Evaluation Report (Final)

MCA-N Contract: MCAN/COM/RFP/5E01002

Evaluation of MCA Namibia's Conservancy Support and Indigenous Natural Products Activities

December 2014

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NORC at the UNIVERSITY of CHICAGO

Evaluation of MCA Namibia's Conservancy Support (CS) and Indigenous Natural Products (INP) Activities

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LIST OF ACRONYMS

AGM	Annual General Meeting
ARD	Associates in Rural Development, Inc.
CBNRM	Community-Based Natural Resource Management
CBS	Central Bureau of Statistics, now replaced by the Namibia Statistics Agency (NSA)
CDSGF	Conservancy Development Support Grant Funds
CDSS	Conservancy Development Support Services
CRIAA SA-DC	Centre for Research, Information, Action in Africa Southern Africa-Development and Consulting
CS	Conservancy Support
DC	Devil's Claw
EA	Enumeration Area
EWC	Eudafano Women's Cooperative
FGD	Focus Group Discussion
GIS	Geographic Information System
HH	Household
HWC	Human-Wildlife Conflict
INP	Indigenous Natural Product
IPTT	Indigenous Plant Task Team
IRDNC	Integrated Rural Development and Nature Conservation
JV	Joint Venture
KII	Key Informant Interview
MCA-N	Millennium Challenge Account Namibia
MCC	Millennium Challenge Corporation
MET	Ministry of Environment and Tourism
NBRI	National Botanical Research Institute
NACSO	Namibian Association of Community-Based Natural Resource Management (CBNRM) Support Organisations

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)
PPIG	Primary Production Improvement Grants
PPO	Producer and Processor Organisation
PSU	Primary Sampling Unit
SME	Small-Medium Enterprise
TA	Technical Assistance
TTC	Tulongeni Twahangana Cooperative

EXECUTIVE SUMMARY

Introduction and Background

The Millennium Challenge Corporation's (MCC) Compact with the Republic of Namibia aims to reduce poverty through economic growth fostered by investment in the Education, Tourism and Agriculture sectors. The Millennium Challenge Account Namibia (MCA-N) was established to design and implement activities in these three areas to achieve MCC's anti-poverty objective. As part of the Tourism component of the Compact, the Conservancy Support (CS) Activity is developing the capacity of 31 communal conservancies in the Northern Communal Areas (NCAs) to attract investments in ecotourism and capture a greater share of tourism-generated revenue in Namibia. As part of the Agricultural component of the Compact, the Indigenous Natural Products (INP) Activity is assisting Producer and Processor Organisations (PPOs) to improve their product volumes, quality, increase their value-added products, and improve their organisational and business capacity. In addition, the INP Actiivty is enhancing the INP Sector through an Innovation Fund and a Market Bulletin.

NORC was contracted by MCA Namibia to conduct an evaluation of the CS and INP Activities. The evaluation seeks to determine the extent to which observed impacts can be associated with the intervention. The evaluation addresses separate sets of questions for the CS and INP interventions. The evaluation framework is that the outcomes of the interventions are dependent on both the project design (as defined in the Terms of Reference developed by MCA Namibia) and on implementer effectiveness. The following is the current set of research questions for the CS and INP components of the evaluation:

CS Research Questions

1. Do technical support and grants to conservancies increase business partnerships between conservancies and private businesses, and, in turn, increase conservancy revenue?[1]
2. Does technical support to conservancies improve conservancy governance? Does improved governance impact the equitable distribution of conservancy benefits?
3. Is there an increase in conservancy-related employment as a result of the CS activities? If so, how many new jobs are created and at what levels of employment?
4. Do the CS activities lead to an increase in household well-being over the life of its programme?
5. What is the impact of game acquisitions on the conservancies and on their members?
6. How sustainable are the results of business partnerships in terms of increased employment and improved mechanisms for distribution of revenue?
7. What impact does MCA-N support have on conservancy members in terms of the distribution of benefits by gender?
8. What is the perceived impact on recipient-household gender relationships from the intervention?

[1] Conservancy revenue is defined as cash receipts, goods, and services received as payment for services and products sold by the conservancy.

INP Research Questions

1. Do the technical assistance package and the small grants increase the quantity and quality harvested and/or processed by recipients?
2. To what extent has the Delivery of Market Information Sub-Activity contributed to increased understanding of the broader INP sector (e.g., volumes, markets, key players, etc.)?
3. What is the uptake rate and effect of the practices and techniques introduced as part of the technical assistance on recipient harvesters?
4. For the PPO did the technical assistance improve organisational capacity to manage the business and income/revenue?
5. How sustainable are the results in terms of increased production, sales and income? E.g., market chain (are there long-term buyer contracts in place, are the institutions functional and independent).
6. How has the re-organisation of the Indigenous Plant Task Team contributed to the growth and sustainability of the INP sector?
7. How did new developments from the INP Innovation Fund impact on the INP sector?
8. Did the composition and level of household incomes change (more income sources, more diversification, and higher income)?
9. What changes are apparent in intra-household incomes and assets, including specifically around income earned by male and female household members? Does the intra-household distribution of income and employment by male and female household members change?
10. Did household assets change (houses, bicycles, radios, television sets, telephones, etc.)?
11. Did the composition of household financial assets change (savings, debt, borrowing, insurance)?
12. What is the perceived impact on household gender relationships from the intervention among recipients?
13. What is the combined effect of being part of a conservancy and a PPO member among women?

Methodology

Neither CS nor INP activities permit the identification of a compelling counterfactual (control group) for the evaluation of either activity. The CS activity is taking place in many of the conservancies of the NCAs. Conservancies outside of the program's reach are generally in areas with differing natural endowments and market access and, as such, cannot serve as comparable "non-intervention" conservancies (counterfactuals). In the case of the INP sub-activities, it is not feasible to establish a valid control group because the intervention covers nearly the entire population of harvesters of viable INPs.

Due to the lack a of a counterfactual, a design-based (treatment vs. control) approach to evaluation could not be considered, so NORC has instead opted for a model-based approach. This consists of a "before-and-after" design based on a dose-response (or continuous-response-variable) model. The models are estimated using comprehensive information gathered at baseline and endline through household surveys and data collected by the implementing service providers. The quantitative analysis aims to objectively reveal using multivariate statistical methods the stylized facts concerning the key indicators and, broadly, whether and how changes in these indicators can be convincingly associated with the CS and INP activities of the Compact. Its analytic goal is to identify program impacts by estimating the marginal effects of different intervention levels (e.g., intensity of training or number and type of grants) on outcomes of interest, particularly household incomes as well as other, less tangible

benefits that may be easier to measure before the end of Compact. Considerable effort is dedicated to two aspects. The first is the design and construction of suitable indicators to measure appropriate intervention indicators (e.g., training intensity) and to capture the various qualitative effects of interest to MCA-N and MCC (e.g., sustainability). The second is to ensure "backdoor" channels of causality (endogeneity bias) are blocked during model estimation.

The evaluation also employs a mixed-methods approach in which qualitative techniques and quantitative analysis support each other, recognizing that the techniques used will depend on the evaluation question to be addressed. Such an approach is critical due to the inherently qualitative nature of the expected impacts as well as to guide and contextualize quantitative analysis. The qualitative analysis aims to provide local context as well as representative concrete examples that illustrate in greater detail the quantitative findings as well as provide credible arguments for (or against) those aspects of the research questions not amenable to statistical analysis or for which statistical analysis is inconclusive.

While MCA-N's ultimate focus is on longer-term outcomes, especially the economic well-being of conservancy members and INP harvesters, it is likely that the evaluation period is not long enough for these longer-term effects to manifest. We recognize that in the INP sector, for example, there are complex interactions among PPOs and supply chains involved in the realization of higher harvester household incomes, both in the short term and into the future. Hence, emphasis is placed on detecting intermediate outcomes as predicted by the program logic.

While the evaluation plan was under development, it was essential for baseline data to be gathered on households likely to be affected by the MCA-N activities with conservancies and PPOs. Under a separate contract, NORC implemented the Conservancy Support and Indigenous Natural Products Household and Organisational Survey (CS/INP Survey): the baseline data was collected in July 2011 and the endline round of data was collected in April/May 2014. The baseline and endline household surveys and monitoring data provided by implementing entities (service providers) provide the principal inputs to the quantitative analysis. In addition, NORC also collected qualitative data at two points in time: at midline in July/August 2013 and at endline in May 2014. A total of 80 Focus Group Discussions (FGDs) and 39 Key Informant Interviews (KIIs) were conducted which provide the principal inputs to the qualitative analysis.

Findings and Conclusions

The key findings of the CS evaluation are as follows:

Governance. Key governance constraints that were present prior to the MCA-N program include lack of accountability, insufficient information sharing, insufficient capacity, lack of member awareness of rights, and lack of respect for quorums at AGMs. Although there is strong consensus amongst conservancy management and conservation leaders that the governance training and technical assistance is a key strength of the MCA-N program, not all conservancy members agree that governance has improved, or that it is at an acceptable level. Most notably, while conservation leaders cite improvements in financial accounting and reporting, conservancy members express concerns around transparency and decision making.

Equitable distribution of conservancy benefits. Qualitative analyses did not find significant issues of equitability in the distribution of meat or cash benefits. Both qualitative and quanitative analyses find that the greater the number of members in a conservancy, the more equitable the distribution of in-kind benefits; the greater the geographic area of the conservancy, the less equitable the distribution of benefits. Trainings and technical assistance are associated with increased equality of the distribution of benefits. However, there continues to be a significant lack of transparency on conservancy income and how it is used. Results show that higher governance scores are associated with slightly increased inequality of the distribution of benefits within a conservancy, even after correcting for issues of endogeneity. Lack of 2009-2011 training data, as well as systemized data on the spending on public goods, may be driving this counterintuitive finding.

Employment. The number of JVs in a conservancy, along with the overall level of business activity in the conservancy, has a positive effect on full-time employment. The number of SMEs in a conservancy, however, seems to have little effect on employment. With available data, there is no detectable relationship between trainings/technical assistance and conservancy business. However, JV grants have been noted as a key strength of the CS program by addressing key barriers to private investment.

Distribution of benefits by gender. Benefits going to female-headed households increased over time. Female headed-households are experiencing relateively greater increases in expenditure and income than males due to benefits. Nonetheless, levels of expenditure and income for female-headed households still lags behind those of male-headed households. However, higher conservancy governance scores are associated with smaller shares of benefits distributed to female-headed households—a counter intuitive finding. The effect of training and technical assistance on the share of benefits to female-headed households is mixed.

Recipient-household gender relationships. Improved gender relationships often results from the improved economic situation of women and their ability to contribute revenue and food to the household. Women and men report that the trainings and other assistance from their service provider have helped them gain respect in their households. Quantitative analyses demonstrate that tourism employment leads to relatively higher increases in incomes and expenditures for female-headed households than male-headed households. Still, although significant progress has been made, many problems of tangible (e.g. income, employment) and intangible (e.g. representation of views in democratic forums) gender inequity persist.

Household well-being. Conservation leaders tend to emphasize gains in non-monetary aspects of well-being, including a greater sense of empowerment, increased control of land and resources, increased respect, and increased cultural values of wildlife. Conservancy members, however, emphasize monetary aspects of well-being, most prominently income, employment (including the sale of crafts), and food. While the average household has not seen major improvements in well-being from tourism and benefits distribution, female headed-households are seeing increases in expenditure and income attributable to employment and benefits. However, females still have a lower average income than males, all else equal.

Game acquisitions. Reintroductions have had multiple benefits for game viewing, tourism and hunting, and enhanced biodiversity/ecosystem conservation. These reintroductions seem to be working well for even the most highly endangered species. However, increased game populations bring in predators; while this is beneficial for trophy hunting, the presence of predators is not appreciated by conservancy members. The impact of common plains game species on crop damage may be underestimated.

Grants, technical support, and increased business partnerships. There is strong agreement that JV grants for lodges have been the core support for business partnerships and served as a key strength of program by addressing constraints to private investments through innovative and professional means. SME grants, however, have high transaction costs for modest benefits. Game translocation is expensive but results should be highly sustainable as long as conservancies remain viable. HWC grants could have benefitted from higher level of technical expertise.

Sustainability. Southern African CBNRM is unique in its dependence on the capacity of communities to negotiate and implement business partnerships. Conservancies will require ongoing support for the indefinite future, as tourism partnerships are complex. While trophy hunting is on a rapid decline in Africa, many think Namibia and South Africa will outlast others. The timeline for when conservancies would be able to foster and manage these partnerships with minimal support is not yet clear. Other threats to sustainability of conservancies include: maintenance of adequate levels of good governance, demographic growth, human wildlife conflict, economic downturns, and risks linked to government programs.

The key findings of the INP evaluation are as follows:

Application of training. Of the households that participated in training, almost 100% said they applied what they learned. The qualitative data confirmed that the majority of harvesters found the trainings useful and applied what they learned in trainings.

Determinants of training take-up. While female-headed households were less likely to attend training at baseline, this correlation vanished at endline, suggesting that eventually there was no gender bias in training take-up. On the other hand, there is a positive correlation between education level and training participation, which may have implications in terms of inequality, as abler individuals may have been the ones that benefited the most from training.

Effect of training on harvested quantities. We find a positive and significant effect of training only for Marula. We did not find significant effects of training on harvested quantities for Devil's Claw or Ximenia. The null effect found for Ximenia may be a consequence of the drought observed in 2013. Although any change that affected all the harvesters is controlled in our specification through year fixed effects, any shock devastating enough will impede any program to have an effect, even if such a program would had a positive effect in the absence of the shock.

Effect of training on INP quality. FGD participants strongly indicated that the trainings had an effect on the quality of INPs. It improved the harvesting practices for Devil's Claw and Marula. Trainings also increased the quality of post-harvesting practices.

Effect of training on revenue and other financial constructs. Not surprisingly, we found positive effects of training on INP-related revenue only for Marula. Although the coefficients were positive for household total revenue and income (for Marula), the standard errors were large and no significant effect was found for these variables. For Devil's Claw and Ximenia we did not find any effects. The perception from FGD participants is that the trainings contributed to increase their income.

Gender. As Marula harvesters are females and there was an effect of training on Marula, it was to be expected that training affected positively the revenue of females for Marula households, which was corroborated by the data analysis. Qualitative data suggest that trainings have had an effect on women as they became more empowered and their role as income earners elevated their status in the household. However, there is also a sense that despite this, men still remain the heads of households and decide what to do with the money.

Market Bulletin. The original market informational tool was ill-conceived and replaced with a market bulletin. Key informants felt that the market bulletin did not have a strong impact on the sector and it will likely disappear after the end of the Compact.

IPTT. The IPTT is seen as an important platform and the re-organization that it underwent during the Compact duration was welcome. However, the future of the IPTT is not yet clear, so a vision for the IPP in years to come needs to be well-defined.

Innovation Fund. The innovation fund funded some promising projects but unfortunately there was not enough time to implement many of the results that came out of the projects.

Sustainability of the sector. Many PPOs are still dependent on implementing entity support and will need continuous training especially due to management staff turnover. Overall there is also a sense that the project did not focus sufficiently on the demand side of the supply chain and that is a threat to the sustainability of the INP sector as a whole.

Limitations

The main limitations of the CS evaluation are as follows:

In the quantitative analyses, methodological and data limitations include too few observations, especially with regards to the monitoring data. Most analyses required 2013 data, and CDSS did not release its latest data until September 2014. Where data was available, especially in 2010/2011, the data tended to suffer from measurement error. Some data that NORC thought would be available when it was planning the design of the evaluation was not available after all, or did not produce any conclusive findings. The lack of available data limited options for the model to control for other factors that may have systematically affected outcomes (issues of endogeneity). It is also important to note that the evaluation period was short, and in some cases the program (treatment) was not in place long enough to pick up any effects.

In the qualitative analyses, KIIs were unable to be arranged with any key informants from the Ministry of Environment during either 2013 or 2014 field visits. Finally, there was also difficulty recruiting FGD moderators with local language skills and expertise in community-based wildlife management.

The main limitations of the INP evaluation are as follows:

Quantitative sample: It is important to keep in mind that the quantitative sample is not representative of all PPOs that were included in the INP Activity. The household survey sample was drawn from a sample frame comprised of 2009 PPO membership lists, and in the end only 18 PPOs figure in the household panel (although more than 18 PPOs were represented in the sample drawn), out of more than 60 PPOs that benefitted from the intervention. Therefore the quantitative results presented in this report are only representative of the 18 PPOs represented in the sample.

Counting training sessions: Our covariate of interest (the treament variable) is number of training sessions, which was counted as the number of sessions in the twelve months prior to data collection (at both baseline and endline). This implies that trainings that occurred between mid-2011 and mid-2013 are not counted. This constitutes a measurement error problem that may be biasing our results. This is particularly problematic if we consider the possibility that, as it was our understating before analyzing the endline data, all or most households participated in training at some point. However, our variable for treatment (trainings in twelve months prior) constitutes a good proxy (although, perhaps, deflated) for the actual number of trainings if the households that participated in more training sessions 12 months before data collection were also more likely to participate in training between mid-2011 and mid-2013. The fact that we found a positive correlation between counted baseline and endline trainings suggests this is the case.

Selection into treatment: Selection into training sessions was driven by a joint selection process. On one hand treatment was offered and on the other households members participated. This implies that selection into treatment was determined by factors stemming from both processes, "confounding" factors which could also be correlated with the outcomes of interest. This could bias the causal effect of training. Our identification strategy relied on the use of household fixed effects and propensity scores. The assumptions needed for these strategies to mitigate any such biases are that these factors that may confound the treatment effect are either time-invariant (and can be controlled with fixed effects), or can be observed (and included in the propensity scores).

Attrition: A small fraction of households surveyed at baseline were not surveyed at endline. This constitutes an attrition problem that may be biasing our results. Although the data suggested that there were some differences between households that stayed in the sample and households that did not, assuming that this selection process was driven by time invariant characteristics, attrition is controlled for in our household fixed effects models.

For both evaluations, it is important to keep in mind that the FGDs only covered 12 PPOs at midline, of which 8 were re-selected for the endline; and 12 conservancies at midline, of which 8 were re-selected for the endline. For example, for Ximenia, only one PPO was interviewed. It may therefore be difficult to generalize the qualitative findings to the entire INP harvester and conservancy population.

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I. INTRODUCTION

The Millennium Challenge Corporation's (MCC) Compact with the Republic of Namibia aims to reduce poverty through economic growth fostered by investment in the Education, Tourism and Agriculture sectors. The Millennium Challenge Account Namibia (MCA-N) was established to design and implement activities in these three areas to achieve its anti-poverty objective. As part of the Tourism component of the Compact, the Conservancy Support (CS) Activity is developing the capacity of 31 communal conservancies in the Northern Communal Areas (NCAs) to attract investments in ecotourism and capture a greater share of tourism-generated revenue in Namibia. As part of the Agricultural component of the Compact, the Indigenous Natural Products (INP) Activity is assisting Producer and Processor Organisations (PPOs) to improve their product volume, quality, increase their value-added products, and improve organisational and business capacity. In addition, the INP activity is enhancing the INP Sector through an Innovation Fund and a Market Bulletin.

MCA-N has contracted NORC at the University of Chicago (NORC) to undertake an evaluation of the CS and INP Activities. Broadly, the purpose of the evaluation is to shed light on the consequences of providing PPO and conservancy members with technical training and grants to improve productivity and association management with governance capacity building, value-chain strengthening, and investment facilitation. The program logic predicts that these interventions should increase the sustainability of economic activities and social empowerment and thereby raise household wellbeing. To make this evaluation most useful, we combine rigorous quantitative methods with comprehensive, qualitative interpretation so as to gear findings towards drawing concrete implementable lessons for future programming and building of sustainability in the sectors under study. The evaluation framework is that, aside from exogenous events, the outcomes of the interventions are the result of both the project design as defined in the Terms of Reference developed by MCA-N as well as the result of implementer effectiveness.

Both CS and INP activities involve a range of interventions and programmatic initiatives. There is significant overlap between INP harvesters and conservancy members and for this reason it would have been preferable for the two programs to be evaluated simultaneously using a multi-dimensional experimental design. Unfortunately, limitations in sample size make this approach infeasible. Instead, the two activities are evaluated in parallel.

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II. METHODOLOGY

1. General description of methodology and research questions

A major challenge facing a rigorous evaluation of the CS and INP Activities is that both Activities are provided to all observational units (conservancies and PPOs) that met the Compact conditions. The CS activity is taking place in most of the conservancies of the NCAs, which were selected for their tourism potential. Conservancies outside of this activity are generally in areas with differing natural endowments and market access and, as such, cannot serve as a comparable set of non-intervention conservancies. In the case of the INP sub-activities, it is not feasible to establish a valid comparison group because the intervention covers nearly the entire INP producer population. Since these conditions are very much correlated to expected performance (and, therefore, impact), other similar units almost by definition are *not* suitable as a counterfactual comparison group. Hence, control groups are not available for the evaluation of either the CS activity or INP sub-activities and neither experimental nor quasi-experimental design approaches are permissible in the present case. As such, MCA-N requested that rather than have qualitative input augment and confront statistical attributions, the approach should endeavor to assess key aspects of project performance through a series of qualitative methods—Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs)—whose insights will be balanced with model-based quantitative analysis.

The CS/INP evaluation is designed to assess a number of evaluation hypotheses. Some of these hypotheses are better answered through qualitative methods while others through quantitative methods or a mix of both. The qualitative analysis aims to provide local context as well as representative concrete examples that illustrate in greater detail the quantitative findings about likely causal links between activity inputs and households, on the one hand, and activity inputs and conservancy- or PPO-level outcomes, on the other. It is also expected to provide credible arguments for (or against) those aspects of the research questions not amenable to statistical analysis or for which statistical analysis is inconclusive. Such an approach is critical due to the inherently qualitative nature of the expected impacts as well as to guide and contextualize quantitative analysis. The idea of the qualitative data collection is to ask stakeholders about their situation, experiences, views on changes they have observed over the intervention period, and what they believe the causes for those changes were. Topics of interest include experience and satisfaction with the services provided under the intervention, as well as perceived impacts on (i) household well-being and gender relations, (ii) flora and fauna sustainability, and (iii) the role and relevance of the member organisation.

As for the quantitative analysis, a type of a reflexive (before-and-after) design called a dose-response model is employed whereby each conservancy or PPO at baseline contributes to our understanding of the counterfactual by allowing us to infer whether differences in the amount of Compact assistance (the "dosage") influence—and, therefore, impact —CS or INP performance. The model identifies likely program impacts by estimating the marginal effects of different intervention levels (e.g., intensity of training or number and type of grants) on outputs and outcomes of interest at critical points along the causal chain from the short to medium run. Originally, program impact on household income, the ultimate

expected result by MCA-N, was to be a focus of examination, but it is now accepted that such changes would not likely be large enough to be detected over the relatively short evaluation period.

