulongeni Twahangana Producers		9,766	9,747	7,321
Okahulo Association (EWC)		15,591*	16,704	54,797
Tunetu Association (EWC)		8,142*	9,407	22,460
Gwamiitayi Association (EWC)		12,213	7,157	29,075
Omafa Association (EWC)		11494*	8,524	42,900
Ohole Association (EWC)		18220*	4,582	1,660
Shifula Association (EWC)		14,128*	15,448	31,306
Nkugoyepongo Association (EWC)		9,263	6,548	18,803
Omuntele Association (EWC)		-500*	9,510	11,479
Kuupenda Association (EWC)		8,075	14,234	7,225
SHDC Tjaka Ben Hur		11,314	9,505	19,542
Nyae Nyae Conservancy		2,113*	868	50
NaJaqna Cons and Mkata Community		3,958*	5,009	137

Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.
*Less than 10 observations. (a) Data still to be acquired from implementers (see Chapter 5.3).

Living standards by region

Table 54 below shows the three standard of living measures along with standard deviations and an upper 95% confidence limit for household expenditures. The NHIES estimates given have been adjusted according to the methodology presented in Chapter 1. It is interesting to note that Ohangwena, Omaheke, Omusati and Oshana regions all show similar levels of income, assets and expenditures (approximately NAD 11,000 for income, and approximately NAD 10,000-11,000 for expenditures). Also of note is that Omusati and Oshana display mean incomes statistically significantly greater than the point estimate of their median household incomes, a sign of income inequality, two regions have approximately equal means and medians, and the two regions with problematic values for mean income

(Caprivi and Otjozondjupa) may be considered like the first set if the mean household expenditure is used to proxy household income.[17]

Table 54: PPO household income, expenditure, and assets, by region (2011 NAD)

Region	Household income			Household assets		Household expenditures			NHIES income (adj.)*
	Mean	SD	Median	Mean	SD	Mean	SD	Upper 95%	Mean
Caprivi	1,849	2,220	1,200	646	1,569	4,927	3,928	6,458	7,497
Ohangwena.	11,246	9,217	10,495	12,105	24,878	11,794	9,764	13,339	17,944
Omaheke	11,314	7,083	10,343	19,542	40,488	9,505	5,156	12,986	14,462
Omusati	10,774	11,763	7,133	25,306	44,879	10,968	10,139	14,039	16,688
Oshana	11,783	7,617	8,520	23,165	44,974	10,192	11,350	15,424	15,507
Oshikoto	7,718	4,861	8,626	7,382	11,408	14,059	6,799	16,689	21,390
Otjozondjupa	3,267	1,909	2,000	97	115	3,127	2,307	4,754	4,757

*These NHIES (2006) household "income" figures for 2003/4 are from Table 6.7. The NHIES accompanying text indicates that in fact the figures are based on household expenditures. These figures have been adjusted for the above-table in three ways: for rural households, for long-form vs. short-form data collection instruments and for inflation (CPI reference: http://www.gocurrency.com/countries/namibia). See text for details.

**Observations larger than $500,000 were not considered.

Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.

Similarly to the CS section, we note that standard deviations for income and expenditure estimates are generally of the same size as the mean, which shows that our indicators are probably stable and therefore adequate for impact evaluation. This therefore suggests that the minimum detectable effect size (roughly, the change desired for the indicator as a result of the intervention divided by the standard deviation) can be achieved with a reasonable sample size such as is available for the CS-INP case.

Table 55 below shows the share of income from different sources. For instance in Caprivi, on average 50% of household income come from agricultural activities (mostly INP activities) while 10% come from conservancy-related activities. Only in Caprivi and Omaheke does most of the income come from agricultural activities and in fact only Caprivi households seem to rely on INP activities as their main source of income. Households in other regions rely on either wage income or non-labor income as their main sources of income.

[17] Median household income for the whole sample is 7,020 NAD.

Table 55: Distribution of household income, by economic activity and region (percent)

Economic activity	Caprivi	Ohang-wena	Oma-heke	Omusati	Oshana	Oshikoto	Otjozon-djupa
Agricultural	50	0	41	-1	-3	3	23
INP	48	2	5	2	4	9	23
Other Crops	0	0	0	1	0	0	0
Livestock	2	-3	36	-5	-7	-6	0
Conservancy	10	0	0	0	0	0	17
Wage income	27	47	27	42	21	12	0
Own-business activities	0	1	6	6	0	2	10
Non-labor income	12	52	26	53	82	82	50
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Note: "0" values are less than 0.4 percent

The demographics of PPO households' living standards

In this section, living standards among different demographic groups are examined. Average income for male-headed households is statistically significantly higher than that of female-headed households (NAD 10,897 for male-headed households vs. NAD 7,379 for female-headed households; $p<0.05$). A similar trend appears for mean household assets and expenditures (Table 56), although the differences are not statistically significant.

Table 56: Household income, expenditure, and assets by head of household's gender

Head of household's gender	Household income (NAD)	Household assets (NAD)*	Household expenditures (NAD)
Female	7,379	10,848	9,859
Male	10,897	13,943	10,195

*Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.

Household income, expenditure, and assets by head of household's gender

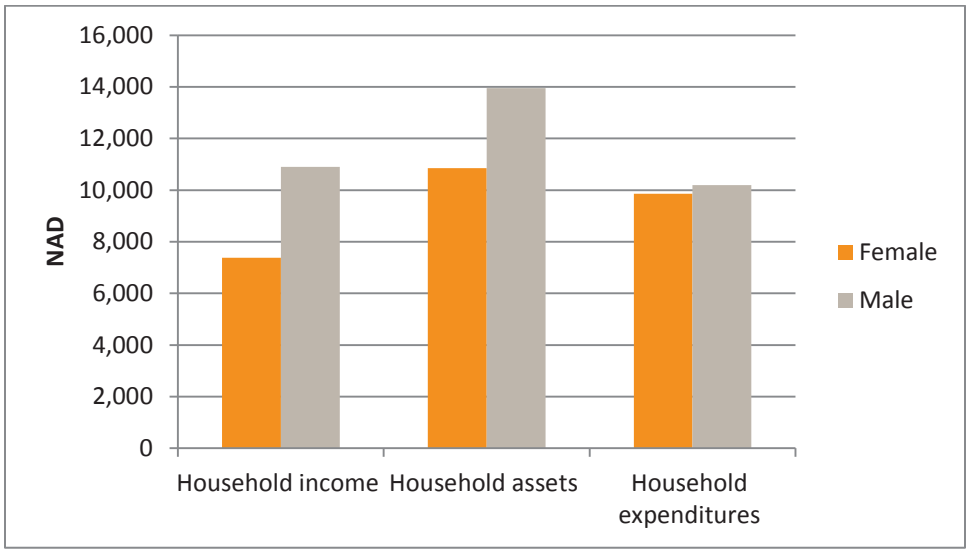


Table 57 shows an interesting statistically significant relationship between the age of the head of household and all three standard of living measures. As age of head of household increases, so do mean household income, household assets and household expenditures (comparisons between all age categories for each indicator – income, assets and expenditures – are all statistically significant; $p<0.05$).