Central to the credibility of findings from a model-based evaluation is that the assumptions underlying the model are acceptable and that all reasonable confounders have been considered. We address these by testing the robustness of the approach in several ways. First, alternative models are estimated using different indicators of outcomes and/or treatment (dose), each representing a slightly different channel of impact according to theory. Second, for each channel modeled, several different yet reasonable model specifications are tested. These alternative specifications focus on using additional variables to block (capture) "backdoor" paths of reverse causation. In both cases, agreement across models that the hypotheses of attribution cannot be statistically rejected underscores robustness of findings and strengthens their credibility.

The following tables lists the CS and INP related research questions that MCA-N provided as well as the method of inquiry.

Table 1. CS Evaluation Questions

#	CS Evaluation Questions	Method
1	Do technical support and grants to conservancies increase business partnerships between conservancies and private businesses, and, in turn, increase conservancy revenue?(a)	Qualitative
2	a. Does technical support to conservancies improve conservancy governance? b. Does improved governance impact the equitable distribution of conservancy benefits?	Qualitative & quantitative
3	a. Is there an increase in conservancy-related employment as a result of the CS activities (including grants)? b. If so, how many new jobs are created and at what levels of employment?	Quantitative
4	Do the CS activities (including grants) lead to an increase in household wellbeing over the life of its programme?(b)	Qualitative & quantitative
5	What have been the effects of game acquisitions on the conservancies and on their members?	Qualitative
6	How sustainable are the results of business partnerships in terms of increased employment and improved mechanisms for distribution of revenue?	Qualitative
7	What impact does MCA-N support have on conservancy members in terms of the distribution of benefits by gender?(b)	Qualitative & quantitative
8	What is the perceived impact on recipient-household gender relationships from the intervention?	Qualitative

(a) Total annual gross revenue to conservancies receiving MCA-N assistance from all sources except donors and government. Includes revenue to conservancies from (1) cash income to conservancy, (2) household income from conservancy-related wage, salary, or sale of crafts, and (3) non-financial income such as meat or in-kind services such as training or housing for lodge staff. (b) MCA-N program logic indicates that impacts on household income may not be detectable within the lifetime of the compact; however, intangible benefits (e.g., aspects of women's empowerment, increase in rural-urban economic integration) measurable in the short term may be detectable through FGDs.

Table 2. INP Evaluation Questions

#	INP Evaluation Questions	Method
1	Do the technical assistance package and the small grants increase the quantity and quality harvested and/or processed by recipients?[(a)]	Qualitative and quantitative
2	To what extent has the Delivery of Market Information Sub-Activity contributed to increased understanding of the broader INP sector (e.g., volumes, markets, key players, etc.)?	Qualitative
3	What is the uptake rate and effect of the practices and techniques introduced as part of the technical assistance on recipient harvesters?	Qualitative and quantitative
4	For the PPO did the technical assistance improve organisational capacity to manage the business and income/revenue?	Qualitative
5	How sustainable are the results in terms of increased production, sales and income? E.g., market chain (are there long-term buyer contracts in place, are the institutions functional and independent).	Qualitative
6	How has the re-organisation of the Indigenous Plant Task Team contributed to the growth and sustainability of the INP sector?	Qualitative
7	How did new developments from the INP Innovation Fund impact on the INP sector?	Qualitative
8	Did the composition and level of household incomes change (more income sources, more diversification, and higher income)?	Quantitative
9	What changes are apparent in intra-household incomes and assets, including specifically around income earned by male and female household members? Does the intra-household distribution of income and employment by male and female household members change?	Qualitative
10	Did household assets change (houses, bicycles, radios, television sets, telephones, etc.)?	Quantitative
11	Did the composition of household financial assets change (savings, debt, borrowing, insurance)?	Quantitative
12	What is the perceived impact on household gender relationships from the intervention among recipients?	Qualitative
13	What is the combined effect of being part of a conservancy and PPO member among women?	Both qualitative and quantitative

2. Data sources

Below we present the list of all data sources used for both the CS and INP evaluations. More specifics regarding each type of data is presented in section III for the CS evaluation and section four for the INP evaluation.

Qualitative data were collected in two rounds, midline (in July-August 2013) and endline (in May 2014). Qualitative data consisted of:

- **Focus Group Discussions .** A total of 80 FGDs were conducted over the two rounds. Half of the FGDs were conducted with management members of PPOs and conservancies while the other half were conducted with non-management members. The sample is by no means statistically representative in the way that a quantitative survey is. However, NORC still attempted to get representation from a diverse group of conservancies and PPOs in order to capture different experiences and perspectives that might vary based on language, geographic location, plant/wildlife species, and other conservancy/PPO characteristics.
- **Key Informant Interviews.** NORC sector experts conducted a total of 39 KIIs over the two rounds: 20 CS KIIs and 19 INP KIIs. The KIIs covered the following categories of respondents: (i) Implementing partner (management informants that are directly involved in the implementation of the project), (ii) Private sector (entrepreneur informants that are affiliated with the INP or conservancy sector but not instrumental to project implementation), (iii) Public sector (government informants who are working with a department whose mandate covers the INP or CS sector) and (iv) for CS, conservation leaders (thought leaders in the conservancy support movement).

Quantitative data for estimating pre-test/post-test changes in impact variables are derived from three primary sources:

- **Household surveys**. Two rounds of the CS survey and the INP survey, which were explicitly designed for the evaluation, were administered to the same group of 300 INP harvester-households and 1,000 CS members in 2011 (baseline) and 2014 (endline).[2] To compensate for INP harvesters not accessible at baseline, an additional 200 were interviewed at endline, bringing the endline total to 500. Data from these surveys provided information on important measures of impact, as well as on household characteristics and demographics.[3]
- **Implementer databases**. For the CS activity these included the NACSO (Namibian Association of Community-Based Natural Resource Management (CBNRM) Support Organisations) database, which has annual information on key economic indicators of interest such as revenues at the conservancy level and the shares of conservancy revenue paid out in dividends. Implementer data also included conservancy-level Geographic Information System (GIS) data and game counts available through internal databases from the Conservancy Development Support Ser-

[2] See "Baseline Data Quality and Analysis Report", NORC, 21 September 2012, for a summary of the dataset. Originally, the INP harvester sample was set at 500 but weather conditions prevented access to several PPOs. The endline however, used replacements to achieve the original 500-harvester target.

[3] Please see Annex A for more details on the sample design.

vices (CDSS) NACSO, and the Conservancy Development Grants Fund. Separately, there was data on the size of grants and the geographic distribution of services and grants. For the INP activity this data came from the Natural Resources Institute (NRI), University of Greenwich's program monitoring outputs.

- **Implementer reports**. These included "Quarterly Progress Reports" from NRI on their implementation activities. Implementer reports also included fund grantee monitoring and reporting data related to the PPO Primary Production Improvement Grants (PPIG), andsimilar data related to the Innovation Fund managed through MCA-N. Likewise, NORC received quarterly and annual reports on CDSS, augmented by annual "State of Conservancy" reports. While these reports were rich sources of institutional detail (qualitative data) they also contained many tables and annexes of numeric and categorical data.

3. Other considerations

In interpreting the material that follows note that:

- All tables in the report are population-weighted unless otherwise stated.
- Where possible we note when estimates are unlikely to be reliable due to a small sub-sample
- 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.

Lastly, for the sake of logic, we have modified the order in which research questions are presented. We indicate the original number of the research question in parenthesis, e.g. "(RQ1)".

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III. THE CONSERVANCY SUPPORT EVALUATION

1. Activity Overview

Over the last 15 years, CBNRM has been an effective mechanism for the Government of Namibia to combine conservation with developing governance structures to enhance the wildlife resources needed to attract tourism to rural communal areas of Namibia. To encourage sustainable management of natural resources, the Namibian Government passed a law in 1996 that gave communities in communal areas the legal right to form a management unit, called a *conservancy,* in order to obtain management rights over wildlife.[4] More specifically, conservancies are areas on communal land for which legally constituted conservancy communities have been empowered by government with the rights to manage and benefit from consumptive and non-consumptive use of wildlife and other natural resources within defined boundaries.

Currently there are 76 registered conservancies covering 155,205 square kilometres (15 percent of Namibia's surface) and encompassing almost 234,400 citizens or almost 13 percent of the national population. Results of the conservancy movement have included increased wildlife populations on conservancy lands, devolution of authority over land-use management to rural communities, generation of employment in tourism enterprises, and generation of financial benefits for conservancy members.[5]

The MCA-N CS Activity aims to strengthen capacity of conservancies to protect and manage their natural resources, attract investment, and achieve financial sustainability so that households in communal conservancy areas can receive a greater share of increased revenues. Based on individual conservancy needs and demands, the CS Activity is providing a range of *technical assistance* services and *grant funding* to 31 conservancies considered likely destinations for tourism. The 31 selected conservancies include the majority of Namibia's most progressive and financially viable communal conservancies.[6] Of these, 29 are existing conservancies and two are newly established. On the advice of MCA-N and the implementation contractor, only the 29 well established conservancies are included in the evaluation.[7] While results in the immediate term may differ because these two conservancies received treatments one to two years after the other 29 conservancies, it is likely that in the longer term outcomes likely do not differ.

A major constraining factor in incorporating these conservancies in the analysis is the availability of data—both in the available monitoring data collected by CDSS and NACSO, as well as in the NORC household survey.

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4. As defined under the Nature Conservation Amendment Act, 1996 (Act N. 5, 1996)
5. These two paragraphs are slightly edited versions of those in the RFP for the evaluation project issued by MCA-N.
6. World Wildlife Fund, Data Collection Plan for the Conservancy Development Support Services (CDSS) Project, March 2011, p.7.
7. Two conservancies were excluded since they were not gazetted at the time.

The CS Activity is being implemented by a consortium of organisations led by the World Wildlife Fund under the CDSS umbrella. Four additional implementing partners, each with very extensive experience in the specific region in which they operate, deliver services:

- Integrated Rural Development and Nature Conservation (IRDNC)
- Namibia Development Trust
- Namibia Nature Foundation (NNF)
- Nyae Nyae Development Foundation of Namibia (NNDFN)

A comprehensive management-needs assessment was conducted for conservancies selected for program participation in 2009-2010. The implementation team then designed a set of training courses and technical assistance activities for each conservancy based on an analysis of the needs assessment and further internal review. Complementing the training and technical assistance are grant resources under the Conservancy Development Support Grants Fund targeted to promoting joint-venture tourism enterprises (JVs) between conservancies and private sector firms, mitigating human-wildlife conflict, supporting game acquisition through translocations, and other income generating activities. Grants are being awarded on a competitive basis. A conservancy can receive only one JV grant; a total of 15 conservancies received grants..

The package of technical assistance and funding is designed to help mitigate existing barriers to tourism enterprise investment and help render conservancies financially self-sustainable. This in turn is intended to raise the incomes of households living in conservancies.

CS Program Logic. For the CS component, the intervention began with the Associates in Rural Development, Inc. (ARD) baseline conservancy institutional needs assessment. Although not without its own measurement issues, the baseline assessment provided CDSS with a starting point to help focus their capacity-building interventions.[8] This assessment was supplemented by an additional CDSS needs assessment which further refined which interventions would be offered to which conservancies. Importantly, each conservancy started with a different mix of capacities and levels of institutional development. Intervention modules were thus rolled out using a methodology that targeted the specific needs of particular conservancies.

CS interventions, unlike INP interventions, are focused entirely at the institutional level of the conservancy. The logic is predicated upon the hypothesis that the stronger the institutional capacity of conservancy management structures the more likely conservancies will grow and the resulting increased revenue/benefits will filter down to the household level. Hence, CDSS program logic does not assume a

[8] The ARD baseline assessment has been criticized by local experts as having a problematic methodology that relied too much on subjective criteria. In addition, each conservancy may not have been rated based on a strong understanding of where they stood in relation to other conservancies.

direct causal relationship between funding, assistance, and training, on the one hand, and household standard-of-living indicators, on the other. Rather, the logic of the intervention suggests increased conservancy capacity will lead to conservancy-level outcomes (JV lodge development, Small-Medium Enterprise (SME) growth, tourism growth) and these outcomes will, in turn, impact household indicators.

CDSS provided trainings and technical assistance across three major categories: Institutional, Business and Tourism Enterprise, and Natural Resource Management. A list of training and technical assistance topics is provided below. As of the end of 2013, a total of 28 training modules had been developed, and 305 training events delivered across all conservancies[9].

Table 3: Training and Technical Assistance Topics.

Institutional Training
Governance- Constitution Development Revision
Annual General Meeting Management
Management Committee Training
Stakeholder Communication and Relationship Management
Gender Awareness Training
Public Speaking and Presenting
Policy Legislation
Financial Management
Distribution planning and benefit sharing
Conservancy Framework/ Management Plan Development
Staff Management
Project Management
Business and Tourism Enterprise Training
Basic Business
Tourism Awareness - Committee
Tourism Awareness - General
Tourism JV Development
Tourism Enterprises and Products
Tour Guiding
Natural Resource Management Training
Event Book System
Game Count
Game Value
Quota Setting

[9] *CDSS Final Report*, 2013.

Game Utilisation
HWC Management
Management planning & zoning
Wildlife biology/behaviour
Law enforcement
Natural Resource Management Training (continued)
NRM
Institutional Technical Assistance
Governance
Financial Management
Management Plan
Staff Management
Business and Tourism Technical Assistance
Basic Business
Financial Sustainability
Tourism JV Development
Legal TA
Tourism SME Product Development
Business Study Tour and In Service Training
JV Exposure Trips
Lodge Placements
Natural Resource Management Technical Assistance
Event Book System
Management Planning and Zoning
NRM Rules and Regulations
HWC Mitigation

Source: CDSS Monitoring Database (TA days per quarter)

In general, CDSS states that trainings were provided to conservancy management based on several factors, including relevance, need, and the availability of training material content.[10] There were a number of complex criteria that went into which conservancy received a particular number and mix of trainings. For example, in the case of Business and Tourism trainings, a mix was provided based on the findings from a needs assessment, the willingness of enterprises within the conservancy to commit time and attention to trainings, CDSS's determination of "what works and what doesn't", and linkages with identified MCA-N grant opportunities.[11]

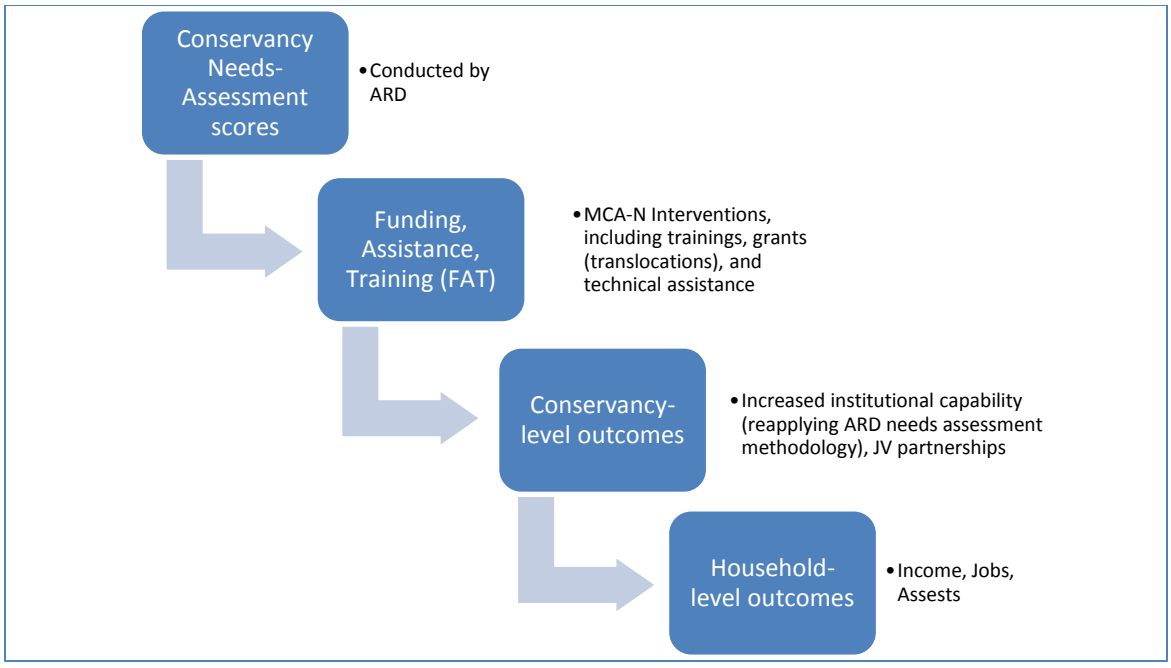
[10] p. 28, CDSS Inception Report, 2010. http://www.mcanamibia.org/files/files/CDSS%20Inception%20Report.pdf
[11] p. 39, *Ibid*.

This could mean that the link between trainings and outcomes may have been affected by aptitudes: for example, if a particular conservancy showed promise in managing JV partnerships, CDSS may have been more likely to provide a training on managing JVs to the conservancy. More remedial conservancies may have been less likely to receive that training.

Training content was developed by various in-field experts, but was standardized by CDSS's central office. Trainers were from central offices as well as CDSS field implementing organizations; while this may indicate some regional variation in the quality and content of training, CDSS made attempts to standardize the type of training provided to conservancies by developing standard materials, as well as providing train the trainer sessions.[12]

Given the underlying logic of the interventions (institutional capacity building → institutional outcomes → household-level change), it is conceivable that there will not be measurable impacts at the household level before the Compact ends. Several studies suggest that one or two years is too short a time period for the very small changes anticipated in income growth to have a detectable effect. As such, it was important for the evaluation to consider additional, measurable, mid-term benefits (e.g., job creation).

Figure 1: Schematic of the CDSS program logic



[12] p. 29, *Ibid*.

2. Methodology

Useful techniques are available to address threats to validity associated with the lack of a comparison group. A powerful technique applicable in this situation is to use a model-based approach to analyze the survey data, rather than the usual design-based approach.

The design-based approach is the traditional approach used for experimental and quasi-experimental impact evaluation. Under these approaches, participation in the intervention is randomly assigned by the evaluator (in the case of experiments) or is self-selected by the beneficiary (in the case of quasi-experiments). In the design-based approach, descriptive surveys, which are typically used for monitoring, form the basis of data collection. The survey data are randomly drawn from separate yet comparable groups of observational units (e.g., conservancy- or PPO-member households) in the population—those targeted to receive the intervention and those not chosen to receive it (in the case of experiments) or do not choose to take up participation in the intervention (in the case of quasi-experiments). A statistical comparison of these groups is then made to draw inferences about overall characteristics of the particular finite population at hand and, often, alternative sub-populations (e.g., income quartiles, head-of-household gender, member households with more than five children) from it, accounting for the probabilities of selection of each observational unit selected. (Examples of additional characteristics are total crop production, new harvesting techniques employed, sales, household income, meetings attended.) These design-based estimates lead to unbiased measures of the characteristics in the population being surveyed under the right conditions and with respect to the appropriate sample, conditioned on the particular design approach. Importantly, the simple set-up of the approach is typically viewed as relatively free of assumptions and ideology and so yields results that are more readily accepted than other approaches, though sometimes at the cost of generalizability.[13]

In the model-based approach, a theoretical causal model is specified to describe the relationship postulated between the outcomes of interest (a.k.a. intervention response variables, explained variables, dependent variables) and those characteristics a.k.a.believed to influence them (explanatory variables). These influential characteristics would include both program intervention variables and other "explanatory" variables (covariates) that may influence outcomes. This relationship is then specified by one or more equations (the "model") and its parameters are then estimated statistically using (in the present case) the survey data collected for this purpose, as well as data made available from other sources at the level of the PPOs and conservancies. In this approach the particular finite population at hand is considered to be a sample from a conceptually infinite process, in which the program intervention plays a role. The conceptual framework is that we are making inferences about the process, not the particular finite population. If the underlying theoretical causal model that describes the relationship of the outcome variables to the program intervention variables and other explanatory variables is correct and

[13]The notion of generalizability in impact evaluation is referred to as external validity.

the econometric model is correctly specified and estimated, then unbiased estimates of parameters of interest can be obtained.[14]

Under this approach and in contrast to the design approach, the existence of the theoretical model offers both pluses and minuses. On the plus side, it is often more accepted to make generalisations and "out-of-sample" predictions (i.e., statements about other samples from the same population but with different characteristics) from an empirically estimated theoretical model. A model also increases the statistical precision for a given sample size (or, equivalently, reduces the required sample size to achieve a given level of precision). On the minus side, since the correctness of the population estimates are contingent on the theoretical model and its mathematical specification and estimation, the inferred (within-sample) findings are often more susceptible to doubt. The practical difficulty rests in determining a correct specification of the model. This is accomplished through careful application of causal model analysis (and, in particular, directed acyclical graph or "DAG" analysis), whose goal is to obtain estimates that avoid endogeneity and omitted-variable issues and are, therefore, "model-unbiased," instead of "design-unbiased."

Though the CS activities do not allow for a comparison group, the goals and objectives of the present evaluation can and should be met by a model whose parameters are estimated from data that come from a one-group pretest-posttest survey design. This is done by constructing the survey design in such a way as to assure good variation (high spread) within and low correlation among the explanatory variables of the program outcome model. At the same time the sample should ideally include observational units with a good variation in their degree of exposure to the MCA-N's intervention. Sample design techniques for accomplishing this were stratification, matching, two-stage sampling, and selection of first-stage sampling units (primary sampling units) with variable probabilities. A baseline survey was administered (July 2011) to households in the intervention areas before the (MCA-N-funded) interventions and an endline was conducted afterwards (April-May 2014), forming a panel dataset.

The models we use for both the conservancy and INP components represent changes in outcome variables of interest (the "dependent" variables) as a function (indicated by an *f*) of explanatory variables which in turn are divided into treatment variables (program intervention variables) and other covariates (e.g., size of household or level of head-of-household educational attainment):

Impact = Change in outcome measure = *f*(Explanatory variables, changes in explanatory variables).

Referred to as continuous treatment-variable model, these models are of the form, $\Delta Y = f(\boldsymbol{X}; \boldsymbol{\Delta X})$, where ΔY is the change in any indicator, $\boldsymbol{X}$ represents the analyst's choice of any combination of the intervention activities and covariates, and $\boldsymbol{\Delta X}$ is the change in $\boldsymbol{X}$ over the evaluation period. The model can be

[14] In particular, no salient causal factors have been omitted, interaction and inter-temporal (lagged) effects are taken into account, endogeneity and simultaneity among variables is properly specified, and the functional relationship (e.g., linearities and non-linearities) among endogenous and exogenous variables is approximately correct.

applied equally well at the level of organization (conservancy or PPO) and household. We estimate these models using alternative type of regression analysis. Examples are provided in the next section.

To deal with potential selection bias or endogeneity, some CS analyses rely on specifications that include covariates estimated in a prior first-stage regression. We realize that, ideally, in this context the standard errors should be bootstrapped. There were a variety of reasons why this was not done. Among these were that some analyses involved small sample sizes in which case we opted to use robust standard error estimation clustered at the conservancy level. Second, we needed to apply sampling weights and our software (Stata) does not permit mixing weights with bootstrapping. We did run some tests where feasible and found that the differences between the two approaches were very small. In sum, we are confident that statistical inference should not be affected by this statistical compromise. In any case, for each regression result we specify the type of standard error that was calculated.

3. Data Sources

Focus Group Discussions. A total of 40 FGDs were conducted with conservancies. For the midline data collection, 12 conservancies were selected to cover a wide range of conservancy characteristics such as geographic location, size, population and institutional level. For each conservancy, two focus groups were conducted: one with the members of the management staff and one with members who did not hold a management position with the conservancy, bringing the total of midline CS FGDs to 24. For the endline data collection, 8 of the original 12 conservancies were re-selected[15] and similar to midline, FGDs were conducted with management and non-management members, bringing the total of endline CS FGDs to 16.

[15] NORC's contract stipulated that 8 CS FGDs be conducted for the endline. The conservancies were selected so as to retain variability in conservancy characteristics.

Table 4. Conservancies sampled for FGDs

Name	Region	Area (km^2)[e]	Pop.[e]	Level[b]	Poten-tial [c]	Spending power (N$)[d]	Sampled at midline	Sampled at endline
Marienfluss	Kunene N	3,034	300	M	2	5,429	X	X
Doro !Nawas	Kunene S	3,978	1,500	B	3	10,532	X	
Uibasen	Kunene S	286	230	A	2	19,185	X	X
Omatendeka	Kunene N	1,619	2,500	M	2	11,631	X	X
Sikunga	Caprivi	287	2,000	B	3	9,137	X	
Mayuni	Caprivi	151	2,400	A	2	7,661	X	
Kwandu	Caprivi	190	4,300	A	3	7,018	X	
Salambala	Caprivi	930	7,700	A	3	11,023	X	X
Muduva Nyangana	Kavango	615	2,000	B	3	13,286	X	X
Nyae Nyae	Otzondjupa	8,992	2,300	A	2	6,385	X	X
King Nehale	Oshikoto	508	20,000	B	3	13,537	X	X
Uukwaluudhi	Omusati	1,437	25,000	B	1	13,315	X	X

Source: *Namibia's Communal Conservancies: A Review of Progress and Challenges in 2011, NACSO, pg.106-107.*

Notes: (a) JV=Joint Venture, SME=Small-Medium Enterprise, HWC=Human-Wildlife Conflict. Grants are included if they are either probable, likely, or being implemented. Bold indicates a grant that is currently being implemented. (b) Institutional level: B=Beginning, M=Medium, A=Advanced (c) 1="Just started", 2="Developing", 3="Sustainable", as assessed by ARD. (d) Average of total annual household income and expenditure as revealed by NORC baseline household survey.

There was one change in the 2014 selection of participants for the FGD for non-management. In 2013, many of the FGD included game guards who are employees of the conservancies. For 2014, game guards were not included. The reason for doing this was to get participants who are more representative of the average members of a conservancy. Conservancy employees almost certainly have a higher level of knowledge about conservancy activities and may have a vested interest in giving a positive view of the management structure that employs them.

Key Informant Interviews. A total of 20 CS KIIs were conducted, 8 during the midline round and 12 during the endline round. Table 5 below gives the breakdown by type of respondent.

Table 5. Conservancy KII Respondents

Key Informant Category	Number of KIIs Midline	Number of KIIs Endline
Implementing Entity and Conservation Leader	1	1
Implementing Entity	4	3
Conservation Leader	1	1
Private Sector Partner	2	5
MCA Namibia	0	2
Total	**8**	**12**

Household Survey. The CS survey data consists of a panel sample of approximately 1,000 interviews. At baseline, 1,032 households were interviewed, and at endline 1024 households were interviewed, of which 783 are panel households. The baseline sampling was based on an in-field sampling methodology

in which 102 Enumeration Areas (EAs) overlapping with conservancy boundaries were selected out of a list of 300 EAs, and 12 households within each EA were randomly sampled.[16] The sample covered a total of 28 conservancies.[17]

Implementer Database/Monitoring data (CDSS/NACSO data). In addition to the household survey data, the evaluation team used monitoring data which include the NACSO CBNRM database, which has annual information on key economic indicators of interest such as revenues at conservancy level and share of conservancy revenue paid out in dividends, as well as conservancy-level GIS data and game counts available through internal databases for CDSS,NACSO, and the Conservancy Development Grants Fund. There was also data on the size of grants and the geographic distribution of services and grants. Below is a list of variables used in the CS analysis, as well as their data sources and years of availability.[18]

Table 6: Availability of Data Items Used in CS Analysis.

Data Item	Data source	Date of availability
Annual Gross Revenue, Total Income, Conservancy Income, Household Income, Other income	2013 CDSS Annual Report	2010-2013
Full-Time and Part-Time tourism employment	2013 CDSS Annual Report	2010-2013
Tourism jobs generated	High Level Indicators Spreadsheet from CDSS	2010, 2013
# of Operational JVs	2013 CDSS Annual Report CONINFO list of JV agreements CDSGF Grant Database MCA-N consultation	2010-2013
# of CDSGF JV grants	CDSGF Grant Database	2012-2014
# of CDSGF SME grants	CDSGF Grant Database	2012-2014
# of SMEs operational	CDSS Governance data	2010-2014
CDSS Trainings, by topic	Training Delivery Summary (as of 18 March 2014)	2011-2013
Registered Members	CONINFO database	2012
# of game animals translocated	CONINFO database; MCA-N 2013 Translocation Report	2009-2014
Days of technical assistance (by topic)	TA days per quarter (as of 31 Dec 2013)	2011-2013
Benefits (cash and in kind), Meat Value, and Total Benefits (Cash, In kind, meat)	2013 CDSS Annual Report	2010-2013

[16] Please see Annex A for more details on the sample design.

[17] Impalila Conservancy could not be included as the only way to access it is through Botswana.

[18] The evaluation design report included a list of data items to be included in the analysis after consultation with CDSS at baseline. However, not all of these data turned out to be available, or were not available consistently for baseline and endline. Annex B includes a list of these data.

Data Item	Data source	Date of availability
CDSS Governance Performance Rating	2013 CDSS Annual Report	2010-2013
CDSS Financial Management Performance Rating	2013 CDSS Annual Report CDSS Governance Data	2010-2013 2010-2014
CDSS AGM (Annual Gen Mtg) Performance Rating	2013 CDSS Annual Report CDSS Governance Data	2010-2013 2010-2014
ARD Governance Rating	2009 ARD Diagnostic Report	2009
Age of Conservancy	CONFINO database	-

While the household survey includes 28 conservancies, analyses from the monitoring data include two additional conservancies: Impalia and Kasika (which started receiving CDSS support after 2011). Support to Iipumbu ya Tshilongo also began later (as it is a relatively new conservancy); due to this, not much data on these additional conservancies is available in the 2013 CDSS Annual Report and other data sources. Due to low availabilityof this data, it is excluded from most analyses.

Where applicable, all nominal values for conservancy revenue was converted to constant Namibian Dollars (NAD,2012) using a currency deflator.

Years of data collection vary by data source and variable. Aside from training, technical assistance, and select governance data, conservancy-reported data collected by CDSS and NACSO is only available through 2013. Data from the NACSO database also tends to be static for one year (e.g. the number of registered members was only available for 2012). Because grants were awarded in 2012-2014, and most outcome data from CDSS is from 2010-2013, research questions and methods had to be adapted to the availability of data. Where possible, we supplemented conservancy-reported data with data from the baseline (collected for 2010-2011) and endline (collected for 2013-2014) CS/INP household survey. For example, while tourism-related employment data is only available from 2010-2013 from CDSS, survey weights were used to generate conservancy-level totals of employment at baseline and endline. In some cases, using household survey data allowed for greater overlap with MCA-N intervention data.

Where possible, analyses use figures published in the CDSS annual report. More disaggregated figures that were available in the CONINFO database or from conservancy financials were not used, either because of limited date availability (e.g. no figures from baseline), or because figures were not subject to CDSS's rigorous validation process. CDSS often uses financials and other documentation to verify information solicited from conservancies and regional partners. In this verification process, CDSS uses its local knowledge to assess the reasonableness of each data point, follows up with regional partners and conservancies to confirm numbers, or verifies this information during their own field visits to the conservancies. Throughout the evaluation period, CDSS updated numbers as they received new information. As a result, the more disaggregated reports were often not consistent with each other, especially financial data.

4. Analysis and Findings

4.1 Research Question: Does technical support to conservancies improve conservancy governance? Does improved governance impact the equitable distribution of conservancy benefits? (RQ2) and, in turn, increase conservancy revenue?

Does technical support improve conservancy governance?

- Key governance constraints prior to the MCA-N program include lack of accountability, insufficient information sharing, insufficient capacity, lack of member awareness of rights, and lack of respect for quorums at AGMs.
- There is a strong consensus amongst management, as well as conservation leaders, that the governance component is a key strength of MCA-N program. These improvements include increased quality in financial accounting and reporting.
- Not all conservancy members agree that governance has improved, or that it is at an acceptable level. Concerns include transparency and decision-making. This disconnect between management and non-management respondents also exists in perceptions of the equitable distribution of benefits.

Does improved governance impact the equitable distribution of conservancy benefits?

- For meat and cash direct distributions to households, qualitative analysis did not find significant problems of equitability of distribution.
- The larger the area of the conservancy, the less equitable the benefits. The more members, the more equitable the distribution of in-kind benefits.
- Trainings and technical assistance are associated with increased equality of the distribution of benefits within a conservancy.
- However, there continues to be a significant lack of transparency on conservancy income and how it is used.

Good governance is arguably much more critical to the success of the community-based wildlife management programs in southern Africa when compared to what is probably the second largest CBNRM success story – the community-based management of dryland forests in six West African countries. In West Africa, communities manage these forests primarily for the production of wood fuels (fuel wood and charcoal) for urban markets. Community members cut the trees and process them into fuel wood or charcoal. Members are paid when the wood fuels are sold, and receive the bulk of income generated by the community-based forest management. Members who work the hardest receive more income than others. The system is relatively simple, transparent, and equitable.

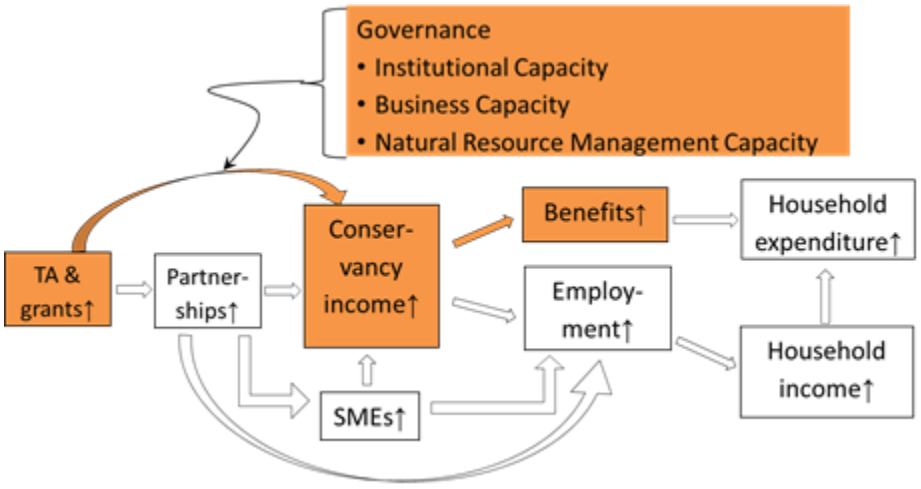
The West African situation is very different from that of the conservancies in Namibia, where nearly all of the income generated by conservancies comes from joint ventures with tourism lodge investors and trophy hunters. All of this "top-down" income comes to the conservancy management structures, not directly to the households. The partnerships between conservancy managers and investors are not transparent to conservancy members. Exceptionally strong systems of good governance are necessary

to develop and ensure equitable systems of decision-making, governing the use of these revenues, and ensuring accountability for the management of these funds. Finally, benefits from joint ventures that do get down to the household level are not a function of what the household has contributed to the conservancy or how hard they have worked.

As **Error! Reference source not found.** illustrates, the Conservancy Support program logic behind a more quitable distribution of benefits involves several pathways. First, MCA-N interventions in the form of technical assistance and trainings are intended to improve governance. Improved governance, through greater democratic participation, financial accountability, and transparency, would influence a more equitable distribution of benefits. In addition, increased conservancy income theoretically should increase the amount of benefits that a conservancy distributes in a year.

The qualitative analysis addresses the relationship between technical assistance, trainings, and governance, as well as whether equitable distributions of conservancy benefits have improved. The quantitative analysis focuses on the link between governance and various measures of the equitable distribution of benefits.

Figure 2: Program Logic: Does improved governance impact equitable distribution of benefits?



Qualitative Findings

Impact on Governance: Key Governance Constraints Prior to MCA-N Program

Conservation leaders were asked what they considered to be the most serious governance problems before the MCA-N assistance began. There was a strong consensus that the key governance constraint was the lack of accountability, especially the accountability of the conservancy management committees to their membership. Below is a typical comment:

"(Management) Committees were not being accountable to members and taking decisions that should have had member approval. Committees were voting themselves loans or engineering things to give themselves large sitting allowances. They were able to do this, because the members were not approving budgets. Financial statements were not being read out at AGM (Annual General Meeting)."

One leader stated that, *"People must recognize their rights and hold their leaders accountable. This is a general problem in Namibia except in the private sector."*

> *A key question is whether members are able to deal with problems as they come up. The program has contributed to institutional resilience and to improving good governance but this will require ongoing support.* - Conservation Leader

Key measures that were cited as needed for improved accountability were strong financial reporting, good financial plans and good reporting at the AGM.

Other important governance constraints identified included insufficient information sharing (often made difficult by the long distances separating people), the lack of respect for quorums at AGM, lack of knowledge about member rights, the provisions of the constitutions, and insufficient capacity.

Impact on the equitability of the distribution of conservancy benefits

All FGD statements that make a clear statement about the equitability of the distribution of conservancy benefits are presented here. One would assume that the opinion of non-management conservancy members is most important on this question. If members do not feel they are benefiting equitably, they probably have much less incentive to abide by the rules and restrictions that are imposed by conservancy management.

Meat and cash are the main forms of benefits that are distributed down to the household level. There is a broad range of benefits, however, and questions on benefit distribution left the definition of benefits open. One will notice that some respondents included training and employment in their responses.

The two FGD for Marienfluss Conservancy both had very similar findings: "*We have not had unfair distributions yet… We look at our conservancy members and the number of animals we are given to kill and we determine how it (the meat) is fairly going to be given to households." (Management members)* There was general agreement amongst the members of the non-management FGD that benefit distribution is equitable. However, there was no indication of change in the amount of meat distributed during the life of project.

"*They (trainings) are done fairly and equally and out in the open." (King-Nehale, member)*

Nyae Nyae members (Non-Management) had this to say:

R4: "I think that the incomes are shared equally amongst the members. Everyone gets the same."

R1: "Even the vegetable garden project, all villages got exactly the same."

R2: "According to the RATA meetings, when they decide on benefits, they also decide how it should be distributed. When you are registered in this conservancy, you are a member. And all members get exactly the same. If one gets a cool drink, everyone gets a cool drink."

R3: "I also would like to add. Before I turned eighteen, I was not a member. But when I registered, I received one of the first cash pay-outs. I got exactly what my father and mother received. So that means that all people get the same income. More important people do not get more. If you are richer or older, you do not get more. You get exactly the same benefit.

A Uibasen manager stated that every member received meat when it was distributed. However, the area has recently been zoned for tourism and hunting has been discontinued in order to not disturb the viewing of wildlife by tourists.

"We always had the same benefits. They were just not always distributed that well. Now they are distributed more equally. For example, in the beginning, the people got N$ 75.00. But as the conservancy keeps going, one year the members got more than N$ 600.00. And like we register the people, we do not know exactly how much each person will get this year." (Nyae Nyae, management)

A Muduva Nyangana Conservancy manager said that they had recently realized that there is a problem with their benefit distribution, but does not specify if they made this realization because of MCA-N funded assistance, nor does he/she say what they plan to do about it*: "…on cash distribution, we have realized that we do not distribute cash in a fair and equitable manner, because we distribute cash in this way. We call the headmen in the villages and we give them the cash, and from there, the headmen and the village development committee sit and decide on what to do with the money. We have received some reports that some headmen use the money for their own use. Sometimes when the money is received by the headmen, some of the cash are given to the different churches in the villages and they perhaps remain with few that they can use to buy diesel for water pumping engines. Through that way, there are only a few people at the village who will know about cash given and the rest would not know."*

> *"Cash in people's hand is extremely tangible. Not everyone benefits from public works -- some don't have kids in school anymore. The reality is that very few conservancies generate enough cash to make a meaningful difference through cash distribution.* - Conservancy Leader

Muduva Nyangana members (Non-Management) have more serious views on benefit distribution. A San member stated, *"For example when they slaughter an elephant, others are given bigger chunk of meat and I always get smaller ones. For others, they can cook it for two days, while mine is only for that day!"* A non-San member reported, *"…when it comes to employment, some of our colleagues like the ones we are sitting with here, who have a lighter skin (the San people) are not considered for employment, when there are opportunities for employment."* This was confirmed

by the same San member that is quoted above *"it is true that we in lighter skin are not considered for employment. There was a time when one of us was employed in the conservancy, but after six months, we just saw our friend is back home and he said he was taken out (fired)."* (No follow-up question was asked.)

Uukwaluudhi Conservancy manager stated that, *"Yes, they are distributed fairly and equally because when we are distributing the benefits. We follow the documents that are set up for distributing the benefits."* The non-management members, however, had a very different view. All FGD non-management participants are very unhappy with the conservancy management. They get no information. There are almost no meetings held. They don't know what income is or what there is for distribution. They suspect management is appropriating the benefits for themselves. Here is a quote from the discussion in response to a question on whether they have a chance to take part in the decision on how the benefits should be distributed?

> *R1: "We could be having a chance if we were coming together and get to know the benefits that are there, now I can't decide because I don't know what comes and I don't know where it reaches first, we are just in the air, like me I will think maybe the benefits are ending at Tsandi where the senior management is.*

A King Nehale member stated *"…some people got training over and over. Now they have decentralized."* Training is now being planned to cover a broader cross section of the members.

Finally, a conservation leader finds that, *"With MCA-N support, decision making on benefit sharing is being taken away from the committee and it's moving it to the AGM. This project has helped, but it hasn't solved all the problems. Constitution revision and benefit planning all contribute to better governance, but this is all ongoing. Each conservancy goes up and down over time. The key question is whether members are able to deal with problems as they come up. The program has contributed to institutional resilience and to improving good governance but this will require ongoing support. You still need an outside agency to help guide the conservancies in the right direction.*

Conservancies have legal obligations such as on financial reporting, but the MET (Ministry of Environment and Tourism) does not do compliance monitoring. In Kunene, MET has two wardens for over 30 conservancies. They are supposed to attend every AGM and make sure things are done properly. Compliance monitoring is a stick. MET came out with guidelines for benefit distribution planning. I don't think it has been used.

There is a trend for increasing revenues to get absorbed in operational costs. Community members have reacted against that and it has led to rebellions by members against committees."

Cash versus in-kind

One topic that has been hotly debated in the conservancy program in Namibia, just as it is debated in other countries, is the relative merit of the distribution of benefits in cash versus in kind. Opinions in

Namibia are very much divided on this issue. The one point of near universal consensus is that the decision should be left to the communities.

A conservation leader had this to say, *"Cash in people's hand is extremely tangible. Not everyone benefits from public works -- some don't have kids in school anymore. The reality is that very few conservancies generate enough cash to make a meaningful difference through cash distribution. There are only 2 or 3 conservancies that do cash distribution. One (conservancy) does soup kitchens for highly disadvantaged people (Tora). Christmas gifts are given for elderly people. Money for schools and clinics are very good uses. Of course, one can question that conservancies should be funding things like schools and clinics."*

What we hear, particularly in Caprivi, is that cash distribution seems to be a default setting when there are not good ideas for investing in good projects. In their minds, good projects are a better investment if they create jobs or incomes. Others give good examples of how cash can be quite useful. Nyae Nyae members view cash distributions as very important. They have few other ways of getting cash and stressed that communities must feel the cash is theirs to use as they please. A conservation leader said, *"It is a real strength that communities are free to choose. Every community has their specific needs."*

Interestingly, many government officials insist that money should be used for community projects. An MCA-N manager believes that cash works best for small numbers of members and public works best for large numbers. This is interpreted to mean that if there are many people, the amount of money that could be distributed per household is insignificant whereas something like a school or a bore hole can be perceived to provide benefits for the full community. He went on to add, *"For conservancies with a smaller membership base, members are able to benefit from cash distribution even though they are not living inside the conservancy – such as people who live in town and their children. Conservancies like Nyae Nyae, where they predominately have opted for cash, they are low in numbers. They value cash and employment. The disadvantage is that they have very low literacy levels and very low entrepreneurial skills. Money is used for drink. However, it is still an effective incentive."*

This same person feels the advantages of public goods (in kind distribution) *"have more advantages than disadvantages. Many conservancies in the Zambezi Region do public goods. For example, women's sewing projects, gardening projects, and taxi investment. It tends to work well when you ask the members because money circulates in local economy. But people (the community) should be free to decide on their own."*

One implementer stated that he/she did a study on this a few years ago. *"There was a backlash against cash in the NGO community. Now that thinking has turned a bit. Cash distribution is highly transparent – everyone gets cash. For any other type of project, this won't be true. This is the one key decision they (conservancy members) get to make each year – what to do with their cash."*

Marienfluss members (non-managers) also had mixed opinions. Some prefer food, others prefer cash with an agreement that it should be left to the community to decide. However, it was observed that in kind public works investments can be subject to elite capture. One of the Marienfluss Conservancy managers told this story:

"Boreholes were drilled here in this land with the conservancy money, engines were bought that would be used to provide water to the cattle. So the person who currently uses that borehole is the strong one. The weak ones are pushed behind rocks. Therefore the borehole seem as though it is not a communal thing. While at that we asked for another driller under the joint venture to drill water for us. The water came and there are tensions. Some people feel like the boreholes are theirs even though before drilling we announced to the community that we are drilling."

All five Muduva Nyangana members in the FGD agreed that cash is better than in kind. One said: *"…the in kind one is not good. If you have worked for something, you should be paid immediately, these things of waiting is not good."* The Uukwaluudhi Management FGD had no strong preference for cash versus in-kind.