Table 57: Household income, expenditure, and assets, by head-of-household age

Head-of-household's age	Household income (NAD)		Household assets (NAD)		Household expenditures (NAD)	
	Mean	SD	Mean	SD	Mean	SD
16-24	1,124**	0**	n.d.*	n.d.*	3,970**	0**
25-34	4,073	4,567	1,150	1,419	4,711	2,898
35-49	4,851	5,222	5,656	20,024	8,536	7,339
50-64	9,3948	10,870	14,743	33,629	11,421	8,770
+65	12,483	8,001	17,483	34,783	11,587	10,025

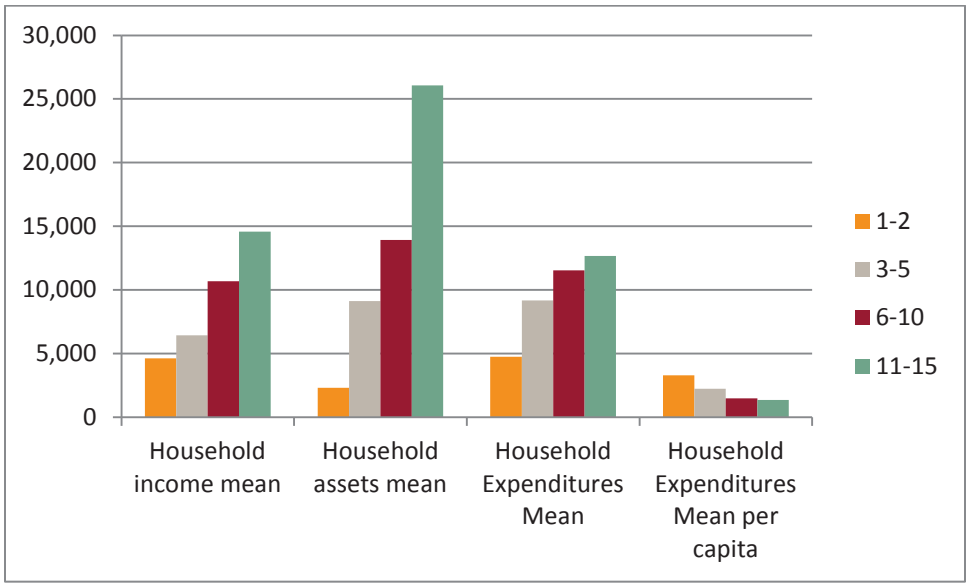
Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.
*n.d.=no data. Data for this variable had missing values. **Contains only one observation.

Finally, we note a statistically significant upwards trend in income, assets and expenditures as household size increases (comparisons between all household size categories for income, assets and expenditures show statistically significant differences; $p<0.05$). As household size increases, the number of active household members who can contribute to household income typically increases as well, so one would expect this tendency. On the other hand, mean expenditures per capita decreases as household size increases (comparisons between all household size categories are statistically significant; $p<0.05$).

Table 58: Household income, expenditures, and assets, by household size (NAD)

Household size	Household income mean	Household assets mean	Household expenditures	
			Mean	Mean per capita
1-2	4,615	2,303	4,742	3,297
3-5	6,445	9,118	9,187	2,233
6-10	10,675	13,934	11,547	1,487
11-15	14,578	26,071	12,666	1,360

Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.



4.3 PPO household agricultural activity

This section examines agricultural activities by the PPO household in the areas of INP production, farming of other crops, and animal husbandry.

INP activities by PPO

Table 59 shows that the average number of years that households have been engaged in INP activities varies by region and species, ranging from 3.6 (Devil's Claw harvesters in Caprivi) to 7.1 (Marula harvesters in Ohangwena). Overall, the number of years Devil's Claw households are engaged in INP activities are statistically significantly lower than those of Marula households ($p<0.05$). Typically (for 81.6% of households), only one household member was a registered member of the PPO, but there were a few which reported that either two or, oddly, no members of the household belonged to a PPO (8.9% with two registered members and 9.7% with no members).

Table 59: Years engaged in INP activities, by INP and region (years)

INP species	Row average	Region						
		Caprivi	Ohang-wena	Omaheke	Omusati	Oshana	Oshikoto	Otjozon-dkupa
Devil's Claw	4.5	3.6	-	6.3	-	-	-	5.7
Marula	6.5	-	7.1	-	7.0	4.5	4.9	-
Ximenia	5	-	4.9	-	-	-	-	-

We expected that the low earnings potential from INPs might make them more attractive to the very poorest households, whose opportunity cost of time would be the lowest. This would suggest a negative relationship between measures of family economic status and participation in INP harvesting. Regression analysis *within* INP, however, suggests that there is no consistent pattern relationship between hours spent harvesting and expenditure quartile (Table 60), which we use as a measure of wealth (quartile I has the lowest expenditures and IV has the highest). The exception to this is Devil's Claw, which fulfills our expectations, but since few Devil's Claw harvesters fall in expenditure quartiles III and IV its results can only be considered indicative. Of course, the lack of observations in quartiles III and IV for Devil's Claw is itself supportive of a priori expectations.

Table 60: Composition of INP harvesting, by household's expenditure quartile

Expenditure Quartile	Devil's Claw	Marula	Ximenia	All INPs
	Average hrs.	Average hrs.	Average hrs.	Average hrs.
I	56.9	26.9	49.0	43.4
II	54.8	25.4	41.1	41.6
III	38.1*	21.6	45.5	31.8
IV	34.8*	31.2	42.8	36
Total	*52.3*	*26.7*	*44.1*	*38.5*

* Based on fewer than 10 households.

Interestingly, though few fall in the upper half in terms of expenditures, Devil's Claw-harvesting households earned statistically significantly more revenue from the sale of their harvest than other INP-harvesting households ($p<0.05$); despite the fact that they harvested less than other households (the difference in production is significant between Devil's Claw and Marula households ($p<0.05$), and not between Devil's Claw households and Ximenia or Melon Seeds households although our sample size may be too small to detect such differences). They stored relatively small amounts compared to harvesters of other crops. Marula- and Ximenia-harvesting households earned similar amounts of revenue. Melon seed harvesting does not seem lucrative compared to harvesting the other INPs, but the number of households that harvested melon seeds in our sample is very small (n=13) so the results are not indicative (mean melon seed sales revenue is statistically significantly lower than all other INPs, $p<0.05$) Melon Seeds is no longer part of the Activity, so the "Melon Seeds harvesting households" represented in the table do not come from melon seed harvesting PPOs' member lists. These

households in fact harvest another INP as their primary INP, and coincidentally happened to also harvest some melon seeds, which explains their small number.

Table 61: Allocation of INP harvesting, by INP

INP	Production	Own consumption	Inventory	Sales
	kg*	kg*	kg*	NAD
Devil's claw	127.6	3722.7[f]	54.7 [f]	778[a]
Marula	338.6[b]	76.8	143.5[c]	447
Ximenia	239.1[d]	40	94.7[e]	487
Melon seeds*	41.6	40 [f]	50 [f]	127 [f]

*Melon seeds are measured in liters, not kilograms. (a) Outlier of 3,600 removed for this calculation. (b) Outlier of 3,750 removed for this calculation. (c) Two outliers above 1000 removed for this calculation. (d) Two outliers above 5000 were removed. (e) Outlier of 2,450 removed from this calculation. (f) Based on fewer than 10 households.

Typically, one would expect that the amount of crop harvested and the revenue earned would increase as expenditures on inputs increase (Table 62), however our data does not seem to show this tendency.