Conflicting views from Management and Non-Management FGD

The Omantendeka Management FGD paints a very positive picture of changes to governance. One manager said, *"In the past an AGM looked like a quarrel but according to the law it should be just for a day and the other it ends but now according to the general meetings and the way people are well informed it takes a day and half or just a day. That means people have been informed."*

On the other hand, all Omantendeka members made negative statements when asked if the AGM is well organized. One answers, *"It is not well organised because one year it is hosted whilst the other it is not."* Another says, *"The awareness of it is also not broad."* The moderator then asked, "When it sits is everyone allowed to express themselves in giving their opinions? One responded, *"We are not given the opportunity to express ourselves; we are told that there is no time for questions".*

Omantandeka managers said they have a new benefit distribution plan and this will be a permanent document. Two of them said that distribution is now significantly broadened. Members present a very different situation:

"When the conservancy started we were told that animals will no longer be killed, there is now someone who will buy the animals. In the beginning we would be told that there is this hunter, they will kill a certain number of animals and the profit is deposited in the bank, but now we are never told about it."

Two members of the Omantandeka management FGD favoured in kind distribution. One said, *"There are permanent things such as a school. That is a permanent thing that will help the community, so I think a benefit that will benefit different generations is the greatest compared to a thousand that you can spend overnight and cannot point at one thing that you did with the money."* Two Salambala managers favour in-kind distribution. One said cash is just used for useless things. Meat is considered a very important in-kind good.

Nyae Nyae managers said that most of the members want cash. Before the benefits are distributed, the Board decides how they will distribute the benefits; every member will get it in the same way so one cannot get it in-kind and then others in cash, and most people prefer cash.

Issues of governance

There is general agreement amongst conservancy leaders, implementing partners, MCA-N staff, and conservancy managers from the FGD that the conservancy program, and MCA-N support in particular, has had strong positive impacts on governance in the conservancies. The viewpoints of the conservancy members, as expressed in the Non-Management FGD, have been considerably more negative. Although non-management FGD indicate that much progress has been made, it is clear that many governance problems remain and the types of problems and their severity varies considerably from one conservancy to another. These opinions are corroborated by the KIIs.

Three non-management members from Marienfluss Conservancy indicate governance has gotten worse in the past three years. For example, one stated, …. *"It is no longer good. We are not informed about decisions taken and we don't have meetings taking place here."* One of them remarked, *".. the money is well spent the only problem is the meetings. Sometimes they give the financial reports but the meetings are dead."* Three of the four members say they don't know their rights, or the rules and laws of the conservancy. Most FGD participants said they live far (from the conservancy headquarters) and they are not informed about what is happening in the conservancy.

Three Muduva Nyangana members (non-management FGD) all said that the conservancy management committee goes through the motions of consulting the members, but they then do as they please.

> *1st opinion: "Regarding decisions, the conservancy members are also consulted by the management committee, but our decisions are not considered. They only consider their own decisions."*
> *2nd opinion: "My colleague no 2 has said it all already. Our opinions are not considered".*
> *3rd opinion: "We all view it that way."*

However, on a more positive note, the same members stated that game populations and natural resources have increased.

On issues of governance (See text box), one finds a disconnect between the perceptions of management versus members. One of the managers states, *"We have managed to apply all the techniques and skills. Whatever we have been trained, we are applying them, that is why the name of Muduva Nyangana Conservancy is always on the radio and in the newspapers, praising the activities we are doing in the conservancy. We really have managed to apply everything successfully."* Another said, *"We are also able to organize the annual general meetings to which we invite the members… We are also able to receive information from all corners of the conservancy".*

The members of the same conservancy report a completely different situation. They recognize what their rights are but feel that their rights are being violated by an unresponsive management committee. A first member states, *"According to the constitution of the conservancy, we are the ones who are sitting here, who supposed to decide on how the benefit should be distributed. However in our conservancy, this does not happen that way, the management committee just make their decisions without no consultations, they just dominate us.*" Another member says, *"You know… It is just like the constituency councilors, you elect them, but when they get to power, they don't look at you who voted for them. It is the same as in our conservancy also. We elected them but they don't listen to us".*

Lack of prosecution for stealing community funds

The 2013 evaluation indicated that no one had ever been prosecuted for stealing conservancy funds..

Three conservation leaders felt the unwillingness to prosecute is definitely a problem. One felts that people definitely should be prosecuted, but is unaware that this has ever been done successfully. He/she says there is an unresolved court case at Mayuni Conservancy. NGOs have tried unsuccessfully to get the government to arrest someone at the Dotsi Conservancy (which is not an MCA-N supported conservancy). Conservancy managers do get kicked out of office for fiscal fraud, but community members are generally unwilling to prosecute. One leader feels a key part of the problem is that government isn't doing its job enforcing the legal obligations of conservancy managers – such as the submission of annual financial reports. This makes it difficult for NGOs to address such issues.

The same conservancy leader also believes, however, that game quotas are enforced. And one MCA-N manager says that some cases of stolen funds have been reported to police. In addition, some conservancies have dealt with such problems in house and this has been effective – even in recovering stolen assets. They usually go through the traditional authorities.

Some members feel conservancies leaders are not following their roles: *"In this conservancy, people don't follow job descriptions… The chairperson is doing the work of the treasurer and treasurer is doing the work of the secretary. Their job description is not clear to them."* In addition, one member brought up a lack of financial transparency, although other members did not have an opinion on this:*"For me the aspect of conservancy governance that I feel is not fair, is that of financial management. The management committee don't always give clear financial report. Sometimes you hear about missing receipts. And they take very long to do that financial report. They need to improve on that aspect of management."*

Modern management principles can be new concepts to many rural Namibians. Here are Nyae Nyae management committee members speaking of what they have learned: The first said, *"The policies we have for staff – it is there. Every worker knows what time he must start, how he must behave, how much leave he gets… Everyone knows about that now and I really hope that they will work according to this now. You can see that we manage the meetings better. We take minutes. Maybe it is not that great yet, but we do it in that way. I think we handle things much better."* Another said, *"When a staff member has done something wrong, you have to outline what they did wrong. That is very difficult. It is very difficult to tell a person that he is wrong and exactly why he is wrong. And then it is difficult for that staff member to defend himself. And it is not something we practice a lot. And I think this is very difficult to deal with for a management member."* Members are increasingly speaking their mind at the annual meetings. *"Everyone can speak… These are dangerous meetings. They can say what they want and they can say what they feel. They do not always like what management does and then they will say it*." A final

perspective, *"And I think my colleagues agree that we have learnt a lot. And I know that there is still a lot to come."*

An Uukwaluudhi member speaks on what appears to be election fraud. *"I will say they are not fair because they are always done on one side. …I have noticed the selections were done after the meetings… …people went out and stand somewhere there and when they came back they have reselected the old chairperson that was there before… That is why we are saying that they are not fair."*

A King Nehale member says he/she knows her rights and responsibilities. When he/she see something being done that is not right, he/she will speak about it. Another member says the annual meetings are well prepared. Anyone can speak their mind at the AGM. King Nehale conservancy members were the only non-management respondents that were overwhelmingly positive about the governance of their conservancy.

An implementer who has been with the conservancy program since the beginning said*, "I appreciate more than ever the need for good governance. Chris Thouless pushes for proper financial audits. You uncover all sorts of things and a range of issues. CDSS has drilled drown deeper. They are not quite a statutory audits; they cost 30,000 N$ each. They are fantastic for drilling into the hidden transcripts of governance."*

One conservation leader who has been involved since the beginning stated, *"Conservancies have brought rural democracy to rural areas and no other program has done this."* Another conservation leader stated that with MCA-N they have been able to ratchet up the quality of the AGM, the constitutions, the quorums, the procedures, the reporting, and the financial planning procedures. Lots of good work has been done there. Lots of improvements have been made on financial management. A huge amount of training has gone on. People understand their roles, although they don't necessarily act on their roles. Often the older people are elected whereas the younger people are more dynamic.

An MCA-N manager feels that governance support has been quite successful. He/she feels that most objectives have been achieved, but the results are quite tenuous. There has been a lot of hand holding. Another conservation leader feels that one can nudge conservancies along towards better governance and that support needs should diminish over time. He/she feels that a key driver of members demanding accountability is whether there is enough money coming in. If a conservancy only earns 50,000 $N, people may not take interest If there is a million or 2 at stake, people should take much greater interest.

Quantitative Findings

Qualitative findings suggest that while conservation leaders, implementers, and management note that governance has improved over the course of the evaluation period with external help, some members of the conservancy are not experiencing the impacts of improved governance. To better understand the relationship between changes in governance and its tangible impacts amongst conservancy members,

we use quantitative methods to determine whether or not changes in governance are linked with a more equitable distribution of benefits. We focus on the relationship between MCA-N interventions, conservancy governance, and the equitable distributions of conservancy benefits. The quantitative analysis primarily focuses on the link between governance and benefits.

First, we provide some background and contextual data to better understand our outcome of interest: the equitable distribution of benefits. We examine trends in benefits distribution, including the amount distributed by type of benefit, any increases and decreases across the evaluation period, the distribution of these benefits amongst members, as well as member perceptions of fairness around the distribution of benefits. We also look at both conservancy-reported data, where available, and data reported through the CS Household Survey. We also examine trends in indicators of conservancy governance across the evaluation period.

In the analytical approach section, we hypothesize that improved conservancy governance would lead to a more equitable distribution of outcomes. We employ various measures of equality distribution to analyze the link between governance and benefits distribution. We then discuss the results of the analysis.

Background

We have two data sources that report the distribution of benefits: cash and in-kind benefits that conservancies report distributing, and cash and in-kind benefits that households report receiving. Using these data, we construct several indicators at the household and conservancy level that quantify the share of benefits across different demographics.

Not all households in the household survey sample receive benefits from the conservancy. The survey data indicate that 20% of all households receive some kind of cash benefits and 40% of all households receive some type of in-kind benefit. The percentage of households that receive both cash and in-kind benefits is 15%. On average, for households that receive those benefits, the value of cash benefits exceeds that of in-kind benefits. Table 7 shows the mean value of cash and in-kind benefits at baseline and endline.

Table 7: Cash and In-Kind Benefits by Household

Type of Benefit	Baseline (2010-2011)			Endline (2013-2014)		
	Average[(a)] per household[(b)]	Total Received[(b)]	Number of households (n)[(d)]	Average per household[(b)]	Total Received[(b)]	Number of households (n)[(d)]
All benefits (Cash and In-Kind)[(c)]	$584	$5,869,780	527	$791*	$8,147,351	452
In-Kind	$337	$3,066,248	485	$239*	$2,215,943	404
Cash	$834	$2,803,532	164	$1,274*	$5,931,408	134

Source: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014)

Notes: *indicates statistically significant difference between baseline and endline at 1% level. [(a)] Averages calculated over all households that receive the particular benefit. [(b)] These are estimated population totals using sample weights. [(c)] Cash and in-kind refers to households that received *either* cash or in-kind benefits. [(d)] While the percentages are estimated using population weights, the corresponding numbers of households are taken directly from the sample. [(e)] All figures are reported in 2009 NAD.

Data from CDSS tell a similar story; the total amount of all benefits distributed increases over time. Note that these measures are not directly comparable with the household survey totals due to sampling error, the availability of similarly defined measures (e.g. no reliable and verified cash-only measures were available from conservancy management), and regional differences in the valuation of goods and services.

Table 8: Total Benefits Distributed, Reported by Conservancies

Year	2010	n	2011	n	2012	n	2013	n
Total Distributed	$7,215,729	29	$7,637,914	29	$8,860,718	29	$9,257,007	29
Benefits (Cash and In-kind)	$3,006,816	26	$2,974,163	26	$3,227,615	26	$3,462,946	27
Meat Value	$4,208,913	26	$4,663,751	27	$5,633,103	28	$5,794,061	28

Source: CDSS Annual Report, 2013.

Notes: All figures are reported in 2009 NAD.

At the end of the evaluation period, households were asked whether they thought benefits were fairly distributed (this question was not asked at baseline). Cash paid in school fees or support for funerals and ceremonies performed better than other types of cash benefits. Food, such as meat, is the most common type of benefit received by households, and distributed across most conservancies. On average (by conservancy), 41% of households responded that the distribution of meat benefits was fair.

Table 9: Perceptions of Fairness of Benefit Distribution by Household (percent)

Benefit type Endline (2013-2014)	Do you think the way the [BENEFIT] is distributed is fair? (% positive, average response by conservancy)	Benefit distribution is…		
		Fairer now than in 2010	*As fair as in 2010*	*Less fair now than in 2010*
Transport (in-kind)	86%	64%	25%	11%
School Fees (cash)	84%	69%	15%	15%
Support for funerals/-ceremonies (cash)	79%	52%	41%	7%
Fuel (in-kind)	69%	28%	10%	62%
Cash paid directly to HH (cash)	60%	40%	23%	37%
Other cash benefit (cash)	58%	48%	11%	41%
Loans (cash)	50%	0%	50%	50%
Food (such as meat) (in-kind)	41%	40%	17%	43%
Compensation for HWC (cash)	36%	50%	7%	44%
Non-game natural resources (in-kind)	33%	6%	10%	83%

Source: NORC CS Household Survey Endline (2013-2014)

Notes: Percentages are estimated using population weights.

Table 10: Number of Survey Respondents and Conservancies Receiving Each Type of Benefit

	Households (n)		Conservancies (n)	
	Baseline (2010-2011)	Endline (2013-2014)	Baseline (2010-2011)	Endline (2013-2014)
Food (such as meat) (in-kind)	410	474	27	25
Cash paid directly to HH (cash)	86	122	15	14
Transport (in-kind)	55	28	13	9
Support for funerals/-ceremonies (cash)	36	39	14	12
Compensation for HWC (cash)	29	31	10	13
School Fees (cash)	21	18	6	10
Other cash benefit (cash)	15	8	5	5
Fuel (in-kind)	12	23	9	2
Loans (cash)	3	2	3	1
Non-game natural resources (in-kind)	2	18	1	9

Source: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014)

Notes: Household n values represent the numbers of households in the sample who indicated they received a particular benefit. Conservancy n values represent the number of conservancies that had at least one household that reported receiving a particular benefit.

On average, the majority of recipients (at least 50%) perceived cash and in-kind benefits as fair. However, respondents were more likely to find that cash benefits were fairer now than in 2010 versus in-kind benefits. Qualitative findings help contextualize this; while very few conservancies distribute cash benefits, the tangible and quantifiable nature of cash benefits makes it easier to enjoy and articulate the benefits, as well as compare the amount you receive to your neighbor or other members in your community.

In Table 11, we see a divide in perceptions at endline between members of management committees and non-members: across each benefits category where there were both management and non-management respondents, we find a statistically significant difference between perceptions of fairness, with management committee members more likely to say that benefits are fairly distributed. FGDs with management and non-management respondents also reveal a similar divide in perceptions around governance and the fair distribution of benefits.

Table 11: Perceptions of Benefits Distribution Fairness Among Management and Non-Management Respondents.

Do you think the way the [BENEFIT] is distributed is fair? (% positive)	Non-management	Management	n
Food (such as meat) **(in-kind)**	45%	80%*	452
Support for funerals/ceremonies **(cash)**	80%	95%*	32
Compensation for HWC **(cash)**	54%	2%*	28

Source: NORC CS Household Survey Endline (2013-2014)

Notes: *indicates statistically significant difference between baseline and endline at 1% level. Percentages are estimated using population weights.

Because we hypothesize that governance is linked with the distribution of benefits, we also employ several measures of governance, democratic participation, and transparency in our analysis. Among the governance indicators, AGM participation and financial performance are of particular interest when examining the link between governance and benefits distribution. We are interested in knowing whether or not there was an increase in governance scores during the evaluation period.

We see that across several indicators, average governance performance has increased between baseline and endline.

Table 12: Governance Indicators, Baseline and Endline.

Average (across all conservancies)	AGM attendance[(a)]	AGM general compliance[(b) (c)] indicator (out of 20)	Financial Performance indicator[(b) (d)] (out of 11)	Governance indicator (out of 10)[(b) (e)]
Baseline (2010-2011)	38%	11.7	6.7	3.5
Endline (2013-2014)	59%*	12.4*	8.0*	5.9*

Source: [(a)] NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014); [(b)] 2014 CDSS Final Report (2010 and 2013 values).

Notes: Averages are across the 29 conservancies, not their member-households. [(c)] AGM general compliance indicator is an indicator constructed by CDSS. Inputs into the score include: whether AGM was called, AGM held, whether a quorum was attained, attendance register kept, minutes taken, chairpersons report, financial report and & budget presented and approved. [(d)] Financial performance indicator is an indicator constructed by CDSS. The score consists of 11 measures of routine financial management. These include the existence and use of a policy document, monthly reconciliations, requisition procedures, filing and record keeping, banking of income, issuing of receipts, report preparation and independent review. [(e)] The governance indicator is a straight average of ratings of AGM compliance, benefits distribution, constitution, breakdown of gender in the management committee, and financial performance. [(f)] * indicates statistically significant difference between baseline and endline at 1% level.

Analytical Approach

We hypothesize that improvements in governance would result in a more equitable distribution of benefits. Stronger AGMs could lead to greater transparency of management committee decisions on benefits distribution, as well as more visibility into the benefits distribution process. With increased participation from a wider and more diverse pool of conservancy members in deciding how benefits should be distributed, conservancy members may demand more equitable distributions. Increased capacity in

financial performance could be linked to better benefit management as well as greater financial transparency.

In order to test these links, we employ several methods and measures of benefit distribution and governance. The key outcome indicator is the Gini coefficient for each stream of conservancy benefits. The Gini coefficient is a commonly used measure of inequality. It ranges from zero (indicating perfect equality – every member gets the same amount) to one (indicating absolute inequality – one person gets everything). Gini Coefficients are calculated for cash and in-kind benefits combined, in-kind benefits only, and meat benefits only. These calculations are provided for each round and also on a combined basis.

Decisions on how many and what type of trainings and technical assistance were provided during the evaluation period were based on baseline assessments of the level of governance of a conservancy. The number of trainings that a conservancy received as well as improvements in the governance score could be a function of the conservancy's initial performance at baseline. Poorer-performing conservancies may receive more trainings on a particular topic; similarly, higher performing conservancies may receive more targeted trainings. In the other direction, CDSS trainings in governance are expected to lead to changes in inequality (the Gini Coefficients). To analyze whether changes in governance impact the equitable distribution of conservancy benefits, therefore, we must confront (control for) this possible endogeneity (reverse causality). We do this by introducing a selection equation to our model which uses exogenous or pre-determined explanatory covariates to capture – and, therefore, block – this reverse causation, reducing this potential threat to internal validity.

This is accomplished in several steps. First, we specify an equation to model the amount of training (treatment dosage), $T_{i,t}$ that CDSS "selected" for each conservancy. Second we estimate this equation econometrically as $\Pr(T_{i,t} = N_{i,t}) = \mathcal{P}[\boldsymbol{\gamma X_{i,t}}]$, where $\mathcal{P}$ stands for the Poisson distribution and *N* ϵ {0,1,2,…}.[19] Here,

$$\boldsymbol{\gamma X_{c,t}} = \gamma_o + \gamma_1 I_c^{\mathrm{AR}} + \boldsymbol{Z_{c,t}\gamma'_Z} + \varepsilon_{c,t} \quad (1)$$

where I_c^{AR} represents one of four ARD conservancy governance indicators for conservancy *c* in 2010; $\boldsymbol{Z_{c,t}}$ is a vector of conservancy characteristics at time (round) *t*; and $T_{c,t}$ represents one of several indicators of the number of trainings conducted for conservancy *c* received by time *t*. (Note that $T_{c,0} = 0$, that is, at baseline no training or TA had been administered.) Finally, we use the estimated equation to predict the values of $\hat{T}_{c,t}$ for each conservancy based on the latter's characteristics specified in the selection equation.

[19] The Poisson model is widely used to study count variables, such as the number of trainings a household attends.

In fact, we carry out these three steps separately for the following training indicators: *total_train* (the cumulative number of all types of trainings or days of technical assistance), *total_institutional* (the cumulative number of institutional/governance trainings), *ta_inst_gov* (days of institutional/governance technical assistance), *ta_inst_all* (number of days of technical assistance on institutional and governance topics), and *total_distpbs* (cumulative number of benefits distribution plan trainings). I_c^{AR} includes baseline scores from the ARD assessment, including: *ARDdem* (overall democracy and governance indicator), *ARDfin* (overall financial management indicator), *ARDben* (benefits distribution implement indicator), and ARDcap (instl capacity indicator). In the selection equations estimated, $\boldsymbol{Z_{c,t}}$ comprises the following variables: *latdg* (the conservancy's latitude, which also proxies the distance to Windhoek), *regmem* (the number of registered members in conservancy *c* in 2011), *ageyear* (the number of years since the conservancy started operating), *area* (the size of the conservancy in 100,000s of square kilometers).[20]

Each estimated selection equation can be used to predict the dependent variable, $\hat{T}_{c,t}$. We introduce these predictions into our attribution (outcome) equations to capture what training would be necessary based on the best available information at baseline. We represent these "propensity" variables as I_c^*, below, recognizing that this term is a short-hand for twenty potential variables (that is, the number of combinations the four ARD*i* variables with each of the five training variables described in the previous paragraph).

With the propensity variables in hand from the predictions made using the estimated selection equations, we then run the following attribution regressions on the panel data set to evaluate the relationship between governance and equality of distribution of benefits:

$$G_{c,t} = \beta_o + \beta_1 T_{c,t} + \beta_2 I_{c,t}^{\mathrm{Gov}} + \beta_3 I_c^* + \boldsymbol{Z_{c,t}\gamma_1'} + \varepsilon_{c,t} \quad (2)$$

$I_{c,t}^{\mathrm{Gov}}$ represents conservancy *c*'s governance score. Note that we run our analysis using several different measures of governance: CDSS's overall Governance Indicator, which captures all aspects of institutional governance, CDSS's AGM general compliance indicator, which just focuses on AGM performance and transparency, and CDSS's financial management indicator, which focuses on financial compliance and transparency. We also use the percent of households that report attending an AGM at baseline and endline from the CS household survey to capture democratic participation. The purpose of this profusion of estimations is to ensure that any findings are robust and not simply the result of one specification.[21]

[20] The natural log of this variable is often used instead.

[21] While the reader is excused for finding this approach tedous, we utilize this seemingly redundant process throughout the report for the reasons explained in the footnoted sentence.

Alternatively, it is also possible to examine whether *changes* in the governance score or technical assistance impact the *change* in the Gini coefficient:[22]

$$\Delta G_c = \beta_o + \beta_1 \Delta T_c + \beta_2 I_c^* + \boldsymbol{Z_c \gamma_1'} + \varepsilon_c \quad (3)$$

Here, the variables are as defined, above. The I_c^* term controls for the initial conditions on the theory that a change in the Gini Coefficient over the evaluation period will depend on the initial level of governance. Note that the time subscripts have been dropped since the equation has been differenced so only only cross-section remains.