Table 62: Allocation of INP harvesting, by end use and household income

INP/Expenditure Quartile	Production	Own consumption	Stock (mean)	Sales (mean)
	mean kg	mean kg/ℓ.*	kg/ℓ.*	NAD
Devil's claw				
I	124.7	5075	63.25	803
II	152.2	100	37.5	915
III	71.4**	-	-	486**
IV	126.1**	-	-	561**
Marula				
I	417.1	93.2	148.8	415
II	384	83.9	150.9	410
III	272.7	50	98.5	447
IV	316.2	78.1	169.7	489
Ximenia				
I	253	60**	50**	388
II	227.6	37.5**	74**	582
III	231.3	35**	100**	445
IV	260.7	-	200**	481
Melon seeds (ℓ)				
I	-	-	-	-
II	27.4**	25**	50**	275**
III	34.5**	125**	-	56**
IV	60**	25**	50**	101**

Note: Household expenditure is used as a measure of household medium-term income. There was no harvesting of Comminphora or Mopane seed. *Except for its production, melon seed is measured in liters, not kilograms. **Based on fewer than 10 households.

Production and storage of INPs, as well as revenue earned, seem to be positively correlated with family size (Table 63). This would make sense as larger households would tend to have more active members who can participate in INP activities. For instance, the correlation between production and family size is positive and significantly significant for Devil's Claw. However, these correlations are not significant for the other INPs, though our sample sizes may be too small to detect such patterns statistically.

Table 63: Allocation of INP harvesting, by INP and family size

INP/Family size	Production	Own consumption	Stock (mean)	Sales (mean)
	mean kg	mean kg/ℓ.*	kg/ℓ.*	NAD
Devil's claw				
0-2	99	5,075**	27**	736
3-5	146	-	69**	905
6-10	147	100**	-	570
11-15	200**	-	-	1,200**
Marula				
0-2	140**	-	63**	286**
3-5	301	89	108	517
6-10	357	67	163	403
11-15	383	97	139	520
Ximenia				
0-2	115**	-	100**	500**
3-5	213	23	125**	370
6-10	206	45	99	504
11-15	423	38	43**	543
Melon seeds (ℓ)				
0-2	-	-	-	-
3-5	73**	25**	50**	74**
6-10	24**	25**	50**	49**
11-15	43**	125**	-	325**

Note: There was no harvesting of Comminphora or Mopane seed. * Except for its production, melon seeds are measured in liters, not kilograms. **Based on fewer than 10 households.

Engagement in other crop activities by PPO households

Table 64 shows that 79% of female-headed households and 71% of male=headed households that were surveyed participated in other crop activities, although this difference is not statistically significant.

Table 64: Engagement in other crop activities, by harvester head-of-household gender

Head of household gender	Percent of gender		
	Engaged	Not engaged	Total
Female	78.6	21.4	100
Male	71.4	28.6	100

The four major non-INP crops grown and harvested by households are mahangu, sorghum, beans, and maize. Mahangu is grown by households in all regions, while sorghum, beans, and maize are each grown in at least four of the seven included regions. Although the male-headed households in our sample produced 1,049 kg of sorghum as compared to 198 kg for the female-headed households, this difference is not significant. For other crops, male- and female-headed households produced similar amounts.

Table 65: Crop production for four major crops

Category	Subcategory	Production (kg)			
		Mahangu	Sorghum	Beans	Maize
Region	Caprivi	650.0	-	-	200*
	Ohangwena	774.2	201.4	162.2	183.2
	Omaheke	50*	-	-	-
	Omusati	1,580.0	280.9	156.3	125.0
	Oshana	1,260.3	136.1	263.8	-
	Oshikoto	845.2	3610.3	279.3	100.0
	Otjozondjupa	300*	-	100*	200*
Gender	Female	939.3	197.9	184.9	166.0
	Male	1,057.3	1,048.7	188.3	145.7

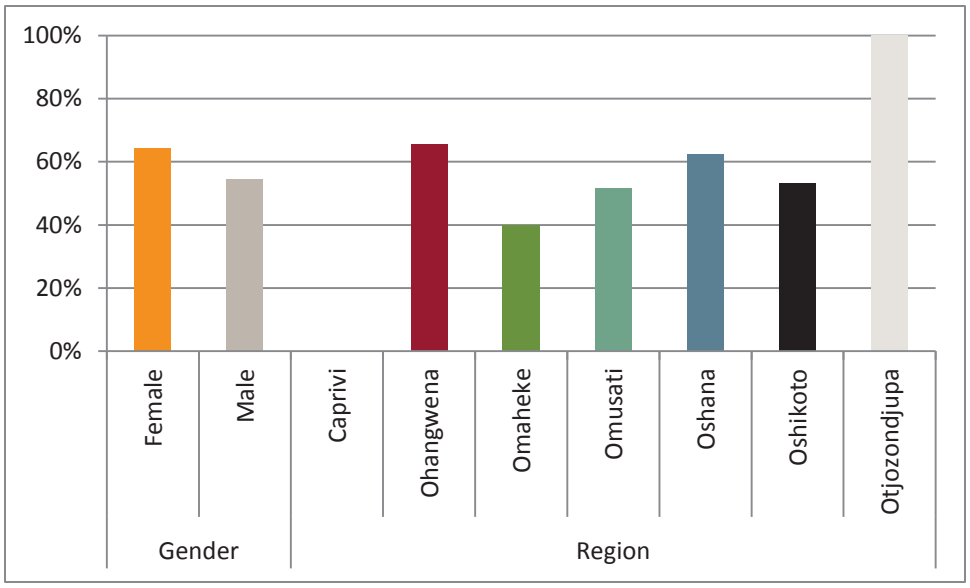
* Only one observation

An indication of the importance as well as function of farming to INP households is the degree to which they consume what they harvest, as opposed to sell or trade. Table 66 examines the end-use of other-crop production by gender of the head of household and by region. The results suggest that female-headed households depend more on these other crops for direct sustenance than do male-headed households ($p<0.01$). This is to be expected since the former tend to be poorer. One region seems to stand out – Otjozondjupa – where households consume 100% of what they've harvested; however there are too few observations in this region for the results to be statistically meaningful.

Table 66: Average share of production consumed by household

Category	Subcategory	Share of production consumed by household
Gender	Female	64.4
	Male	54.6
Region	Caprivi	0*
	Ohangwena	65.6
	Omaheke	40*
	Omusati	51.6
	Oshana	62.5
	Oshikoto	53.1
	Otjozondjupa	100*

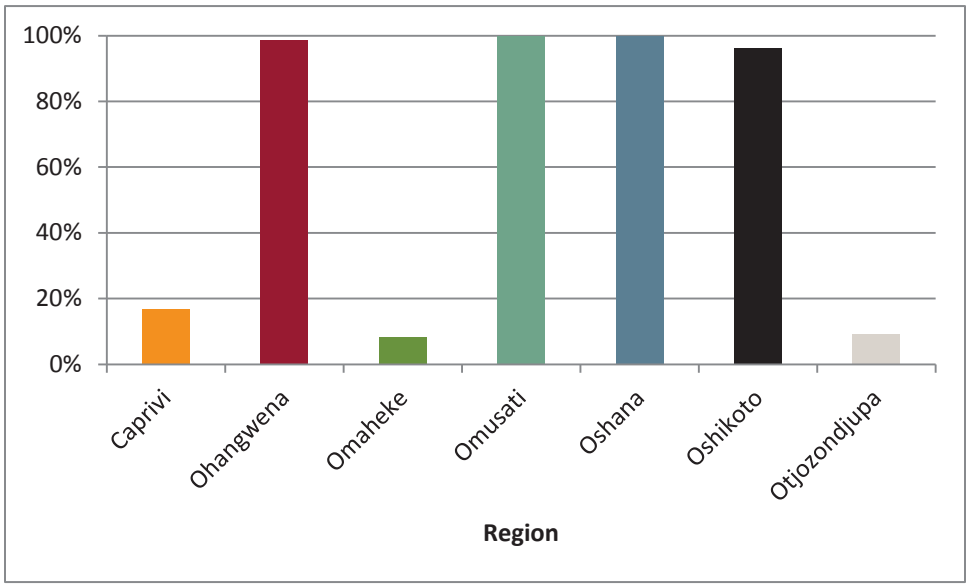
*Too few observations to be statistically meaningful.



Growing non-INP crops varies greatly by region. The vast majority of INP harvesters in Ohangwena, Omusati, Oshana, and Oshikoto grow other crops, while most of the harvesters in Caprivi, Omaheke, and Otjozondjupa do not (differences between the former three regions and later three are significant, $p<0.05$) (Table 67). These differences mirror the differences in INP harvested – where Devil's Claw is harvested, no other crops are usually grown; however, in regions where Marula and Ximenia are harvested, the households tend to harvest additional crops. This situation may be reflective of the traditional agricultural practices in each region.

Table 67: Engagement in other crop activities, by region

Region	Percent of region		
	Engaged	Not engaged	Total
Caprivi	16.7	83.3	*100.0*
Ohangwena	98.75	1.4	*100.0*
Omaheke	8.3	91.7	*100.0*
Omusati	100.0	0	*100.0*
Oshana	100.0	0	*100.0*
Oshikoto	96.3	3.7	*100.0*
Otjozondjupa	9.1	90.9	*100.0*

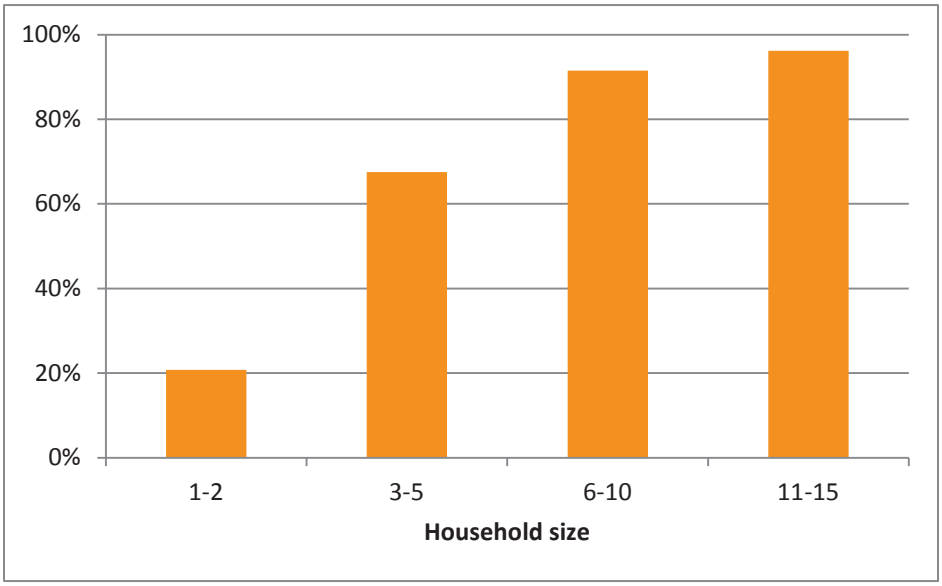


The rate of engagement in non-INP crop activities increases by household size, as shown in Table 68.[18] This is likely due to the fact that larger households require more income, and thus collect income from more sources than smaller households. This may also be due to traditional agricultural practices in various regions.

[18] This is confirmed by correlation analysis and by logit analysis relating household size to probability of engaging in other crops.

Table 68: Engagement in other crop activities, by harvester family size

Number of household members	% of households	% of households engaged	% of households not engaged	Total
1-2	14.3	20.8	79.2	*100.0*
3-5	28.6	67.5	32.5	*100.0*
6-10	44.9	91.5	8.5	*100.0*
11-15	12.3	96.2	3.8	*100.0*
Total	*100.0*	*75.1*	*24.9*	*100.0*



Livestock activities by PPO households

Now we examine the PPO households' participation in livestock activities, paying close attention to possible differences across demographic lines. Households in the PPO sample generally participated in livestock activities in addition to their agricultural activities (at a rate of 86% for all households (Table 69). Female-headed households appear to be slightly more dependent on livestock than their male-headed counterparts ($p<0.1$).

Table 69: Livestock activities of harvesters, by head-of-household gender

Head of HH gender	Percent			Average number of animals by household
	Yes	No	Total	
Female	90.0	10.0	*100.0*	33.9
Male	82.1	17.9	*100.0*	40.1
Total	86.2	13.8	*100.0*	36.9

Participation rates in livestock activities among PPO households are divided across regional lines in much the same way that they were among conservancy households (Table 70). Caprivi, Omaheke, and especially Otjozondjupa have relatively low participation rates, statistically significantly lower than all others where nearly all households raise livestock ($p<0.05$).

Table 70: Livestock activities of INP households, by region

Region	Percent			Mean number of animals by household
	Yes	No	Total	
Caprivi	58.3	41.7	*100.0*	9.1
Ohangwena	99.5	0.5	*100.0*	40.9
Omaheke	66.7	33.3	*100.0*	53.4
Omusati	100.0	0.0	*100.0*	52.4
Oshana	100.0	0.0	*100.0*	39.0
Oshikoto	100.0	0.0	*100.0*	52.2
Otjozondjupa	3.1	90.9	*100.0*	0.5
Total	*86.2*	*13.8*	*100.0*	*36.9*

4.4 PPO household-declared training and meeting participation

Now PPO households' participation rates in trainings and PPO meetings are examined, looking for differences between gender and ages of household heads, along with household income ranges.

About 90% of all households surveyed attended at least some trainings or meetings organized by the PPO in the past 12 months (Table 71), and this trend holds true regardless of the age of the head of household. At least 42% of households with heads under 65 attended all meetings. Households with heads 65 or older seem to attend relatively fewer meetings – 40% attended only some, and 11.5% attended none; however this is not statistically significant, although this lack of statistical significance could be due to the small sample size. If it were statistically significant, this finding would be somewhat unexpected, since older people presumably have more time available and lower opportunity costs; on the other hand, health issues among the older population or their lack of direct involvement in INP harvesting may help explain the lower attendance rates.