Findings

Across the conservancies in the sample, at endline Gini coefficients ranged from more equal in N#a Jaqna, Balyerwa, and Nyae Nyae, to more unequal in Sesfontein. [23] Gini coefficients were also calculated using only in-kind benefits and only food benefits received by households. A table comparing the Gini coefficients for each type of benefit is presented in Table 15. As the values in this table show, the Gini coefficients are very similar whether calculated with combined cash and in-kind benefits, only in-kind benefits or only food benefits. Moreover, the three measures are quite correlated, as is seen in Table 13. The table also reveals that the correlation among the three measures became even more correlated over time. Still, Hotelling tests of means (not shown) indicate that on average across the two rounds only conservancies in the regions of Caprivi, Kavango, and Kunene had statistically significantly different coefficients on these three measures. Likewise, we find that the distribution of benefits (not shown) tended toward slightly greater fairness over time (except for meat-only benefits). However a one-way analysis of variance finds that differences across these measures at each round are not statistically significant.

[22] For space considerations the results for this specification are not discussed. They are similar to those of Equation 2.

[23] Since the objective of the original sampling design was to ensure small enough variation to make population-level statistical statements and not conservancy-level statistical statements, the reported Gini coefficients degree of values of the individual conservancy figures should only be taken as indicative.

Table 13: Correlation between overall, in-kind, and meat Gini Coefficients (by round)

	Baseline		Endline	
	Overall	In kind	Overall	In kind
In kind	0.8061 (0.0000)		0.8942 (0.0000)	
Meat	0.5545 (0.0027)	0.7059 (0.0000)	0.6938 (0.0001)	0.8292 (0.0000)

Notes: p-values in parentheses. *Source*: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014).

Table 14: Correlation between Gini Coefficient and measures of governance (baseline)

	CDSS[(b)] (2011) Governance	ARD[(c)] (2010)			
		D&G	Financial Management	Benefit Admin.	Institutional Capacity
ARDdem	0.08 (0.69)				
ARDfin	0.01 (0.96)	0.63 (0.00)			
ARDben	0.31 (0.13)	0.63 (0.00)	0.40 (0.05)		
ARDcap	0.02 (0.94)	0.58 (0.00)	0.85 (0.00)	0.44 (0.03)	
Gini[(a)]	0.04 (0.83)	0.03 (0.88)	-0.28 (0.17)	-0.12 (0.56)	-0.10 (0.65)

Notes: p-values in parentheses. *Sources*: (a) NORC CS Household Survey Baseline (2010-2011). (b) CDSS database. (c) ARD *Namibia Conservancy Needs Assessment* (MCC report), 2011.

Another key input into our impact analysis are the governance indicators from CDSS and ARD. Their relationship is summarized in Table 14 by a set of bivariate (unconditioned) correlations. While the ARD and CDSS indicators are only one year apart, the CDSS indicator is surprisingly uncorrelated with any of the ARD indicators. On the other hand, the ARD indicators are, among themselves, quite correlated. Among this ARD group, the highest correlation is between financial management and overall institutional capacity. This is not surprising since the latter is a component of the former. Finally, note that neither organization's indicators is correlated with the overall Gini Coefficient.

Table 15: Endline Gini coefficients by benefit type

Conservancy	Gini Coefficient (cash and in-kind benefits)	Gini Coefficient (in-kind benefits only)	Gini Coefficient (meat benefits only)
Orupembe	0.503	0.511	0.511
Sanitatas	0.560	0.560	0.560
Ehirovipuka	0.498	0.508	0.446
Omatendeka	0.724	0.724	0.528
Sesfontein	0.887	0.471	0.388
Torra	0.564	0.509	0.419
Puros	0.373	0.370	0.222
Anabeb	0.665	0.509	0.509
Marienfluss	0.354	0.359	0.359
Doro !Nawas	0.432	0.413	0.545
Uibasen	0.509	0.631	0.665
#Khoadi //Hoas	0.643	0.606	0.526
Uukwaludhi	0.568	0.497	0.497
Muduva Nyangana	0.751	0.650	0.517
George Mukoya	0.751	0.747	0.567
Nyae Nyae	0.285	0.337	0.287
N#a Jaqna	0.268	0.268	0.288
Kwando	0.315	0.315	0.315
Mayuni	0.558	0.622	0.616
Mashi	0.314	0.376	0.376
Wuparo	0.751	0.774	0.385
Balyerwa	0.271	0.198	0.198
Sikunga	0.443	0.320	0.320
Muduva Nyangana	0.751	0.650	0.517
George Mukoya	0.751	0.747	0.567
Salambala	0.369	0.363	0.363

Notes: There was insufficient household-level data on benefits to calculate a gini coefficient for Sorris Sorris, Sheya Shuushona, King Nehale, Uukolokadhi-Ruacana
Source: NORC CS Household Survey Endline (2013-2014).

Table 16: Confidence intervals of endline Gini Coefficients (at 95 percent)

Gini benefit category	Mean	Std. Err.	[95% Conf. Interval]	
			Lower	Upper
Cash and In kind	.4961111	.031697	.430957	.5612652
In kind	.446037	.0277433	.3890099	.5030642
Meat	.4003333	.0219477	.3552192	.4454474

Notes: Based on 27 observations. *Source:* NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014) in Table 15.

Table 17a: Propensity variable regressions to control for selection bias

Dependent Variable: **Cumulative trainings (institutional and all)** **Year: Baseline (2010)**				
	(1) Cumulative institutional	(2) Cumulative institutional	(3) Cumulative all training	(4) Cumulative all training
ARDdem	-0.16		-0.19	
	(0.16)		(0.21)	
ARDben		0.14**		0.16***
		(0.063)		(0.060)
Cy. area	3.33	5.71***	8.24*	7.90***
	(2.35)	(0.87)	(4.28)	(2.20)
Cy. lattitude	0.20***	0.10***	0.062	-0.049
	(0.030)	(0.035)	(0.039)	(0.057)
Cy. Age	-0.25	-0.38*	-0.20	-0.48***
	(0.21)	(0.20)	(0.23)	(0.16)
Nr. of mem-bers	-5.63***	-7.23***	-5.95***	-7.22***
	(1.31)	(1.22)	(1.52)	(1.85)
Constant	-1.02	0.51	2.16***	4.16***
	(0.75)	(0.84)	(0.79)	(0.97)
Wald χ^2	99.36	116.82	42.29	43.60
Prob > χ^2	0.0000	0.0000	0.0000	0.0000
Obs.	24	26	24	26

See notes at the end of Panel C.

Table 17b: Propensity variable regressions to control for selection bias

Dependent Variable: **Cumulative technical assistance (institutional and all)** **Year: Baseline (2010)**				
	(5)	(6)	(7) Cumulative	(8)
Variables	Cumulative all instl'l TA	Cumulative all instl'l TA	governance TA	Cumulative governance TA
ARDdem	0.59**		1.07**	
	(0.26)		(0.44)	
ARDben		0.23***		0.38**
		(0.071)		(0.16)
Cy. area	17.1***	11.7***	29.0***	15.9***
	(3.09)	(1.13)	(6.17)	(3.28)
Cy. lattitude	-0.035	0.010	-0.23*	-0.096
	(0.055)	(0.036)	(0.12)	(0.11)
Cy. age	-0.60*	-0.38*	-1.00**	-0.75**
	(0.32)	(0.22)	(0.49)	(0.33)
Nr. of mem-bers	-6.69***	-6.38***	-10.9***	-9.37***
	(2.04)	(1.82)	(2.76)	(2.24)
Constant	5.35***	4.91***	7.68***	6.43***
	(1.13)	(0.80)	(2.16)	(1.96)
Wald χ^2	49.04	158.64	31.05	28.98
Prob > χ^2	0.0000	0.0000	0.0000	0.0000
Obs.	24	26	24	26

See notes at the end of Panel C.

Table 17c: Propensity variable regressions to control for selection bias

Dependent Variable: **Cumulative benefits training, Baseline (2010)**		
	(9) Cumulative benefits distribution planning	(10) Cumulative benefits distribution planning
ARDdem	(b)	
ARDben		2.07*** (0.54)
Conservancy area	(b)	46.5*** (12.9)
Cy. lattitude	(b)	0.10 (0.51)
Conservancy age	(b)	2.64 (2.40)
Number of members	(b)	-31.6 (22.7)
Constant	(b)	-18.0* (10.6)
Wald χ^2 Prob > χ^2	(b)	40.44 0.0000
Obs.	(b)	26

Notes: OLS regressions with robust standard errors (in parentheses). Data for the Gini Coefficients are from the NORC Conservancy Household Survey (2011 and 2014). All other data is from the CDSS Monitoring database (2010-2013). (a) See text for an explanation of the ARD variables. (b) Poisson regression did not converge.

Table 17a through Table 17c provide the details of the estimations of Equation 1 from which predictions are generated as propensity variables to block reverse causality in the regression models of Equation 2. These estimations are carried out for each of the two measures of training and two measures of TA. Note that these estimations needed to be run using information available (in principle) to CDSS *ex ante* for establishing the amount and type of training and TA they would program for each conservancy. Amounts beyond (or below) the levels predicted by these estimated equations likely reflect feedback from the intermediate outcomes back to the level of training or TA. By including these predictions in the attribution equations (training/TA impacts on the Gini Coefficient, for instance) we can isolate (control for) this confounding channel of feedback.

Table 17a reveals that for for institutional training (all types) the physical size (positively), number of members (negatively), and pre-intervention level of benefits administrative capacity (positively) influenced the amount of training CDSS provided to a conservancy. These results are repeated in the case of training of all types combined. Table 17b, in turn, reinforces the results from training but for TA. Moreover, for TA, the relationship are even more pronounced, with both ARD indicators showing (positive) statistical significance. Finally, in Table 17c we continue to find a similar story for benefits distribution planning and conservancy characteristics.

At first-glance, this positive relationship between baseline scores and number of trainings received seems counter-intuitive: according to ARD, one of the important criteria for assigning a training to a conservancy was that the conservancy had to score below a 2 (on a scale of 0-3). However, conservancies that scored "2" may not necessarily receive fewer trainings that conservancies that score "1". For example, the average number of institutional trainings received by conservancies that received an ARD score on democracy and representation between 1 and 2 (medium range) was higher than those that received an ARD score between 0 and 1 (in the low range) or between 2 and 3 (high range).

In addition, it is difficult to completely model CDSS's decision-making process when assigning governance trainings and technical assistance. The decision-making criteria for the training dosage received by each conservancy is not well-defined—there are variations between recommendations made by ARD and CDSS. While ARD baseline scores were used as a guide, CDSS also made decisions on how to provide trainings based on relevance and its own conservancy needs assessment. Most strikingly, CDSS notes that "the original ARD assessment aimed at bringing all conservancies to a certain level of competency (i.e. if a conservancy was already holding AGMs with quorum etc. they would not have been included for AGM training), while the CDSS assessment focused on where any further assistance was required."[24] This indicates that not all courses were treated as "remedial"—meaning, more courses were not necessarily provided to poorer performing conservancies. CDSS notes that this variation likely increased the number of trainings and assistance provided to conservancies as a whole. Other reasons for variation include:

a. Change in staff or management team as a result of community elections
b. Conservancies prioritizing some courses over others e.g. where there is no JV planned, reducing the technical assistance requested in this area in preference for greater technical assistance around institutional issues
c. No previous consultation as some training and technical assistance modules were added post the ARD assessment
d. Training or interventions that have taken place in 2010 reducing the need for some tasks[25]

To the last point, the evaluation team was unable to secure data around the trainings provided prior to 2011. Furthermore, the data available around differences in CDSS's decision making process versus ARD's was not conducive to be incorporated in the quantitative analysis. As ARD noted, "the needs of individual conservancies could [have] changed between the time of the assessment and the time when the MCA-N Conservancy Support Program will be implemented"[26]. While the number of trainings that ARD recommended at baseline may be negatively correlated with lower ARD scores at baseline, some of those trainings were provided prior to when data was available in 2011. For example, CDSS notes that some conservancies no longer required certain types of governance trainings because a service provider

[24] MCA-Namibia Conservancy Needs Assessment: Assistance Packages Report, p. 6. 2010.
[25] *ibid*
[26] *ibid*

had already been supporting activities for the conservancy between the ARD assessment and 2011. If conservancies that received lower baseline scores were more likely to have some of their training needs met between 2009 and 2011, this could also contribute to the positive correlation we see between ARD scores and number of trainings for the 2011-2013 time period.

Table 18a: The influence of training and governance of the conservancy's overall Gini Coefficient

Variable: Overall Gini Coefficient, Baseline (2010-2011) and Endline (2013-2014)					
	(1)	(2)	(3)	(4)	(5)
PV_total_train	-0.072***				
	(0.023)				
PV_total_institutional		-0.052			
		(0.040)			
PV_ta_inst_all			-0.0054***		
			(0.0018)		
PV_ta_inst_gov				-0.0097***	
				(0.0032)	
PV_total_distpbs					-0.16
					(0.25)
CDSS Governance	0.12***	0.069**	0.14***	0.15***	0.071*
	(0.027)	(0.026)	(0.037)	(0.037)	(0.036)
Number of members	-6.26***	-4.96***	-4.95***	-4.06***	-3.33***
	(1.37)	(1.42)	(0.89)	(0.78)	(0.81)
Conservancy area	3.22	-1.90	6.05	5.00	-3.15
	(2.83)	(1.88)	(3.80)	(3.41)	(2.33)
Conservancy age	-0.023*	-0.0029	-0.0058	-0.012	0.0034
	(0.012)	(0.0091)	(0.0090)	(0.0092)	(0.0099)
Constant	0.90***	0.51**	0.27*	0.086	0.15
	(0.22)	(0.19)	(0.15)	(0.19)	(0.31)
Observations	24	24	24	24	24
R-squared	0.809	0.736	0.802	0.812	0.723

See notes at the end of Panel C.

Table 18a through Table 18c and Table 19a through Table 19c, which contain the same information, provide the estimation results for Equation 1, the former set organized by type of Gini Coefficient and the latter set organized by type of training or TA. Within a given group of Gini-training/TA combinations, the alternative specifications utilized different propsensity variables with the purpose of assessing the robustness of results.

Consider, first, Table 18a, which refers to the overall Gini Coefficient. Here we find that the conservancy trainings (number of institutional/governance trainings, number of days of technical assistance on institutional and governance topics, number of total benefits distribution plan trainings) have negative conditional correlation with the overall Gini coefficient, with the effects of all but training in distribution planning and institutional strengthening being statistically significant at the one-percent level. This suggests that an increase in training or TA is associated with a decrease (improvement) in the Gini coefficient – that is, an increase in equality of the distribution benefits among households.

Table 18b: The influence of training and governance of the conservancy's In-Kind Gini Coefficient

Variable: In-Kind Gini Coefficient, Baseline (2010-2011) and Endline (2013-2014)					
In-Kind Gini Coefficient	(6)	(7)	(8)	(9)	(10)
PV_total_train	-0.11***				
	(0.020)				
PV_total_institutional		-0.11*			
		(0.059)			
PV_ta_inst_all			-0.0078***		
			(0.0016)		
PV_ta_inst_gov				-0.014***	
				(0.0020)	
PV_total_distpbs					-0.63
					(0.41)
CDSS Governance	0.17***	0.11***	0.20***	0.21***	0.14**
	(0.024)	(0.034)	(0.029)	(0.024)	(0.058)
Number of members	-7.01***	-5.52***	-5.01***	-3.80***	-2.08*
	(1.16)	(1.66)	(0.66)	(0.60)	(1.05)
Conservancy area	7.59***	1.77	11.3***	9.38***	1.35
	(2.37)	(3.19)	(3.35)	(2.11)	(3.93)
Conservancy age	-0.020**	0.015	0.0057	-0.0049	0.034*
	(0.0098)	(0.012)	(0.0087)	(0.0075)	(0.017)
Constant	0.82***	0.19	-0.100	-0.32**	-0.81
	(0.22)	(0.28)	(0.13)	(0.14)	(0.56)
Observations	25	25	25	25	25
R-squared	0.865	0.704	0.850	0.882	0.691

See notes at the end of Panel C.

These regressions also show that the conservancy's governance score has a significant, though positive conditional correlation with the overall Gini coefficient, suggesting that an increase in governance is associated with an increase in the Gini coefficient – or in other words, an increase in inequality in the distribution of benefits among households. This effect is consistent and robust to the inclusion of several types of trainings as control variables.[27] Given this counterintuitive result we carried out a number of additional tests, especially with regard to outliers and the data quality of the dependent variable. No data issues were found. Likewise, one should note that though sampling was designed to achieve statistical significance at the level of the population and not the conservancy, calculation of the Gini Coefficients involved a considerable amount of household observations. Thus, there would have had to be a substantial systematic bias from somewhere *across all* conservancy reporting for the governance coefficient to consistently have an incorrect sign across several specifications.

[27] Though not shown, we also ran analogous models containing instrumental variables for governance but training or TA uninstrumented. Results are the same: an increase in CDSS governance *worsens* the benefits distribution.

Finally, Table 18a suggests that larger conservancies display greater overall benefits equality than smaller conservancies. This finding was consistent and statistically significant at the one-percent level across all specifications.

Table 18c: The influence of training and governance of the conservancy's Meat Gini Coefficient

Variable: Meat Gini Coefficient, Baseline (2010-2011) and Endline (2013-2014)					
Meat Gini Coefficient	(11)	(12)	(13)	(14)	(15)
PV_total_train	-0.018				
	(0.036)				
PV_total_institutional		0.078***			
		(0.023)			
PV_ta_inst_all			0.00053		
			(0.0025)		
PV_ta_inst_gov				-0.0019	
				(0.0043)	
PV_total_distpbs					0.27
					(0.28)
CDSS Governance	0.0087	-0.024	-0.015	0.011	-0.029
	(0.044)	(0.028)	(0.047)	(0.052)	(0.039)
Number of members	-3.70**	-0.64	-2.82*	-3.11**	-3.07**
	(1.68)	(1.53)	(1.38)	(1.17)	(1.16)
Conservancy area	-0.81	-6.13***	-3.69	-0.88	-4.45
	(3.44)	(1.37)	(4.64)	(3.87)	(2.69)
Conservancy age	0.0014	0.014	0.0083	0.0050	0.0038
	(0.017)	(0.0095)	(0.011)	(0.012)	(0.011)
Constant	0.60*	0.099	0.44**	0.40*	0.66**
	(0.33)	(0.23)	(0.19)	(0.22)	(0.31)
Observations	24	24	24	24	24
R-squared	0.548	0.615	0.537	0.543	0.556

Notes: OLS regressions with robust standard errors (in parentheses). Data for the Gini Coefficients are from the NORC Conservancy Household Survey (2011 and 2014). All other data is from the CDSS Monitoring database (2010-2013). (a) See the panels of Table 17 for the estimated equations whose predictions are used here as propensity variables.

Turning to the In-Kind Gini Coefficient in Table 18b, we find the identical pattern of results as for the overall Gini. In addition, we also see that conservancies occupying larger geographic areas tend to have less benefits equality, though at the same time there is contradictory evidence on the effect of conservancy age on equality.

Lastly, in Table 18c we look at the effect of training and TA on the degree of equality in the distribution of meat. Here we find the weaknest statistical associations, though the greater the number of conservancy members the greater is meat distribution equality. Now, however, CDSS governance has no influence nor do any of the trainings or TA with the exception of institutional capacity building – but in the "wrong" direction: more TA has led to a decline in equality.

We should reiterate that the counterintuitive results for CDSS governance scores (and for institutional capacity building TA in the case of meat) cannot be attributed to reverse causality, that is, cannot be due

to poor Gini Coefficient scores attracting CDSS to increase its services. This is because the same signs remain when the governance score is replaced with a propensity score or an instrumental variable.

Table 19a: The influence of total & institutional training on Overall, In-Kind, & Meat Gini Coefficients

Baseline (2010-2011) and Endline (2013-2014)	(1) Gini	(2) Gini in kind	(3) Gini meat	(4) Gini	(5) Gini in kind	(6) Gini meat
PV_total_train[(a)]	-0.072***	-0.11***	-0.018			
	(0.023)	(0.020)	(0.036)			
PV_total_institutional[(a)]				-0.052	-0.11*	0.078***
				(0.040)	(0.059)	(0.023)
CDSS Governance	0.12***	0.17***	0.0087	0.069**	0.11***	-0.024
	(0.027)	(0.024)	(0.044)	(0.026)	(0.034)	(0.028)
Number of members	-6.26***	-7.01***	-3.70**	-4.96***	-5.52***	-0.64
	(1.37)	(1.16)	(1.68)	(1.42)	(1.66)	(1.53)
Conservancy area	3.22	7.59***	-0.81	-1.90	1.77	-6.13***
	(2.83)	(2.37)	(3.44)	(1.88)	(3.19)	(1.37)
Conservancy age	-0.023*	-0.020**	0.0014	-0.0029	0.015	0.014
	(0.012)	(0.0098)	(0.017)	(0.0091)	(0.012)	(0.0095)
Constant	0.90***	0.82***	0.60*	0.51**	0.19	0.099
	(0.22)	(0.22)	(0.33)	(0.19)	(0.28)	(0.23)
Observations	24	25	24	24	25	24
R-squared	0.809	0.865	0.548	0.736	0.704	0.615

See notes at the end of Panel C.

Table 19b: Influence of all TA & of governance TA training on Overall, In-Kind, & Meat Gini Coefficients

Variables	(7) Gini	(8) Gini in-kind	(9) Gini meat	(10) Gini	(11) Gini in-kind	(12) Gini meat
PV_ta_inst_all[(a)]	-0.0054***	-0.0078***	0.00053			
	(0.0018)	(0.0016)	(0.0025)			
PV_ta_inst_gov[(a)]				-0.0097***	-0.014***	-0.0019
				(0.0032)	(0.0020)	(0.0043)
CDSS Governance	0.14***	0.20***	-0.015	0.15***	0.21***	0.011
	(0.037)	(0.029)	(0.047)	(0.037)	(0.024)	(0.052)
Number of members	-4.95***	-5.01***	-2.82*	-4.06***	-3.80***	-3.11**
	(0.89)	(0.66)	(1.38)	(0.78)	(0.60)	(1.17)
Conservancy area	6.05	11.3***	-3.69	5.00	9.38***	-0.88
	(3.80)	(3.35)	(4.64)	(3.41)	(2.11)	(3.87)
Conservancy age	-0.0058	0.0057	0.0083	-0.012	-0.0049	0.0050
	(0.0090)	(0.0087)	(0.011)	(0.0092)	(0.0075)	(0.012)
Constant	0.27*	-0.100	0.44**	0.086	-0.32**	0.40*
	(0.15)	(0.13)	(0.19)	(0.19)	(0.14)	(0.22)
Observations	24	25	24	24	25	24
R-squared	0.802	0.850	0.537	0.812	0.882	0.543

See notes at the end of Panel C.