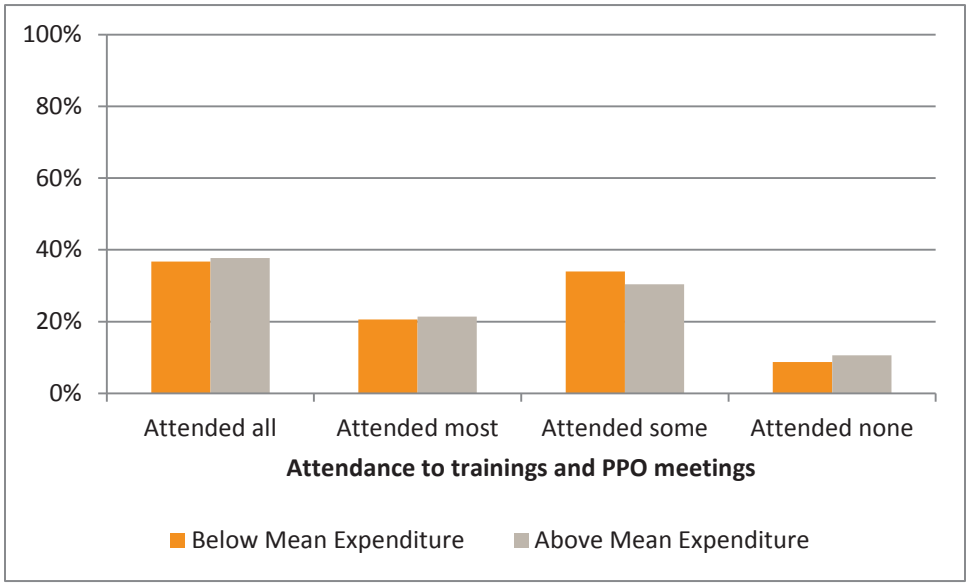
Table 71: Frequency of attending trainings or PPO meetings, by head of household

Age	Age group's share of all households	Percent of household head age group				
		Attended all	Attended most	Attended some	Attended none	Total
16-25	0.5	100.0	0.0	0.0	0.0	*100.0*
26-35	9.17	51.0	5.6	37.8	5.6	*100.0*
36-50	20.2	44.3	25	25.5	5.2	*100.0*
50-64	29.5	42.1	22.3	23.9	11.7	*100.0*
65+	40.8	26.3	22.2	40.0	11.5	*100.0*
Share of all households	100.0	36.6	21.5	32.0	9.9	*100.0*

Interestingly, no statistically significant differences were found in the attendance rates when comparing households with low- and high-expenditures (Table 72) – the distribution rates are nearly identical among both groups.

Table 72: Distribution of household attendance of trainings or PPO meetings, by relation to median household expenditure

Frequency of attending	Below Median Expenditure	Above Median Expenditure
	% of Column	
Attended all	36.7	37.7
Attended most	20.6	21.4
Attended some	34.0	30.4
Attended none	8.7	10.6
Total	*100.0*	*100.0*

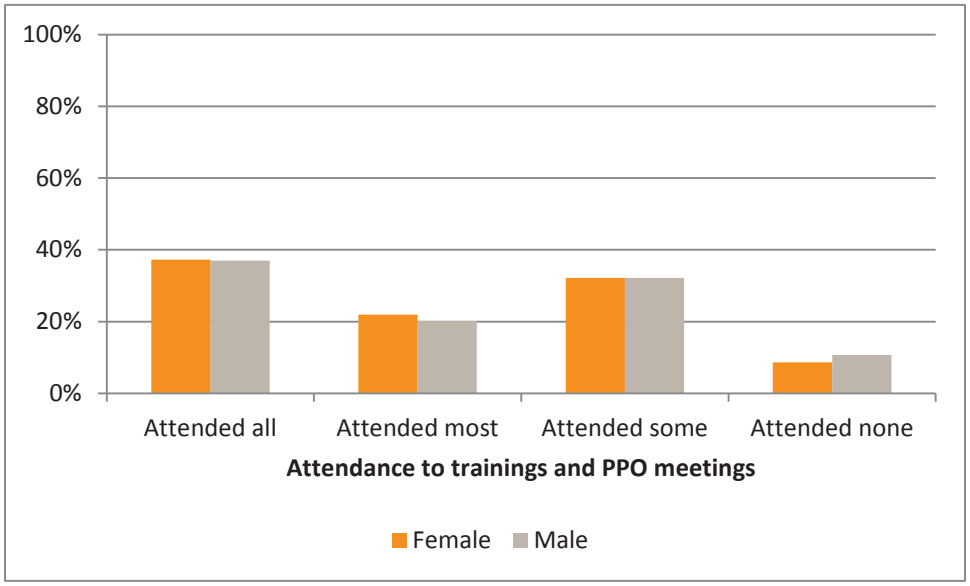


Similarly, there is no statistically significant difference in the distribution of attendance rates among male- and female-headed households in Table 73.

Table 73: Distribution of gender's attendance of trainings or PPO meetings, by head of household gender

Frequency of attending	Head of household gender	
	Female	Male
Attended all the meetings	37.3	37.0
Attended most of the meetings	21.9	20.1
Attended some of the meetings	32.2	32.2
Attended none of the meetings	8.6	10.7
Total	*100.0*	*100.0*

Distribution of gender's attendance of trainings or PPO meetings, by head of household gender



There are some very interesting differences in participation rates among regions in Table 74. While 27.2% of households overall attended all the meetings, no households in Oshana did so while, on the other end of the spectrum, 69% of households in Caprivi did so. In Caprivi and Omaheke, no households reported that they attended none of the trainings or PPO meetings. In Oshana, a relatively high percentage of households – 61% - attended some of the trainings or PPO meetings. This will be investigated further during the next data collection activities and upcoming focus group discussions.

Table 74: Distribution of household attendance of trainings or PPO meetings, by region

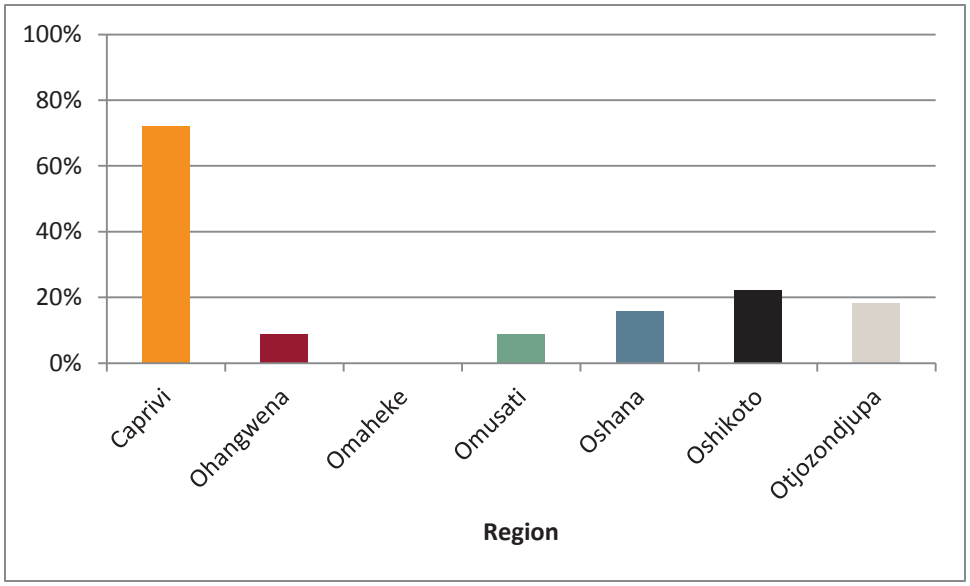
Region	Attended all	Attended most	Attended some	Attended none	Total
Caprivi	69.0	6.9	24.1	0.0	*100.0*
Ohangwena	32.0	28.3	28.2	11.4	*100.0*
Omaheke	37.5	25.0	37.5	0.0	*100.0*
Omusati	31.1	8.9	44.4	15.6	*100.0*
Oshana	0.0	27.8	61.1	11.1	*100.0*
Oshikoto	40.0	24.0	28.0	8.0	*100.0*
Otjozondjupa	55.6	22.2	22.2	11.1	*100.0*
Total	*37.2*	*21.0*	*32.2*	*9.6*	*100.0*

Training (only) attendance of PPO households

Now, we turn to trainings received by households in the past 12 months – this is in contrast to the previous tables in this section, which examined trainings as well as PPO meetings. By looking first at regional differences in Table 75, we find that the Caprivi region is statistically significantly more active in trainings (72.2% of household members) ($p<0.05$). Household members in Ohangwena, Omaheke, and Omusati are particularly inactive, with no household members in Omaheke having received training. This will be investigated further during the next data collection activities and in focus group discussions.

Table 75: Distribution of household participation in trainings, by region

Region	Percent household members receiving training		Total
	Yes	No	
Caprivi	72.2	27.8	*100.0*
Ohangwena	8.9	91.1	*100.0*
Omaheke	0.0	100.0	*100.0*
Omusati	8.9	91.1	*100.0*
Oshana	15.8	84.2	*100.0*
Oshikoto	22.2	77.8	*100.0*
Otjozondjupa	18.2	82.8	*100.0*
Total	*21.3*	*78.7*	*100.0*

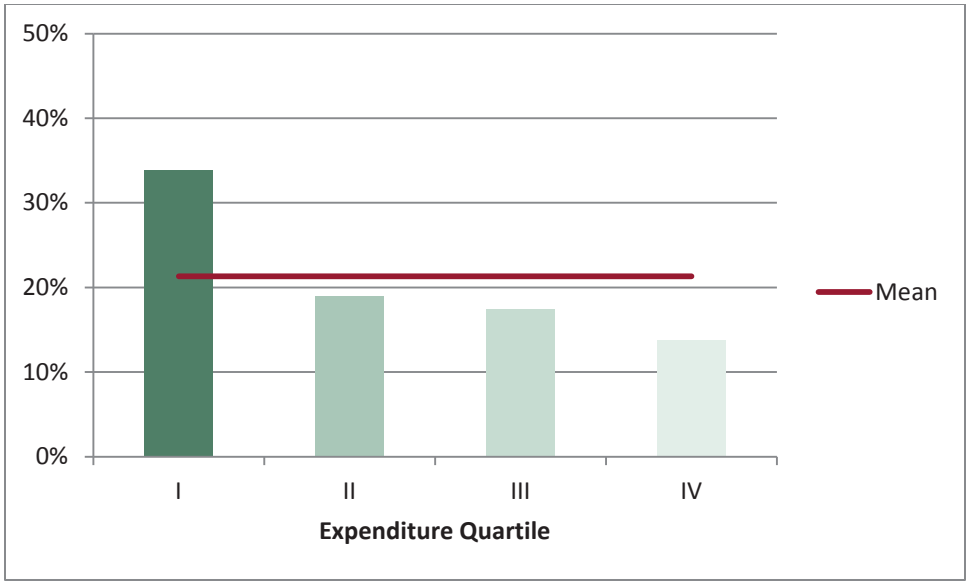


Households with lower expenditures tend to participate in trainings more often than those with higher expenditures (in Table 76 note that quartile I is the lowest expenditure group). The difference in participation rate is statistically significant between household members in the first and fourth quartiles ($p<0.05$), but not between the other quartiles, which might be due to our small sample sizes. This negative relationship between participation rates and expenditure quartiles would be expected, however, given these households' likely higher incomes and, hence, higher opportunity costs.

Table 76: Degree income groups participate in trainings

Expenditure quartile	Percent quartile participates in a training		Total
	Yes	No	
I	33.8	66.2	*100.0*
II	19.0	81.0	*100.0*
III	17.4	82.6	*100.0*
IV	13.7	86.3	*100.0*
Total	21.3	78.7	*100.0*

Note: As discussed in text, household expenditure is used as a measure of household medium-term income.

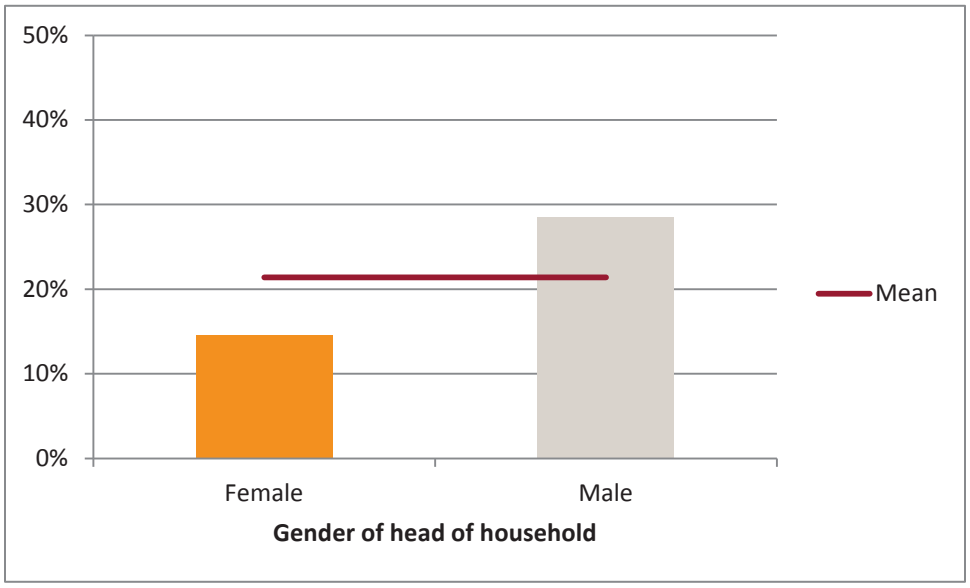


The proportion of male-headed households participating in trainings is about twice that of female-headed households ($p<0.05$) (Table 77).

Table 77: Degree household participates in trainings, by head-of-household gender

Head-of-household gender	Percent		
	Yes	No	Total
Female	14.6	85.4	*100.0*
Male	28.5	71.5	*100.0*
All	21.4	78.6	*100.0*

Degree household participates in trainings, by head-of-household gender



Twenty percent of harvesters in Caprivi were trained, a statistically significantly higher rate than those in any other region ($p<0.05$). In contrast, only 8% in Otjozondjupa, and no more than 3% in any other region participated in trainings.

Table 78: Degree harvesters participate in trainings, by region

Region	Percent		Total
	Trained	Not trained	
Caprivi	19.9	80.1	*100.0*
Ohangwena	1.00	99.0	*100.0*
Omaheke	0.0	100.0	*100.0*
Omusati	1.4	98.6	*100.0*
Oshana	2.0	98.0	*100.0*
Oshikoto	3.4	96.6	*100.0*
Otjozondjupa	8.0	92.0	*100.0*
Total	3.5	96.5	*100.0*

Note: No observations for Kunene or Kavango. This table refers to the share of all *harvesters* across all household who indicated they do harvesting.

Similarly to the previous section, we examine the relationship between participation in trainings and household expenditures. 7.3% of the households in the lowest expenditure quartile attended trainings, while 2% of households in the highest expenditure quartile attended trainings. Although the differences between expenditure quartiles are not statistically significant, this trend does mirror the one in Table 76. As was mentioned previously, households with higher expenditures also tend to have higher incomes and thus a higher opportunity cost which might explain that they tend to attend less trainings.