Table 19c: The influence of benefits planning training on Overall, In-Kind, & Meat Gini Coefficients

Variables	(13) Gini	(14) Gini in kind	(15) Gini meat
PV_total_distpbs[(a)]	-0.16	-0.63	0.27
	(0.25)	(0.41)	(0.28)
CDSS Governance	0.071*	0.14**	-0.029
	(0.036)	(0.058)	(0.039)
Number of members	-3.33***	-2.08*	-3.07**
	(0.81)	(1.05)	(1.16)
Conservancy area	-3.15	1.35	-4.45
	(2.33)	(3.93)	(2.69)
Conservancy age	0.0034	0.034*	0.0038
	(0.0099)	(0.017)	(0.011)
Constant	0.15	-0.81	0.66**
	(0.31)	(0.56)	(0.31)
Observations	24	25	24
R-squared	0.723	0.691	0.556

Notes: OLS regressions with robust standard errors (in parentheses). Data for the Gini Coefficients are from the NORC Conservancy Household Survey (2011 and 2014). All other data is from the CDSS Monitoring database (2010-2013). (a) See the panels of Table 17 for the estimated equations whose predictions are used here as propensity variables.

Discussion of Key Findings

Management committees perceive improvements in governance; conservancy members do not.
Key constraints to governance identified in the qualitative analysis include lack of accountability, insufficient information sharing, insufficient capacity, lack of member awareness of rights, and lack of respect for quorums at AGMs. A divide emerges between management and non-management members' perceptions of governance: while those on conservancy management committees generally believe that governance has improved, non-management members do not always agree with the committee members' assertion. Management committee members and conservation leaders have also noted that trainings had a positive impact on governance, especially with regards financial accounting and reporting.

Unfortunately, governance is a quantitatively difficult concept to capture. Both CDSS governance measures, as well as measures from the CS Household Survey, have increased between baseline and endline. However, the data is not available to measure whether perceptions of governance differ by management and non-management members.

This divide in opinion between management and non-management also exists with regards to the equitable distribution of benefits—with management committee members noting improvements in the distribution of both cash and in-kind benefits, and less consensus amongst conservancy members on equitability. Quantitatively, we do see a divide in perceptions at endline between members of management committees and non-members: across every benefits category where there were both management and non-management respondents, we find a statistically significant difference between perceptions of fairness, with management committee members more likely to say that benefits are fairly distributed than non-members.

Training and governance scores at baseline are positively correlated: lack of systemized training data between 2009-2011 constrains our understanding of why.

Quantitative findings display a fairly strong positive correlation between baseline governance scores and intervention dosage: specifically, conservancies with higher ARD scores received more trainings and technical assistance in total, as well as in governance-specific trainings. At first-glance, this relationship seems counter-intuitive. However, if conservancies that received lower baseline scores were more likely to have some of their training needs met between 2009 and 2011, this could also contribute to the positive correlation we see between ARD scores and number of trainings for the 2011-2013 time period.

Increased training and technical assistance are associated with a more equitable distribution of benefits.

In most cases, we see a negative relationship between trainings or technical assistance and the Gini coefficient—that is, more training and technical assistance is associated with more equality. The notable exception is in the meat Gini coefficient, where the number of institutional trainings is associated with more inequality. It is unclear as to why these particular types of trainings are associated with higher meat Gini coefficients. As outlined previously, it could be that conservancies with higher Gini coefficients were more likely to receive institutional trainings between 2009 and 2011—data that is not available to the evaluation team. The count of institutional trainings also includes trainings across all governance topics. It could also be that those conservancies with lower meat Gini coefficients may have received greater amounts of institutional training in topics less likely to directly impact benefits distribution (e.g. public speaking classes).

The larger the area of the conservancy, the less equitable the benefits. The more members, the more equitable the distribution of in-kind benefits.

Interestingly, we find that size matters: the larger the number of registered members, the greater the overall benefits equality than smaller conservancies. This complements an assertion in the qualitative analysis that in-kind benefits leads to more equity in conservancies with more members. The quantitative analysis also found that the larger the geographic area of the conservancy, the smaller the overall benefits equality. This is also in line with the qualitative data indicating that those too far from conservancy headquarters felt a lack of control and accountability.

Increases CDSS governance scores are puzzlingly associated with an increase in inequality, even after correcting for potential endogeneity.

The lack of trainings data between 2009 and 2011 may threaten the validity of the predicted propensity variables and their ability to correct for reverse causality. The adjustments that CDSS made to its training plans between 2009 and 2011 may alter the reliability of the selection models, which were estimated using a variety of ARD baseline indicators. Though unlikely, counterintuitive results could be due to conservancies with more inequitable distribution procedures having attracted more services and trainings from CDSS.

It is also important to note that the Gini coefficients capture some, but not all forms, of benefits distribution. For example, public goods distribution (e.g., school buildings, electric fencing, water points for livestock) is not valued in the household survey and therefore not included in the Gini coefficients. Attempts to encourage conservancies to distribute benefits in the form of these public goods, which may be associated with a mark of higher governance, is not captured in the Gini coefficient. Qualitative findings demonstrate that the distribution of public goods in particular leads to greater perceptions of equality amongst the community.

4.2 Research Question: Is there an increase in conservancy-related employment as a result of the CS activities (including grants)? If so, how many new jobs are created and at what levels of employment? (RQ3)

- The number of JVs in a conservancy, along with the overall level of business activity in the conservancy, has a positive relationship with full-time employment.
- The number of SMEs in a conservancy seems to have little effect on full-time or part-time employment—but this may be due to low data quality.
- JVs are set up in conservancies where part-time employment is low.
- There is no detectable relationship between trainings/technical assistance and conservancy business. JV grants, however, have been noted as a key strength of the CS program – but at this time, there is not enough data available to validate these findings.

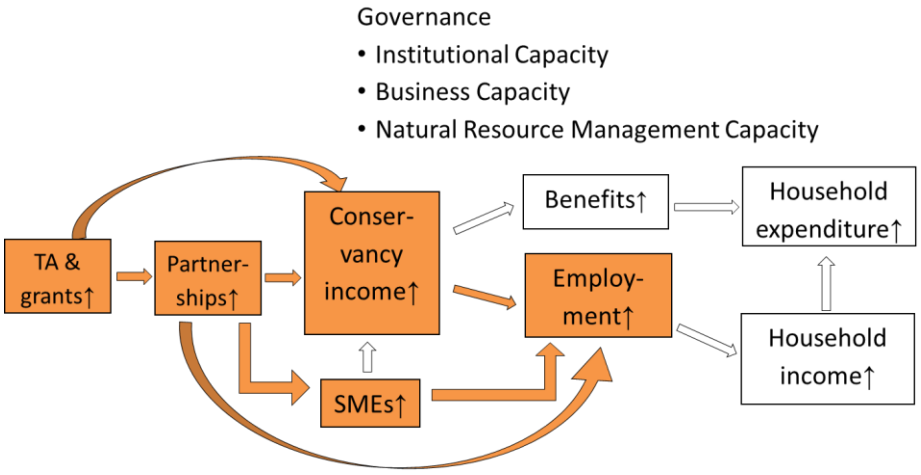
As demonstrated by Figure 3, a variety of MCA-N-interventions and conservancy characteristics influence levels of employment. In order to develop and maintain JVs as a source of conservancy revenue, MCA Namibia provided several types of assistance to conservancies. Grant funding through the Conservancy Development Support Grant Fund (CDSGF) was only provided to select conservancies, based on their management/governance capacity, technical experience with business and tourism enterprises, and the tourism potential of the conservancy. CDSS also provided technical assistance, including acting as legal advisor in structuring deals, leasehold arrangements, negotiating with joint venture partners, drafting contracts, and resolving disputes. They also provided trainings around basic business, joint venture development, tour guiding, tourism enterprises and products, and tourism awareness.

These interventions aim to increase the number and quality of JV partnerships and SMEs, which in turn could increase employment. Additional revenue from SMEs and JVs could increase conservancy income, which could also increase conservancy employment. It is also possible, however, that JV investment reacts to local conditions that at the same time stimulate employment from workers.

As a consequence of these complex relationships, our analysis tries to isolate each link between MCA-N interventions, partnerships, conservancy income, and ultimately employment. We analyze several relationships: the relationship between MCA-N interventions and partnerships, between MCA-N interventions and conservancy business (as proxied by conservancy income), between partnerships and employment, and between conservancy business and employment.

We start out by providing background on trends in training, TA, and grants over the evaluation period, trends in JV and SME presence by conservancy and region, as well as changes in employment. We then unpackage the relationship between SMEs and JVs and employment, and then the relationship between trainings, TA, and JVs, SMEs, and conservancy business respectively.

Figure 3: CS Program Logic: Do CS activities increase conservancy-related employment?



Quantitative Findings

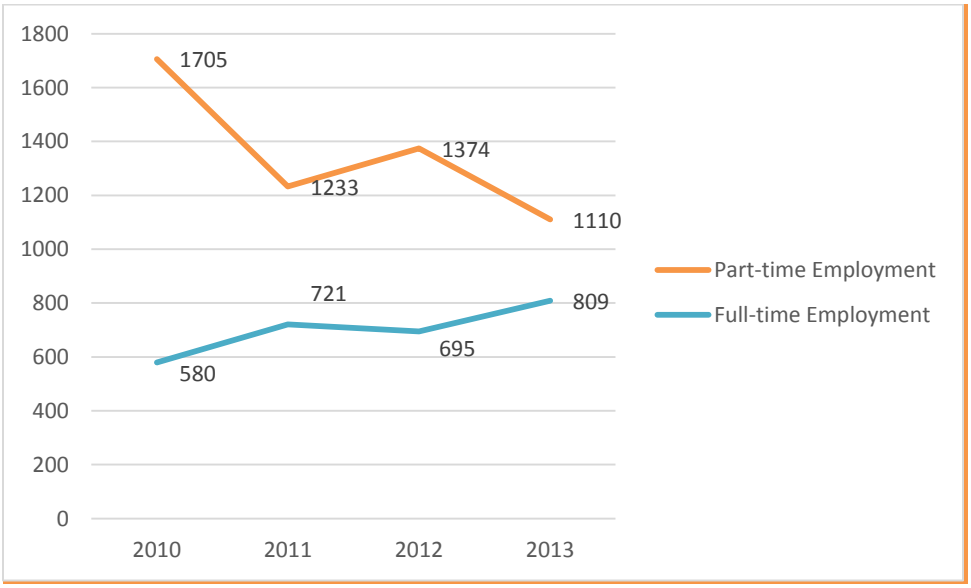
Background

We examine this question by focusing on tourism-related employment, which, for reasons that we will explain, can be divided into part-time (PT), or casual, and full-time (FT), or permanent, employment. Note that CDSS's full-time employment figure "excludes the approximately 129 short-term jobs created in building new joint venture lodges[28]." CDSS also notes that "it is difficult to define what constitutes a casual job and how long they last for".[29]

The total number of jobs in tourism for the years available is shown in Figure 4. When we account for size of conservancy (# of members), we find that the ratio for both PT and FT is in the 6-percent range but rises slowly between 2010 and 2012.[30]

[28] CDSS Final Report, 2014. page 25.
[29] *ibid*
[30] Note that the CDSS monitoring data on conservancy membership contains discrepancies so these ratios should be taken with a grain of salt.

Figure 4: Full-time (FT) and part-time (PT) tourism-related employment, 2010-2013



Source: CDSS monitoring database.

There are three main aspects to the intervention: training and technical assistance to conservancy management, grants to the conservancy and to the SMEs with which the conservancies are associated, and JV partnerships with the conservancies. The tables and figures below describe these aspects of the intervention in more detail.

Table 20 shows an increase in the average number of training a conservancy received in 2011 and 2013. Qualitative analysis suggests that types of trainings matter, especially those related to business management.

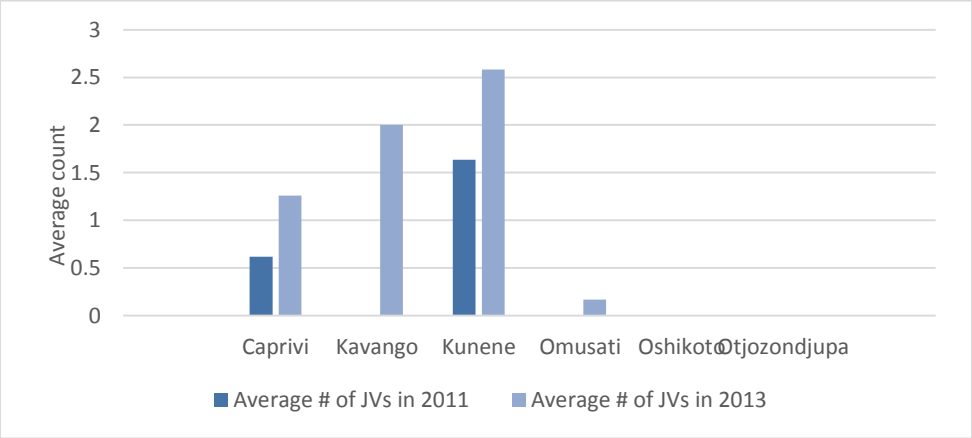
Table 20: Average Number of Trainings per Conservancy

Year	Mean # of Trainings per Conservancy
2011	0.4
2013	2.4

Source: CDSS Training Delivery Summaries.

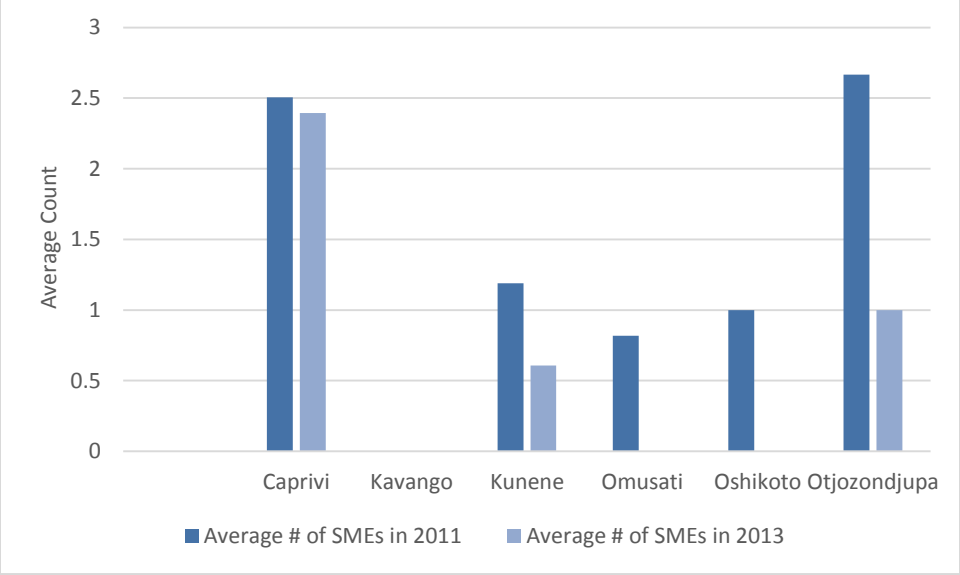
Figure 5 shows the mean number of JVs by conservancy from 2011 to 2013 for each region, while Figure 6 shows the number of SMEs from 2011 to 2013.

Figure 5: Average Number of JVs in Operation by Region



Source: 2013 CDSS Annual Report.

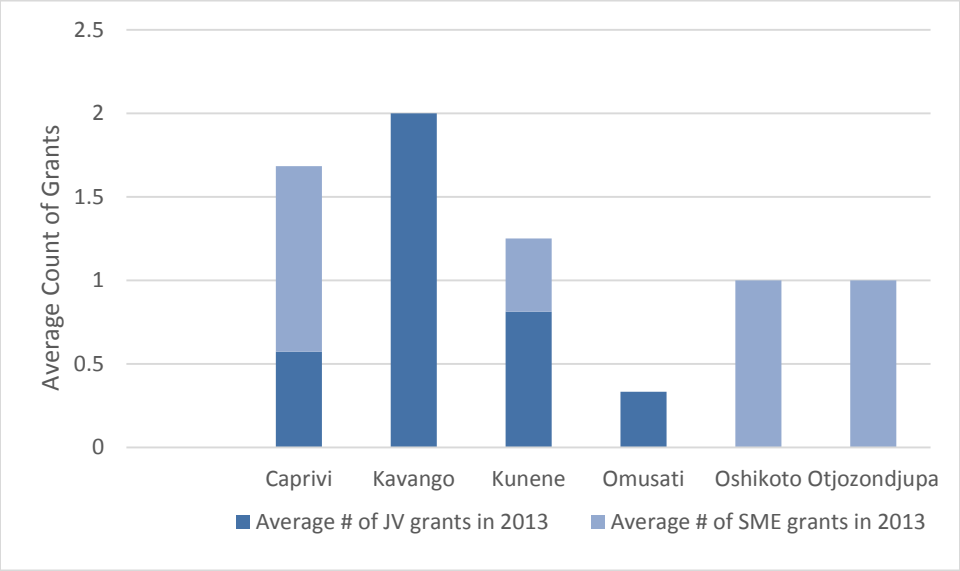
Figure 6: Number of SMEs in Operation, by Region



Source: 2013 CDSS Annual Report.

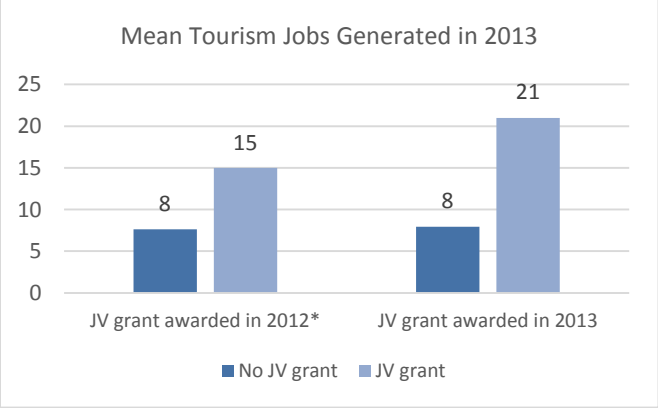
Concerning the basic facts about MCA-N grants received by conservancies, as shown in Figure 8 we found a statistically significant difference in the average number of total tourism jobs (FT+PT) generated by conservancies in 2013 that received JV grant funding in 2012 and those that did not. Moreover, conservancies that received a JV grant in 2013 had a higher number of jobs (and a higher ratio of jobs to conservancy members) than those that did not. We did not see this difference amongst conservancies that received SME grants and those that did not. These comparisons do not imply that grants raise employment since these are just correlations and are consistent with the hypothesis that grants are given to JVs that are likely to generate employment. The purpose of the multivariate analysis, below is to disentangle such potential endogeneity.

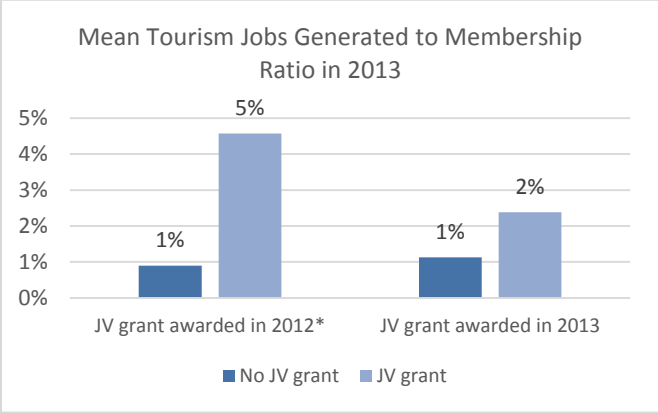
Figure 7: Average Number of JV and SME Grants, by Region



Source: 2013 CDSS Annual Report.

Figure 8: Tourism-related jobs generated by JV grant, 2010 and 2013





Note: Within-year differences are statistically significant at 5 percent.
Source: CDSS monitoring database.

Finally Table 21 shows the correlations among the outcome variables (jobs and revenues) and treatment variables (Number of SMEs, Annual Gross Revenue and Number of Trainings). We see that the number of SMEs and the number of trainings are both significantly positively correlated with the number of part-time jobs while annual gross revenue is significantly positively correlated with the number of full-time jobs. Furthermore, the correlation between annual gross revenue and the number of full-time jobs is quite strong (0.82).

Table 21: Correlation Matrix

	# of Part-time jobs	# of Full time jobs
# of SMEs	0.25*	0.48
Annual Gross Revenue	0.02	0.82*
# of Training to date	0.20*	-0.11

Source: 2013 CDSS Annual Report, 2010-2013. *=Statistically significant at the 5-percent level

SME and JV impacts on employment

We first explore the link between SMEs, JVs and employment.

Analytical Approach

As can be seen from the overall theory of change diagram, the influence of JV partnerships on conservancy employment comes from three channels: conservancies hire as a result of revenues received, JVs directly employ workers, and SMEs, as a result of JV activity, employ workers. However, it is also possible (though not illustrated in the diagram) that JV investment reacts to local conditions that at the same time stimulate employment of workers. If ignored, this latter effect could lead to spurious attribution of JV influence on employment. To prevent such "backdoor" causality (endogeneity), the analysis must take place in two steps: estimation of a selection equation (i.e., the decision process leading to the siting of a JV) and an attribution or outcome equation.

Analysis

Full-time employment. Table 22 provides a number of alternative specifications of the selection equation. Specification (2) is used to predict the number of JVs that initial conditions would warrant. The idea is that any employment not correlated to the former and correlated to the number of *actual* JVs added to the conservancy can be said to statistically significantly influence local employment – in this case full-time employment in tourism-related activities. In Specification (2), the interaction terms of year with initial levels of JVs captures the declining effect of such initial conditions on future JV investment decisions.

With the selection variable in hand to close backdoor endogeneity, let us apply this approach to full-time and then to part-time employment.

Table 23 provides a number of alternative specifications of the attribution equation. While the instrument proved necessary when looking at 2010-2012 data, as seen from the second row, our instrument to prevent endogeneity bias was insignificant and did not affect the magnitude or sign of JV influence.

Part-time employment. As in the case of full-time employment, we want to remove the possibility that our correlations were picking up a causal channel in which the availability of part-time workers encourages SME formation instead of the reverse, the actual linkage of interest. Such "endogeneity" could bias our estimates of effects. Table 24 provides a number of alternative specifications of the

selection equation. The dependent variable in these specifications is the number of SMEs for each conservancy and year. The idea is to use these equations to "predict" the number of SMEs one would expect given initial conditions. SME growth due to such conditions should not be attributed to the CDSS intervention. The models are estimated as OLS regressions with robust error correction. Note that these equations imply that lack of JVs leads to more part-time employment, as do higher levels of initial local skills (ARD_HK) in 2010 and a larger conservancy population.[31] Predicted values from each equation provide an alternative control we can use to close backdoor (or reverse) causation when we estimate the attribution equation.

Our attribution equations shown in Table 25 utilize the third and sixth specifications of the selection equation. These were chosen as representative of the models estimated and had better fits (adjusted for degrees of freedom). Besides the SME instrument, we also include the JV instrument in the attribution equations for similar reasons (see the above discussion on full-time employment). Based on the theory of change we expect both the number of JVs and downstream conservancy income (revenues) to influence part-time employment. Two alternative variables are used for the former: the number of JVs a conservancy has operating in each year and a dichotomous variable on whether *any* JVs are operating in the conservancy in each year. For reasons explained, below, we also include the amount of full-time employment. Finally, we specify a time trend (Year) to avoid generalized economic growth from leading to omitted-variable bias.

Findings

There are a considerable number of inferences that can be drawn from the above tables. Below are some of the key ones for full-time and part-time employment:

<u>*Full-time employment*</u>. Among the key findings for full-time employment is that JVs seem to raise full-time employment in a conservancy. Likewise, as predicted in the theory of change, an increase in conservancy revenues also increases full-time employment. However, once conservancy revenue is added to the equation, the number of JVs becomes unimportant. Similarly, once the age of the conservancy is accounted for, it appears that the quality of a conservancy's governance is unimportant.

One perhaps surprising finding from these regressions is that a change in the number of SMEs does not appear to influence the amount of *full*-time employment. One possibility is that SMEs generate *part*-time employment instead, a hypothesis we turn to next.

<u>*Part-time employment*</u>. Regardless of which of SME and JV propensity variables are used, the estimated models in Table 25 do not indicate a relationship between SMEs and part-time employment. The lack of statistical significance of either SME propensity control suggests that reverse causality was not manifest. As predicted by the theory of change, increasing conservancy income leads to increased part-time

[31] Note that that the strong statistical relationship between ARD_HK and number of SMEs bodes well for the conception of the CDSS intervention since it implies that raising skills, such as through training, should increase the number of SMEs.

employment. Not surprisingly, conservancies with a larger area tend to have more part-time employment, *ceteris paribus*.

It is important to note that when these specifications were run with just 2010-2012 data, we found a robust relationship between SMEs and part-time employment. These results are no longer robust once 2013 data are included. This is likely because 2013 data on SME presence was more incomplete; 11 out of the 25 conservancies that had data for 2012 did not have data for 2013. Of those, four conservancies had at least one SME in 2012.

The big surprise in the findings for part-time employment is that for several specifications the number JVs operating in a conservancy leads to *fewer* part-time jobs. In fact, once we use the JV propensity control to correct for endogeneity, the negative relationship between JVs and part-time jobs remains statistically significant (although this significance disappears when we remove the conservancy revenue variable). The statistical significance of the JV instrument may indicate that there is indeed reverse causality—with JVs being set up where part-time (but not necessarily full-time) employment is low.

Table 22: Poisson regression to close backdoor endogeneity of JV selection

Dependent variable: Total Number of JVs, 2010-2013				
Model	(1)	(2)	(3)	(4)
2010 Tourism management indicator[(a)]	0.733**		0.924***	0.723***
	(0.314)		(0.357)	(0.271)
2010 Tourism management x Year 2011			-0.0477	
			(0.0811)	
2010 Tourism management x Year 2012			-0.198	
			(0.214)	
2010 Tourism management x Year 2013			0.00779	
			(0.287)	
2010 Governance indicator [(b)]	-0.245**			
	(0.107)			
Time trend	0.217***			0.211***
	(0.0613)			(0.0597)
Population		-11.1e-05		
		(7.17e-05)		
Year 2011 dummy		0.203	0.129	
		(0.169)	(0.164)	
Year 2012 dummy		0.912***	0.638*	
		(0.243)	(0.368)	
Year 2013 dummy		1.297***	0.577	
		(0.253)	(0.514)	
Number of JVs, 2010		0.739***		
		(0.0743)		
2010 JV x Year 2011		-0.0568		
		(0.0468)		
2010 JV x Year 2012		-0.218***		
		(0.0807)		
2010 JV x Year 2013		-0.291***		
		(0.101)		
Region 2				0.418
				(0.450)
Region 3				0.119
				(0.335)
Region 4				0.567
				(0.368)
Region 5				-16.56***
				(1.050)
Region 6				-16.73***
				(1.050)
Region 7				-16.75***
				(0.774)
Constant	-0.537	-1.186***	-1.240*	-1.430***
	(0.747)	(0.248)	(0.647)	(0.515)
Observations	104	117	106	106

Notes: (a) ARD Identification & Management of Tourism Enterprises & Systems indicator. (b) CDSS governance performance rating. * p<0.10, ** p<0.05, *** p<0.01.
Sources: CDSS database (2010-2013) except for ARD indicator, which is from ARD (2011).

Table 23: Influence of JVs and SMEs on conservancy full-time employment

Dependent Variable: Full-Time Employment, 2010-2013									
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
JVs To Date	5.157*** (1.860)	5.801*** (1.981)	5.227*** (1.951)	5.622*** (2.105)	5.809*** (2.056)	5.515*** (1.989)	5.982*** (1.945)	5.497*** (1.903)	2.414 (2.466)
Predicted number of JVs[(a)]		-1.067 (2.328)	-2.272 (2.068)	-1.733 (2.121)	-1.995 (2.268)	-2.411 (2.257)	-1.587 (2.338)	-2.291 (2.174)	-1.831 (1.851)
Conservancy Age			1.624 (0.992)			0.811 (1.048)		1.264 (1.049)	
CDSS governance rating				1.983 (1.351)	1.967 (1.303)	1.688 (1.339)			
# of SMEs					2.945 (1.881)	2.713 (1.841)	3.133 (2.001)	2.744 (1.928)	
Conservancy revenue									0.0127*** (0.0037)
Constant	19.56*** (4.293)	20.10*** (4.431)	6.156 (10.54)	11.33 (7.565)	8.106 (6.714)	2.544 (10.87)	16.85*** (4.329)	6.182 (10.73)	8.080** (3.597)
Observations	112	111	111	111	109	109	109	109	111

See notes at the end of the table.

Table 23 Influence of JVs and SMEs on conservancy full-time employment (continued)

Model	(10)	(11)	(12)	(13)	(14)	(15)	(16)
JVs To Date	2.213	2.316	1.987	2.445	2.246	2.313	1.877
	(2.268)	(2.504)	(2.238)	(2.428)	(2.238)	(2.498)	(2.267)
Predicted number of JVs[(a)]	-1.687	-1.216	-0.874	-1.846	-1.701	-1.187	-0.787
	(1.661)	(2.069)	(1.899)	(1.823)	(1.647)	(2.114)	(1.985)
Conservancy Age		-1.412	-1.798*			-1.460	-1.882*
		(0.972)	(0.999)			(0.968)	(0.977)
CDSS governance rating				0.187	0.180	0.127	-0.0465
				(1.231)	(1.236)	(1.154)	(1.126)
# of SMEs	2.546		3.007*		2.544		3.054*
	(1.620)		(1.709)		(1.622)		(1.787)
Conservancy revenue	0.0120***	0.0149***	0.0145***	0.0126***	0.0119***	0.0150***	0.0147***
	(0.0035)	(0.0040)	(0.0037)	(0.0038)	(0.0036)	(0.0041)	(0.0038)
Constant	6.112*	18.57**	19.41**	7.328	5.364	18.25*	20.07**
	(3.184)	(8.015)	(8.153)	(6.428)	(5.826)	(9.652)	(10.10)
Obs.	109	111	109	111	109	111	109

Notes: The dependent variable in all regressions is full-time employment. Random-effects GLS regression with residuals clustered at the conservancy level. p-values are in parentheses. * p<0.10, ** p<0.05, *** p<0.01. (a) This variable is the prediction from a Poisson regression (from Table 22), whose purpose is to close any backdoor endogeneity.
Source of data: CDSS database, 2010-2012.

Table 24: OLS regressions to close backdoor endogeneity of SME selection

Dependent Variable: Part-time Employment, 2010-2013							
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ARD_HK	1.449***	1.339***	1.008***	0.983***	1.247***	0.777***	1.256***
	(0.193)	(0.198)	(0.275)	(0.220)	(0.243)	(0.213)	(0.243)
Pop.	0.103**	0.137***	0.192***	0.144**	0.140**	0.237***	0.138**
(1000s)	(0.0483)	(0.0448)	(0.0528)	(0.0681)	(0.0611)	(0.0661)	(0.0620)
Number of JVs (2010)		0.460**		0.544*	0.474*	0.558**	0.443
		(0.213)		(0.276)	(0.255)	(0.259)	(0.271)
Reg2 x ARD_HK			0.612			2.320**	
			(0.474)			(1.014)	
Reg3 x ARD_HK			-1.142***			-0.407	
			(0.397)			(0.536)	
Reg4 x ARD_HK[(b)]			0.312			0.686	
			(0.349)			(0.529)	
Reg6 x ARD_HK			-1.252***				
			(0.448)				
Reg7 x ARD_HK			0.0568			0.0398	
			(0.288)			(0.483)	
Year 2011			0	0.0258			-0.0177
			(0.337)	(0.274)			(0.204)
Year 2012			-0.442	-0.639			0.279
			(0.486)	(0.516)			(0.388)
Year 2013			-0.0303	-0.206			-0.0595
			(0.586)	(0.637)			(0.485)
2011 x ARD_HK			-0	-0.0487			
			(0.315)	(0.239)			
2012 x ARD_HK			0.823	0.896			
			(0.518)	(0.572)			
2013 x ARD_HK			0.152	0.148			
			(0.605)	(0.654)			
Region 2				0.0967	0.114	-2.336***	0.107
				(0.503)	(0.493)	(0.829)	(0.509)
Region 5[(a)]				-0.428	-0.410	-0.558*	-0.472
				(0.383)	(0.385)	(0.318)	(0.402)
Region 6				-0.0867	-0.0262	-0.594	-0.0680
				(0.413)	(0.427)	(0.425)	(0.416)
Region 7				-1.003**	-0.983***	-1.168***	-1.055**
				(0.448)	(0.357)	(0.337)	(0.434)
Year					0.0420		
					(0.142)		
Constant	-0.0986	-0.325*	-0.105	-0.0578	-0.331	-0.0384	-0.263
	(0.176)	(0.176)	(0.269)	(0.436)	(0.583)	(0.335)	(0.474)
Adjusted R^2	0.421	0.441	0.516	0.509	0.473	0.550	0.480
Obs.	85	85	85	85	85	85	85

Notes: OLS regression with robust residuals. p-values in parentheses. * p<0.10, ** p<0.05, *** p<0.01. (a) For space considerations, region dummies 3 and 4 are not shown since they were statistically insignificant. (b) Region 5 x ARD_HK was omitted.

Source: CDSS database, 2010-2012.

Table 25: Influence of JVs and SMEs on conservancy part-time employment

Dependent variable: Part-time Employment, 2010-2013									
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
# of operational SMEs	4.559	7.301*	3.063	6.906	6.240	8.646**	6.775	8.584	4.339
	(6.692)	(4.341)	(7.802)	(4.471)	(6.993)	(4.259)	(7.019)	(6.637)	(7.337)
JVs to date	-27.84***	-23.16***	-27.14***	-22.26***			-26.95***	-28.11***	-45.78***
	(9.001)	(8.438)	(8.679)	(8.017)			(9.190)	(9.655)	(16.71)
Conservancy revenue	0.0283**		0.0335**		0.0332***		0.0397**	0.0400**	0.0355**
	(0.0128)		(0.0165)		(0.0128)		(0.0195)	(0.0196)	(0.0162)
Conservancy area	0.0179**	0.0193*	0.0177**	0.0193*	0.0161**	0.0181*	0.0178**	0.0177**	0.0171**
	(0.00787)	(0.0107)	(0.00764)	(0.0109)	(0.00697)	(0.0105)	(0.00846)	(0.00837)	(0.00725)
Tourism enterprises FT jobs		0.691*		0.733*		0.824**			
		(0.358)		(0.390)		(0.387)			
Year			-12.51	-5.684		-2.851	-15.03	-14.43	-14.09
			(9.953)	(5.984)		(5.889)	(10.87)	(10.54)	(10.44)
No-JVs dummy					-78.76***	-59.62***			
					(22.73)	(20.64)			
SME propensity (3)[(a)]								-15.30	
								(12.70)	
SME propensity (6)[(a)]									-18.61
									(12.16)
JV propensity (2)[(b)]									
JV propensity (4)[(b)]									
Constant	-6.787	2.256	14.73	12.75	1.784	13.97	29.14	31.65	14.01
	(18.35)	(17.03)	(15.98)	(16.17)	(18.05)	(17.99)	(20.72)	(20.91)	(16.54)
Observations	86	84	86	84	86	84	79	79	86

See notes at the end of the table

Table 25: Influence of JVs and SMEs on conservancy part-time employment (continued)

Model	(10)	(11)	(12)	(13)	(14)	(15)	(16)
# of operational SMEs	3.364 (7.781)	4.607 (6.404)	7.334 (6.653)	7.046 (6.172)	3.364 (7.781)	1.925 (8.908)	2.248 (8.611)
JVs to date	-17.90** (8.979)	-47.29*** (17.24)	-18.04* (9.435)	-46.53*** (17.93)	-17.90** (8.979)	-14.65* (8.885)	-13.87 (8.807)
Conservancy revenue	0.0350** (0.0164)	0.0412** (0.0188)	0.0379** (0.0188)	0.0420** (0.0193)	0.0350** (0.0164)		
Conservancy area	0.0161** (0.00717)	0.0167** (0.00781)	0.0169** (0.00813)	0.0168** (0.00788)	0.0161** (0.00717)	0.0173* (0.0105)	0.0175 (0.0106)
Tourism enter-prises FT jobs						0.867* (0.452)	0.862* (0.445)
Year	-11.53 (11.22)	-17.97 (11.71)	-11.67 (11.20)	-17.31 (11.47)	-11.53 (11.22)	-6.450 (8.005)	-6.311 (7.828)
No-JVs dummy							
SME propensity (3)[(a)]			-7.845 (11.07)	-12.75 (12.63)			5.539 (10.53)
SME propensity (6)[(a)]					-13.90 (11.29)		
JV propensity (2)[(b)]	18.90* (11.34)		19.98* (12.08)		18.72 (12.54)		
JV propensity (4)[(b)]		-27.21*** (10.10)		-23.75** (10.20)		-27.21*** (10.10)	-23.49** (9.977)
Constant	34.61* (19.62)	27.28 (21.42)	39.22* (20.44)	30.88 (21.83)	34.61* (19.62)	32.90* (18.68)	33.24* (18.84)
N	79	79	79	79	79	77	77

Notes: Random-effects GLS regression with residuals clustered at the conservancy level. p-values are in parentheses. * p<0.10, ** p<0.05, *** p<0.01. (a) Predictions from regressions (column in parentheses, Table 24) to close any backdoor endogeneity. (b) Ditto but from Poisson regressions in Table 22).

Source: CDSS database, 2010-2012.

Impacts of training on employment

Next we explore the link between the amount of training received and employment.

Analytical Approach

As seen in the theory of change, training and TA affect employment indirectly via its impacts on conservancy business and on partnerships. Above, we have already shown the degree to which the latter links exist, i.e., those between partnerships (SMEs, JVs) and employment and between conservancy business (as proxied by Annual Gross Revenue) and employment. We now examine the first links, i.e., between training/TA and partnerships and training/TA and conservancy business. We examine whether there is evidence that increases in conservancy business follow additional training/TA. Note that this link is undoubtedly simultaneous: conservancies will also likely want or need additional assistance as their businesses flourish and number of JVs under their auspices rises.

Separately, we briefly also consider the degree to which technical assistance to conservancy management on SME development has led to increases in the number of SMEs.

Analysis

Conservancy business. We consider revenues received by the conservancy as an outcome measure of conservancy business (columns 2 to 4, Table 26).

We construct lagged variables of training and TA as well as use totals (number and days, respectively) received over the evaluation period (i.e., from 2010). The variables, Year and ARD 2010 conservancy capacity and skill indicator are included to control for exogenous growth over time (e.g., due to inflation) and conservancy initial capacity and skill levels prior to the MCA-N intervention.[32] GLS regression (with residuals clustered at the conservancy level) is used for estimation over the period 2011 and 2012.[33] Finally, while Regions 2 through 4 (5) tended to manifest fixed effects twice (four-times) the size of the others, due to paucity of sample size only Region 5 was regularly statistically significant. Thus, only it was included in our specifications.

Partnerships. We also consider two measures of partnership formation, number of JVs and increase in JV investment (columns 7 to 14, Table 26). These are probit models where the dependent variable is a zero-one value indicating whether the JV made an investment in 2013.[34] These specifications consider two types of training and TA, including cumulative training received on all topics by 2013, cumulative

[32] The next draft of this report will repeat the analysis using real conservancy income (i.e., deflated by a 2010 price index).

[33] Data was only available from 2010 to 2012 so the inclusion of one-period-lagged variables period just two years to be analyzed.

[34] In fact, there was very little investment recorded prior to 2012 and none recorded prior to 2011.

training received in institutional strengthening by 2013. Other types of training were tested, but no effects were found. To account for changes in investment simply due to the addition of JVs, a variable is included on the number of JVs in a conservancy by 2013. Various combinations of three ARD 2010 institutional indicators were included to control for varying starting levels of such capacity: (i) Human Capacity and Skills, (ii) Identification and Management of Tourism Enterprises and Systems, and (iii) Financial & Institutional Governance of Resources (composite indicator). Finally, conservancy area and population are included to prevent scale effects from spuriously influencing the relationships of interest.

Impact on SME formation. Here, since the results were consistent, we only show one specification, though others were tested. The outcome measure (dependent variable) is the total number of SMEs attributed to CDSS associated with each conservancy in each year. Contemporaneous and one-period-lagged measures of CDSS TA (in total days provided) are included, with the expectation that prior levels of TA would be more influential since it requires practice to bear fruit. As is the case for conservancy business models, the estimation was over the period 2011-2013.

Findings

Impact on conservancy business. As we see, the more JVs a conservancy has the higher is its conservancy income. TA on business promotion seems to have a positive impact on the level of conservancy income. While TA show a positive impact, the relationship between the number of trainings provided to conservancies and the conservancy revenue is negative. This is likely due to insufficient closure of reverse causation; no selection equation was utilized for these relationships. Not surprisingly, on the other hand, is the uniformly strong influence of the initial (2010) level of human capacity and skill on a conservancy's 2013 income and business performance measures: an increase by one on ARD's measure is associated with an increase of around NAD 600,000 in conservancy income. The true impacts from training may require a longer period of practice for the detection of effects from training effort.

Impact on partnerships. As in the case of conservancy business, the number of JVs in a conservancy has a statistically significant effect on JV investment in 2013, until trainings and technical assistance are accounted for. This non-result may be because of the large variances resulting from the very small number of conservancies experiencing JV investment. The cumulative amount of training on all topics combined does not. Finally, we find that prior levels of governance or business performance (as measured by the associated CDSS indicator) have no detectable effect on JV investment in 2013.

Impact on SME formation. With data for 2010 to 2012 only (the original data CDSS provided) we find that both contemporaneous and one-year-lagged TA on SME development have a statistically significant positive effect on the number of SMEs. However, this finding disappears with the inclusion of data for 2013. This lack of effect also held for other types of training (e.g., "business basics") that were tested. Conceivably, future analysis would want to understand what happened to the relationship in 2013.

Impacts of grants on employment

Unfortunately the conservancy-level monitoring data had too few observations over the evaluation period to conduct meaningful statistical analysis. Please refer to the qualitative subsection for some discussion of this relationship.

Table 26: Influence of training and TA on conservancy income, conservancy business management, and JV investment

Years: 2010-2013	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Dependent Variable:	No. SMEs	Conservancy income			CDSS Business Perf.		Likelihood of a JV investment in 2013							
Lagged TA for SME development	0.00364													
	(0.0126)													
SME TA (total days)	0.0255													
	(0.0252)													
Number of JVs to date	0.482***	133.2	182.6**	171.2**	0.899***	0.946***	0.385*	0.448*	0.558*		0.281		0.281	0.324
	(0.145)	(82.89)	(79.38)	(81.42)	(0.189)	(0.171)	(0.21)	(0.233)	(0.334)		(0.19)		(0.197)	(0.225)
Business TA (total days)		7.296*				0.0228**								
		(4.426)				(0.0114)								
Number of business trainings			-127.5**		0.410									
			(64.19)		(0.265)									
Number of all trainings to date				-61.15**										
				(26.56)										
Lagged cumulative training to date										0.056		0.0288		
										(0.10)		(0.09)		
Lagged total institutional training											0.068		0.0681	0.0435
											(0.16)		(0.162)	(0.160)
Lagged CDSS governance (2011)													-8.9e-4	
													(0.210)	
Lagged CDSS business (2011)														-0.0290
														(0.096)
ARD 2010 capacity and skills indicator		580.7**	636.3**	595.0*	1.967***	1.770***	-0.249							
		(294.9)	(309.6)	(317.4)	(0.416)	(0.485)	(0.44)							
ARD tourism management[(a)]								-0.466		0.258				
								(0.598)		(0.45)				
ARD financial & institutional[(b)]									1.516**					
									(0.718)					
Conservancy area							-0.133	-0.0897	-0.413	-0.174	-0.135	-0.129	-0.135	-0.144
							(0.15)	(0.147)	(0.257)	(0.14)	(0.14)	(0.13)	(0.156)	(0.15)
Conservancy population							0.206	0.263	-0.0351	0.112	0.186	0.0947	0.186	0.168
							(0.17)	(0.199)	(0.241)	(0.17)	(0.17)	(0.15)	(0.171)	(0.168)

Years: 2010-2013	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Dependent Variable:	No. SMEs	Conservancy income			CDSS Business Perf.		Likelihood of a JV investment in 2013							
Year	-0.158	-42.89	410.2***	504.8***	-0.243	-0.492								
	(0.403)	(184.0)	(101.7)	(123.1)	(0.462)	(0.671)								
Region 5 dummy		-646.7**	-386.7	-644.3**	-1.630**	-1.409**								
		(321.8)	(307.8)	(316.1)	(0.699)	(0.668)								
Constant	(0.682)	438.4	-394.4	-312.1	2.417*	2.776	-0.853	-0.889	-2.329**	-0.97	-1.120	-0.459	-1.116	-0.837
	1.012	(469)	(277)	(264)	(1.28)	(1.71)	(0.72)	(0.680)	(1.067)	(1.10)	(0.80)	(0.93)	(1.40)	(0.90)
Observations	65	79	79	79	53	53	26	26	25	26	28	28	28	27
Prob > χ^2	0.0000	0.000	0.000	0.000	0.000	0.000								
Pseudo R-squared							0.216	0.170	0.245	0.157	0.238	0.095	0.380	0.244

Notes: Regressions (1) to (6) are random-effects GLS regression with residuals clustered at the conservancy level. Regressions (7) to (15) are probit regressions with robust error correction. p-values are in parentheses. * p<0.10, ** p<0.05, *** p<0.01. (a) ARD average indicator 7: Identification, management of tourism enterprises and systems (average). (b) ARD: 2. Governance of Resources – Financial & Institutional (average index).
Source: ARD (2010) and CDSS database, 2010-2013.