Table 79: Degree harvesters participate in trainings, by harvester household's income group

Expenditure quartile*	Percent		Total
	Trained	Not trained	
I	7.3	92.7	*100.0*
II	3.3	96.7	*100.0*
III	2.6	97.4	*100.0*
IV	2.0	98.0	*100.0*
Total	3.5	96.5	*100.0*

Note: No observations for Kunene or Kavango. This table refers to the share of all *harvesters* across all household who indicated they do harvesting, unlike Table 77, which examines the share of *households*, themselves.* As discussed in text, household expenditure is used as a measure of household medium-term income.

5. Summary of conclusions

Conclusions are presented in this section. Conservancy-related conclusions are first, followed by INP-related conclusions. Lastly, there is a final assessment of data quality and limitations.

5.1 Conservancy-specific conclusions

A total of 1,032 households in 28 conservancies across seven regions were interviewed as part of the CS baseline survey. These households displayed notable differences in economic conditions, receipt of conservancy benefits, and participation in events and activities across household demographic characteristics and geographic location.

Regarding economic activities, almost all conservancy households rely on their own farming activities to earn income. A small proportion of them perform conservancy activities and their earnings from those activities represent less than 10 percent of the household's income, except for conservancy households located in Kavango (35 percent) and Kunene (20 percent). In general, wage income is the main source of household income across regions. This fact could be associated with the uncertain conditions that farm activities face in these conservancies and that input costs outpace, in most cases, the revenues from agriculture and livestock.

Of those households that receive cash benefits (14 percent) a considerably larger proportion of male-headed households (69 percent) received conservancy benefits in cash than did female-headed households (31 percent). In general, the average size of cash benefits received by households over the previous 12 months was larger among male-headed (754 NAD) than among female-headed ones (706 NAD). In the case of non-cash conservancy benefits, 28 percent of conservancy households received them of which 40 percent were female-headed. The latter received, on average, a larger value of in-kind benefits than male-headed ones, 367 NAD vs. 244 NAD. Further, for those households that received both cash and non-cash benefits (10 percent of all conservancy households) one-third of them were female-headed households. The annual average combined amounts of cash and non-cash benefits together, 3,618 NAD for female-headed and 6,935 NAD for male-headed households, were substantially larger for both genders heads than for those households of the respective gender that received only cash or only non-cash benefits.

Regarding size of conservancy, even if household recipients in smaller conservancies (less than 1,300 members) are least represented in the groups of recipients by type of benefit, the average value of benefits they receive is the highest, especially for cash benefits and for those households that receive both types of benefits.

Turning to the distribution of benefits by linguistic group, Afrikaans-speaking households reported, on average, the highest value of cash benefits across the sample. However, we find a quite-striking

concentration of benefits among those Rukavango-speaking households that receive both cash and non-cash benefits, a figure that is 15,000 NAD larger than cash-only or non-cash-only benefits that Rukavango-speaking households received—and larger than any other group received, regardless of the type of benefit.

In summary, these figures suggest that conservancy benefits are quite unequal across male- and female-headed households, both based on the distribution of households and the average value of benefits. The other demographic and participation characteristics vary in distribution and average value of benefits as well.

The rate of participation of conservancy households in trainings is low, about 11 percent. This is expected given the CS trainings are focused on conservancy management and not individual members or households. Of those that were trained, about half reported that they in turn used the training for something—usually for tour guiding and beekeeping.

5.2 PPO-household-specific conclusions

A total of 296 households containing PPO members were interviewed as part of the baseline survey. Most of the surveyed households were located in either Ohangwena, Caprivi, or Omusati. About 60 percent of households harvest Marula, with the remainder harvesting either Devil's Claw or Ximenia. A slight majority of households are headed by females, driven by the large proportion of such households harvesting Marula. Household heads typically have a primary education or none at all. Most households surveyed had 3-10 members.

On average, the longest-tenured PPO member in the household had been a member for about 5 years, so the households have some experience with PPO activities. This varied by both INP type and region, ranging from 7.1 years for Marula harvesters in Ohangwena to 3.6 years for Devil's Claw harvesters in Caprivi. Household members spent an average of about 39 hours per week harvesting INPs.

Households earned relatively little revenue from INP harvesting—an average of 780 NAD from Devil's Claw, and about 450 to 500 NAD for Marula and Ximenia.[19] In particular, INP revenues contributed 2 to 9 percent of household income, though in Caprivi and Otjozondjupa they were much more important (48 and 23 percent, respectively). Households with higher income (expenditure) typically earned more revenue from INP harvests.

Many households—about 75 percent—are engaged in activities related to non-INP crops as well as INP harvesting. This, however, varies by region; in Omaheke, Caprivi, and Otjozondjupa, there is very little activity in farming but in all other regions this farming is nearly universal. The most-grown crops are

[19] Here we refer to "revenue" instead of "income" since a value-added model was not built into the survey instrument. Hence, only sales were used to estimate the contribution to income from INP activities. Since most INP activity related to harvesting, which almost exclusively uses labor, the revenue approximation is likely to be a good one.

mahangu, sorghum, beans, and maize. Most households (86 percent) also raise livestock, but this also varies somewhat by region.

On average across all INP PPOs total income in the PPO areas surveyed was typically around 10,000 or 11,000 NAD, though in some regions income was significantly lower. Income from INP-harvesting made up a small proportion of total income in all areas but Caprivi and Otjondzupa. Non-labor income is a significant source of income in all regions, and agriculture and wage income each account for large proportions of household income in some regions. PPO households received no income from conservancies except for those in Caprivi and Otjozondjupa, where it contributed 10 and 17 percent, respectively.

Though INP harvesting accounts for a small proportion of households' incomes, they are still quite involved in the PPO (e.g. they are registered harvesters, receive training, harvest and sell). About 60 percent of surveyed households attended most or all of the meetings and trainings organized by the PPO, and an additional 32 while attended some of them. Male- and female-headed households reported similar attendance rates at these events. Other trainings were attended by about 20 percent of households and 2 percent of all harvesters; a relatively larger share of households and harvesters with low income (household expenditure) attended such meetings.

5.3 Assessment of data quality and limitations

An additional benefit of producing this baseline data analysis report is that the NORC team has had to dig deeply into the survey data and familiarize itself with its idiosyncrasies, strengths and, ultimately, limitations. This section focuses on the latter with the operative question of the data's suitability for use in the upcoming impact evaluation and what needs to be done to support this need. Toward this end, we examine the issue from the perspective of conservancy and INP household standards of living, conservancy benefits, non-INP agricultural activities, and participation in training and meetings.

Standard-of-living data

The quality of this data can be assessed for (i) consistency across survey measures and within the survey observational units, (ii) consistency within survey measures and across observational units, and (iii) across surveys.

Consistency across indicators. NORC has included three measures of standard of living in the baseline survey: income, expenditure, and assets. With partial correlations of 0.3 to 0.4, we find a good—but not perfect—agreement among them across stratifications of interest. Even in the one problematic region (from a sampling point of view)—Otjozondijupa—there was agreement: substantially lower values were observed for all three variables.

Consistency across observational units. A typical way to assess the quality of data is to verify that variation in the data across observational units accords with theory and experience. Hence, one would expect, all else equal, economic wellbeing would rise (and, possibly, eventually fall) with the age of the

head of household, be higher for male over female heads of household, rise and then fall with the number of children, be higher in more urban (or more-densely populated) areas, be higher for the better educated, etc. NORC has examined many of these as well as other relationships in the data and they accord with expectations.

Consistency across surveys. Another source of data confrontation is from other surveys of related populations. While these can only provide an indicative yardstick, broad consistency with established existing datasets does engender credibility in a new dataset. NORC has compared the CS-INP surveys the three other (somewhat) independent sources. First and most obviously NORC compared the CS dataset to the INP dataset.[20] It found that regionally, by gender, and by age the two dataset led to consistent assessments of the same stratifications. Second, NORC compared the CS and INP survey standard of living data to its earlier CBRLM survey of cattle farmers. Again, income and expenditure indicators were in broad accordance. Third, NORC compared regional measures of household expenditure from the CS and INP surveys to those of the NHIES LHS of 2003/4. For the regions of overlap (and once adjustments were made to ensure sample comparability) NORC found that the NHIES estimates were within the 95-percent confidential band of the CS and INP estimates for 87 percent of regions; only one region—Otjozondijupa—was significantly different.[21]

Two final items of support must be mentioned. First, MCA-Namibia had independent experts assess the CS and INP survey dataset and gave them favorable grades. Second, NHIES for 1993/1994 reported 38 percent of female-headed households accounted for 25 percent of total consumption. By 2003/2004 NHIES reported 40 percent of female headed households accounted for 29 per cent of total consumption. From our sample we find that 44 percent of female-headed households accounting for 31 percent of total consumption. NORC's figures, therefore, appear to fit the NHIES trend rather well.

Remaining concerns. For some cells within most two-dimensional demographic stratifications, sample size for estimating a measure of household standard of living—especially for the INP harvesters—is too low for meaningful statistical purposes. This implies that in many cases the forthcoming impact evaluation will be able to test attribution only for one characteristic at a time.

While we were impressed with the degree to which the income data tracked household expenditures, concerns remain that respondents may have been challenged by some of the concepts the components of income required from them to recall—especially on the cost side. Moreover some strata registered income category averages with negative values. While this is logically possible (a business can run at a loss), it is less likely for aggregated data and is thus indicative of inadequate sample size.

[20] While they used the same instrument they were applied to completely separate sampling frames and sampling plans and they were administered completely separately.

[21] See Chapter 2 for an explanation based on the nomadic challenges enumerators faced in that region at the time of year the surveys were administered.

While not unusual for asset measurement, the CS-INP surveys yielded asset values of higher variance than for income and expenditure. The principal cause seems to be the number of significant outliers: there were simply too many to suggest enumerator or respondent error. We believe that, again, the cause is inadequate sample size. Administration of a midline survey, replete with a recall model to retroactively expand the baseline cross-section, may reduce this problem, as we expect it to broaden the representativeness of future analysis. For the present report, we have addressed these concerns by removing outlier observations from the analysis.

Bottom-line assessment. The household expenditure indicators show themselves to be both empirically stable and credible as well as theoretically justified indicators of household standard of living with which to conduct impact evaluation. Even in Caprivi region, where income and assets registered among the lowest levels, household expenditure remained at a level commensurate with the other regions. Sample-size issues, as discussed in the Evaluation Design Report, can be addressed for the other measures—as well as for many of the variables discussed in this report—through the midline INP survey currently set for early 2013 (previously known as the mini-survey). Among the objectives of this survey is to broaden the representativeness of future analysis by estimating an econometric "recall model" to expand retroactively the baseline cross-section to include INPs and geographic locations missed by the original baseline survey for the reasons described in the Baseline Survey Report.

Benefits data

One way to gain confidence in the benefits data is to validate it by examining the relationships between the type, size, and frequency of conservancy benefits and member demographics. NORC has made this assessment and finds that the data appear validated. First, larger cash-only benefits appear to go more to households with male heads than with female heads. In fact, male-headed households are more likely to receive each type of benefit. Second, larger cash-only and other non-cash benefits distributions are seen to go to members of conservancies with higher levels of member participation in conservancy meetings as well as in AGMs (both proxies for governance). Third, larger cash benefits distributions and the mean values of all types are associated with more mature conservancies—presumably the very ones that have had time to develop partnerships with private sector lodge and tourism operators. [22] The fact that these relationships carry the signs expected are consistent with the hypothesis that the data are of good quality.

INP production, other crops, and livestock data

Encroachment by household livestock and other-crop activities has been identified as an increasing threat to conservancy objectives. Hence, it is important to track these two activities over the course of the MCC intervention so that impact evaluation can determine whether changes in their levels of

[22] The correlation index between conservancy age and access to cash benefits is equal to 0.09 ($p<0.01$). Furthermore, the correlation between the age of conservancies and the average value of conservancy benefits resulted on indexes equal to: 0.1 for cash benefits, 0.13 for in-kind benefits, and 0.23 for cash plus in-kind benefits ($p<0.05$).

activity (so called "externalities") can be attributed to the intervention. Several data issues that could interfere with this objective were noted during the process of preparing this report.

- Households often used different units of measure in their response to survey questions. Implementer assistance may be needed to provide NORC with the appropriate conversions factors so that household responses can be aggregated for statistical manipulation.

- The sum of the quantity of own-consumption, sales, and changes in inventory can be up to 15 percent different from the quantities of production reported of Other Crops. While some of that could in theory be due to losses from water damage, pests, and the like, it is more likely that respondents did not recall (or report) these quantities accurately. NORC plans to investigate this issue in its upcoming key informant interviews and focus groups. It will also adjust the survey questions in future rounds to ensure this "adding up" condition.

- For the present report, household livestock activity was proxied by the total number of animals it had. For better analysis during the impact evaluation it would be helpful to have valuations of each type of livestock, such as from imputed market (or shadow) prices.

Training and meeting data

As expected, too little training at the conservancy household level was captured in the CS sample to assess data quality sufficiently. This is understandable given that the CS intervention is focused at conservancy leadership. For the INP sample, the case is different and the challenge (as described in the Chapter 2) is that coverage needs to be extended, both geographically and by species. Still there is a high relative degree of participation in training found in the INP dataset. Validation exercises were encouraging. For example, participation fell with household wealth (which is to be expected from their higher opportunity cost of time and from the fact that higher income may be associated with more previous knowledge in the areas covered by the training). This finding holds regardless of whether the unit of analysis is the household (trained or not trained) or the individual harvester (there may be several in a household).

Implementer data

While contract scope and timing made it infeasible, many more useful insights could be generated once conservancy-level and PPO-level indicators and characteristics are included in the baseline analysis. This would occur from two directions.

First, characteristics of a household's economic and social environment are known to have an important influence on standard-of-living outcomes. One source of this "enabling environment" are the institutions to which a household belongs—conservancies and PPOs in the present case. Of course, the surveys capture some of this through their questions on the nature of conservancy benefits received.

Second, the performance of conservancies and PPOs themselves are dependent on the behaviors and characteristics of their members. For example, the growth potential of an organization is typically linked to the quality of member governance. In a volunteer organization this requires free time. Older people are often seen to have more free time than younger people. On the other hand, organizational growth—as well as governance—generally depend on management systems, which require some degree of literacy. A conservancy with a higher proportion of younger households may thus be better educated. Such links between organizational performance and member characteristics could thus be explored once implementer data is combined with the CS-INP baseline data. The upcoming impact evaluation will surely do its best to take advantage of such linkages.