Discussion of Key Findings

The number of JVs in a conservancy, along with the overall level of business activity in the conservancy, has a positive effect on full-time employment.

Full time employment, as well as the number of operational JVs, have increased over the course of the intervention period. Quantitative analyses demonstrate that the increased presence of JVs is linked with full-time employment in the conservancy. Additionally, an increase in conservancy revenues also increases full-time employment.

The number of SMEs in a conservancy seems to have little effect on full-time or part-time employment—but this may be due to low data quality.

Qualitative interviews suggest that the sale of crafts, typically associated with part-time employment, has contributed to increases in household incomes. We were interested in understanding the relationship between SMEs and part-time employment. When we ran our analysis on 2010-2013 data, we do not find a relationship between SMEs and part-time employment. However, it should be noted that 2013 data on SMEs is incomplete, with close to half of conservancies missing data. When we analyze just 2010-2012 data, we do find a relationship between part-time employment and SMEs. Securing better SME data for 2013, or tracking this data in 2014, may contribute to a better understanding of the role of SMEs in employment.

JVs are set up in conservancies where part-time employment is low.

The quantitative analyses revealed that JVs tended to become operational in areas where part-time employment, but not necessarily full-time employment, is lower.

There is no detectable relationship between trainings/technical assistance and conservancy business. JV grants have been noted as a key strength of the CS program– but at this time, there is not enough data available to validate these findings.

Understanding and measuring the true impacts of training on JV and SME development may require a longer period than 2010-2013. However, interviews with conservation leaders, lodge owners, and conservancy management indicated that they felt JV grants have been important in addressing key constraints to private investments. Unfortunately, there is not enough data to run analyses on the relationship between grants and JVs—as more data is collected on JV and SME presence and employment, further analyses should be conducted to corroborate the qualitative findings.

4.3 Research Question: What impact does MCA-N support have on conservancy members in terms of the distribution of benefits by gender? (RQ7)

- Benefits going to female-headed households increased over time
- Higher conservancy governance scores are associated with smaller shares of benefits distributed to female-headed households
- There is a mixed effect of training and technical assistance and share of benefits to female-headed households

A core focus of MCA-N interventions is targeted technical assistance and training around gender equality. Improvements in governance may include greater female participation in AGMs and a greater representation of females in management committees. Wider distributions of benefits across different demographics could lead to more equitable distribution of benefits by gender.

In 2013 and 2014, FGDs revealed little evidence on non-equitable distribution of benefits to women. We use benefits data from the CS household surveys to measure the distribution of cash and in-kind benefits across male and female headed households. The relationships between governance, conservancy characteristics, household characteristics, and MCA-N interventions are similar to those that we explore in Research Question 2—mainly, the link between governance level and the share of benefits to female versus male-headed households. First, we provide some background information on how the distribution of benefits has changed between baseline and endline. We then discuss the analytic approach and results.

Qualitative Results

Most conservancies reported that men and women were treated equitably for benefit distribution, but there are some exceptions. Relevant statements in the FGD are summarized here.

Muduva Nyangana Nyangana member: *"Yes, men and women all get the same benefits and all along they have been receiving the same benefits."* Uulwaluudhi member: *"If there is some benefit that comes, it is distributed to both woman and men equally."* Salambala member: *"All members say there has been no change in benefits. One respondent said all benefits are shared equally."*

Omantandeka members (non-management) say they cannot say if benefits are distributed equitably because they get no information and they are not involved in decision making about benefits. When asked if men and women receive equal distribution of benefits, they gave these responses:

R1: "The meat is given to the men for the household."
R2: "Most of the employed are men."

Quantitative Results

Background

This analysis primarily employs the share of benefits distributed to households in a conservancy by gender as a measure of equitable distribution. Table 27 displays the percentage of female-headed and male-headed households that received any kind of benefits while Table 28 breaks this down to each type of benefit. In general, a larger proportion of male-headed households receive cash benefits, non-cash benefits ($p<0.1$) and both cash and in-kind ($p<0.1$) benefits than female-headed households. The difference in terms of benefits received between baseline and endline samples is not statistically significant.

Table 27: Whether household received conservancy benefits, by head of household's gender

Type of benefits	Baseline			Endline		
	Female	***Male***	***All***	***Female***	***Male***	***All***
Did not receive benefits	64% (265)	50% (293)	56% (558)	65% (233)	48% (252)	56% (485)
Received benefits	36% (188)	50% (284)	44% (472)	35% (214)	52% (326)	45% (540)
Total	100% (453)	100% (577)	100% (1,030)	100% (447)	100% (578)	100% (1,025)

Notes: All figures are reported in 2009 NAD. While the percentages are estimated using population weights, the corresponding numbers of households are taken directly from the sample. 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. Benefits are *not* mutually exclusive in this table since households could receive more than one type of in-kind conservancy benefit.

Source: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014).

Table 28: Composition of benefits amongst households that received benefits, by head of household's gender

Type of benefits	Baseline			Endline		
	Female	***Male***	***All***	***Female***	***Male***	***All***
Cash benefits	31% (40)	36% (100)	34% (140)	43% (64)	45% (104)	45% (168)
In-kind benefits	92% (175)	90% (257)	91% (432)	86% (196)	93% (304)	90% (500)
Cash and in-kind benefits**	23% (27)	25% (73)	25% (100)	29% (46)	38% (82)	35% (128)

Notes: All figures are reported in 2009 NAD. While the percentages are estimated using population weights, the corresponding numbers of households are taken directly from the sample. 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. Benefits are *not* mutually exclusive in this table since households could receive more than one type of in-kind conservancy benefit.

Source: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014).

Analytical Approach

We hypothesized that increased levels of governance through technical assistance and trainings would improve the gender distribution of benefits. An increase in the total amount of benefits available for distribution is linked to conservancy income (and sources of conservancy income). However, an increase in the equitable distribution of benefits is linked to increased governance—in particular, greater transparency in management committee decisions, greater democratic representation, and better financial management capabilities. The focus of the analysis is on improved governance across these three categories. To examine the impact of MCA-N support to conservancies on the gender distribution of benefits, we ran the following regression:

$$B_{c,t}^{\text{fh}}/B_{c,t} = \beta_o + \beta_1 M_c + \beta_2 T_{c,t} + \beta_3 I_{c,t-1}^{\text{Gov}} + \beta_5 H_{c,t} + \beta_6 N_{c,t}^{\text{fh}}/M_c + \varepsilon_{c,t} \quad (5)$$

where $B_{c,t}^{\text{fh}}/B_{c,t}$ represents the share of benefits distributed to female-headed households out of the total amount of benefits distributed to all households in conservancy *c* in time *t*, M_c represents the number of registered members in conservancy *c*, $T_{c,t}$ represents the cumulative number of different types of trainings or days of technical assistance, including cumulative number of institutional/governance trainings, days of institutional/governance technical assistance, number of days of technical assistance on institutional and governance topics and cumulative number of benefits distribution plan trainings for conservancy *c* received in time *t*, $I_{c,t-1}^{\text{Gov}}$ represents conservancy *c*'s governance score in the period *t -1*, $H_{c,t}$ is an indicator variable for the endline survey wave, and $N_{c,t}^{\text{fh}}/M_c$ is the share of female-headed households out of all registered members in conservancy *c* in time *t*. In this regression, they key variables of interest are those that represent the different types of training and governance scores. In particular, an indicator variable for the endline survey round controls for changes in the gender distribution of benefits between surveys that is not attributable to MCA-N support. We estimated Equation 4 first using the amount of in-kind benefits received by households, and second using the total amount of combined cash and in-kind benefits received by households.

Findings

The results for Equation 4 with both measures of benefits are very similar and, for brevity, only the results with total benefits are reported here, in Table 28. The regression results show mixed evidence for the effect of technical assistance and trainings on the share of benefits going to female-headed households – an increase in total institutional/governance trainings and cumulative number of days of TA on institutional and governance topics is associated with an increase in the share of benefits distributed to female-headed households, while an increase in the number of days of institutional/governance technical assistance and total trainings on benefits distribution plan is associated with a decrease in the share of benefits distributed to female-headed households. Larger values of the conservancy governance score[35] are associated with smaller shares of benefits distributed to female-headed households—a counterintuitive finding that we also saw in Research Question 2. However, there does seem to be an improvement over time in the overall share of benefits going to female-headed households, as the coefficient on the indicator for the endline survey wave is significant and positive. Additionally, conservancies that report having more members are associated with distributing larger shares of benefits to female-headed households[36]. These regressions were re-run with the new governance data received, which did not change the results in any significant way – all of the main effects were the same in terms of significance, and only the size of the effects was changed.

[35] The governance indicator is a straight average of ratings of AGM compliance, benefits distribution, constitution, breakdown of gender in the management committee, and financial performance.

[36] Note that the proportion of female headed households and conservancy population, or number of registered members, is not strongly correlated.

Table 29: Relationship between MCA-N support and share of total benefits going to female-headed households

Dependent Variable: Female-headed household share of benefits, Baseline (2010-11) and Endline (2013-14)					
Model	(1)	(2)	(3)	(4)	(5)
No. of registered members	.000029***	.000031***	.000028***	.000031***	.000027***
	(2.10e-06)	(2.20e-06)	(2.10e-06)	(2.10e-06)	(2.00e-06)
Governance score in previous year	-0.012***	-0.012***	-0.012***	-0.014***	-0.011***
	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Indicator for endline	0.053**	0.018	0.074***	0.031**	0.076***
	(0.025)	(0.021)	(0.016)	(0.015)	(0.012)
Average no. of female household head out of all members	0.49***	0.53***	0.47***	0.57***	0.40***
	(0.07)	(0.071)	(0.073)	(0.071)	(0.069)
Cumulative no. of trainings	0.0017				
	(0.0023)				
Cumulative no. of institutional/gov. trainings		0.012***			
		(0.0038)			
Cumulative no. of institutional TA days (all institutional topics)			-0.00011		
			(0.00023)		
Cumulative no. of TA days on government topics				0.0017***	
				(0.00037)	
Cumulative no. of total benefits distribution plan trainings					-0.17**
					(0.028)
Constant	0.27***	0.27***	0.28***	0.27***	0.28***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Observations	1,881	1,881	1,881	1,881	1,881

Notes: Standard errors in parentheses. * p<0.05 ** p<0.01 *** p<0.001. "Share of all benefits going to female headed households" means the fraction of total benefits (cash and in-kind that are distributed to female headed households at the conservancy level. "Share of in-kind going to female headed households" means the fraction of total in-kind (excluding cash) benefits that are distributed to female headed households at the conservancy level.

4.4 Research Question: What is the perceived impact on recipient-household gender relationships from the intervention? (RQ8)

- Significant progress has been made, but many problems of gender inequity persist
- Improved gender relationships often result from improved economic situation of women and their ability to contribute revenue and food to the household
- Women and men report that the trainings and other assistance from their IP have helped them gain respect in their households

Qualitative Findings:

Recipient-household gender relationships

Most of the relatively sparse information collected on recipient-household gender relationships comes from the FGD with conservancy members. Participants who reported that there have been changes to gender relationships reported positive changes. These positive changes are explained as the result of women's improved economic contributions to the household or as the result of trainings received (by both men and women).

For example, in the women's only follow-on to the Muduva Nyangana Conservancy non-management FGD, one woman said, *"Since receiving assistance from NNF, I can say that we at least better in the households and we are able to do whatever we want and also people can listen to us."* The moderator said, "Are you saying that you are somehow respected now in the household because you are also bringing in economic benefits?" All respondents said "yes". One said, *"Yes, it is true that we are now free in our household."* Another said, *"Yes, because according to the human rights each person has the right to make decisions.*" The moderators said, "Are the training and all other assistance you receives from NNF has made you to be respected in your households?" All respondents said "yes". A male member of Nyae Nyae Conservancy stated, "*Before it was very difficult for men and women. …now that the NNDFN has come, I think it is better. Now I can participate, and my wife can participate. My wife does not stay behind."*

Two Salambala women members also noted a great improvement in household relationships because they are contributing financially to the household. The first said, *"My husband is happy since from the beginning I wasn't working; now I bring something home. There is happiness."* The second continued, *"The smile from my family is great these days because of the income I am bringing also."*

By contrast, a Marienfluss member said that nothing had changed. *"We are as we have always been. We just gather our products and move on. It is not impacted by the conservancy. We have just been like that."* An Uukwaluudhi member said something very similar, *"No I don't think it has changed."*

The KII similarly found the conservancy program had very positive impacts on gender equity which were reinforced with the MCA-N CS program. However, the situation is similar to that of governance– significant progress has been made, but many problems persist. It is important to understand that the MCA-N CS program was not designed to specifically address gender imbalances. An MCA-N manager stated that gender only became important about two and a half years into the program after MCC found that gender was not adequately addressed, but also mentioned that conservancies have definitely offered women many opportunities from the beginning.

A conservation leader also agrees that conservancies have always offered women many advantages. A lot of the people working on conservancy support from the beginning were women, and thus were very conscious of women's roles and constraints, and intentionally worked to maximize women's roles. The leader noted the program was an evolution ,rather than a revolution; and expressed a word of caution on western perceptions on gender.:in the traditional culture he/she grew up in,women did not speak in public, even though they played very powerful roles in their traditional culture.

Another conservation leader felt that the nature of the conservancy program allowed and provided support for women to grow from the beginning, and that MCA-N has made support for gender equity become even more effective, better integrating women into the program and designing specific initiatives such as training for women in public speaking. He/she said that support for gender equity was intensified under the MCA-N program, but that such support had always been part of the conservancy program from the beginning. He/she had statistics readily available, saying that the 2012 State of Conservancy Report that found that 48% of treasurers are women and 12 of the chairs are women. Many of the hired managers -- 7 or 8 – are women. He/she said, *"These are positions that were earned."*

Remarkable change in women's empowerment.

One conservation leader who has supported the conservancy movement since its earliest days told a telling story. He and a colleague attended a meeting in a pre-conservancy Herero community. As people were gathering, it became apparent that no women were going to participate. The two consulted, and then suggested that women be invited to attend the meeting. The translator rather disparagingly informed them that that was not how things were done, and ignored the request.

Recently this same person was at another meeting in a Herero conservancy where all the key posts were held by women. Women came to meeting without being invited and you did not need to ask them to speak up. During the meeting, one of the Herero men said that one of the benefits of the conservancy was that their women are now empowered and that this is an important contribution!

An implementer who has worked with conservancies since the beginning agrees that conservancies have always provided opportunities and have *"given space"* to rural women. He/she noted that all the MCA-N support for craft work goes into female led households.

Despite the participants (FGD and KII) who noted positive changes, FGDs indicate that problems of gender balance still remain quite pervasive across different conservancies, but nearly all of them also show a high level of awareness of the inequities that exist and a desire for change.

Muduva Nyangana members say that there has been no improvement in serious gender inequities in their conservancy, *"The way I see it, women don't participate in conservancy decisions. Men are the ones that are always making decisions."* Another states, *"There is no change, women don't take part in conservancy decisions, they are very behind and they have excluded themselves from that."* A third gives this perspective. *"Nowadays, people are talking about gender equality, if you see in our conservancy, all the resource monitors are men and there are no women there. Women are also supposed to be there, so that all of us can work together and take our conservancy ahead."*

> *We want change, we want equality, that is just what we want* – **Female Omantendeka Conservancy Member**

Four conservancies specifically identified the importance of the training that the women had received. A Nyae Nyae manager said, *"It is very important to attend these trainings. Generally our San women are very shy to talk in front of many people. These trainings have enabled us women to stand in front of a lot of men and present something."* A King Nehale member said, *"We females are not really free but the males are free. But the ones that have gotten training are free. That is why a person has to appreciate the training because if you go through training you won't be the same as the one who didn't. But there is some people, even if she gets trained she will not get free. It is a women's thing. The males are free."* A King Nehale member stated that, *"…because we have gotten training about gender, we have seen that all the people are just equal. Even when you go home you can say that 'even a disabled person you see there with no legs is just a person like you.' Yes, we had gotten training like that. We make them understand very well."* An Omantendeka manager agreed with the need for training in public speaking for women, saying "*A woman will not stand up and talk so they ought to be properly trained so they may also have a say as these benefits are for all members."* Apparently the training was effective, because another manager stated, *"Women are also given the platform to raise their views, even to say we have eaten (stolen) the money."*

Omantendeka members report no progress on women's position in the conservancy. The first respondent stated that their constitution says that there should be equality in decision making, but that this is not the case. The second made this statement, *"Even our being here (at the FGD), it is because you wanted women, had it not been for your interest we would not have come.*" The third stated, *"We are left behind. We were even surprised to hear that we are needed to this meeting, we were asking to say who said we should be part of the meeting until we were told that the person who came wants women to be part of the meeting. Had it been them we were not going to be called."* Two other comments made were, *"We want change, we want equality, that is just what we want" and, "The committee should change."*

A Marienfluss Conservancy member said that, *"Women were able to speak their mind when AGM were still held."* Another member indicated that their conservancy had been at *"the forefront"* of improving

women's role in decision making but this had been forgotten, at least for the time being, because of the severe drought. She said, *"…now it seems like we are lost each in our own world."*

A Muduva Nyangana Conservancy member said, *"…we often hear about gender equality and we don't see it being practiced here."* In a follow on session for women only, the moderator asked what they thought are the reasons that women don't do like men do? These are the responses:

R3: "I don't know maybe we are shy! Or maybe because we don't have that courage of standing in front of others and say something."
R4: "The same as my colleague have said, we have the fear of standing in front of others and express your opinion."

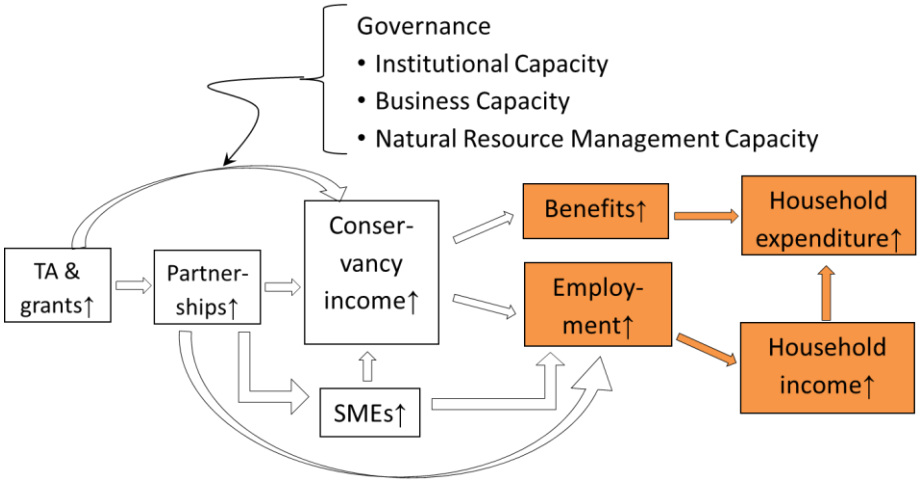
A Muduva Nyangana manager contrasts what women have the right to do with women's reality, *"…everyone who is a member of the conservancy, is free to voice their opinions. Females do what men do, and females can be leaders too but in our conservancy they don't look at women."* A Salambala manager described a similar situation, *"We still have a challenge with women, though they are given equal opportunity to apply for positions within the conservancy but few will come and do what we do. I do not know the reason behind this, maybe it is their culture to shy away, but we are encouraging them. All these things are distributed fairly to all members and equitably."*

4.5 Research Question: Do the CS activities (including grants) lead to an increase in household wellbeing over the life of its programme? (RQ4)

- Conservation leaders tend to emphasize non-monetary aspects of well-being, including a greater sense of empowerment, increased control of land and resources, increased respect, and cultural values of wildlife
- Employment in the tourism-sector highly valued; other monetary benefits reaching the household-level are not as significant
- Conservancy members emphasize monetary aspects of well-being, including income, employment (including the sale of crafts), and food
- Benefits are associated with a larger increase in income for female-headed households than male-headed households; however, females still have a lower average income, all else equal
- Tourism employment does not impact the average household—but leads to a relatively higher increase in incomes and expenditures for females than males

Ultimately, households experience both tangible and intangible impacts to their wellbeing as a result of MCA-N interventions. In previous research questions, we have established the link between MCA-N interventions and employment, as well as MCA-N interventions and benefits distribution. In monetary terms, quantitative analysis can explore the link between increased benefits, increased employment, and changes in household income and expenditure. Qualitatively, in addition to exploring these links, we can better understand the intangible and non-monetary benefits that households experienced during the evaluation period.

Figure 9: CS Program Logic: Do CS activities (including grants) lead to an increase in household wellbeing over the life of its programme?



Qualitative Findings

Impacts on Household wellbeing

Note: no definition of "well-being" was given by the FGD moderators or the KII interviewer. Participants were left to interpret the meaning of well-being on their own.

Those interviewed were asked what they considered to be the relative importance of monetary versus non-monetary impacts of the conservancy program. One conservation leader thinks that both monetary and non-monetary impacts of the conservancy program are both equally important. He/she doesn't think the program would work without both of them. Another conservation leader said that the situation varies from site to site, but feels that the non-monetary impacts of the conservancies generally outweigh the monetary benefits. One conservation leader stated, *"There has not been as much improvement in the percentage of revenues that get down to the household. As revenues increase, operating costs increase."*

Interviewees were asked what they consider the most important non-monetary impacts on well-being to be. Two conservation leaders stressed the cultural values around wildlife. People are very happy to see wildlife species reintroduced, although they don't want elephants or lions.

There was a fairly general consensus that one of the greatest non-monetary impacts of the conservancy program directly affecting well-being is the empowerment of rural people – the increased control over wildlife, lands and resources, and the pride people feel in having this power. With the development of conservancies, people said they are now organized and they have a voice. They are recognized as legal entities with the right to say what they want. Conservancies are sometimes able to influence decision making by government – a huge benefit. Conservancy members are proud of their achievements and what they have done. One conservancy leader said that, in the early days of the conservancy program, people in Kunene became committed to conserving wildlife even before it started to generate income. He/she feels that it was the sense of control and empowerment that was the key factor leading to this commitment. The meat from the wildlife is highly valued by conservancy members; the idea that they are eating meat legally from their own wildlife is very important – that it is not the government's wildlife anymore.

Not everyone feels empowered….

One of the people interviewed noted the importance of improving control over resources, citing a recent incident at Nyae Nyae Conservancy. He/she said the MET recently went to Nyae Nyae to translocate 200 of the conservancy's elephants – without consulting the conservancy. This would have directly impacted the conservancies hunting quota and revenues. Those supporting Nyae Nyae were able to get this stopped. The same interviewee said, *"We have people illegally hunting and grazing and cutting down trees in Nyae Nyae and no one is doing anything."*

An MCA-N manager argues that there is another important type of empowerment that comes from the capacity development from all of the training programs and others have echoed this theme. People in the conservancies have new knowledge, skills and resources. Residents value the trainings that

conservancies can provide. Governance training modules are being extrapolated to funerals, weddings and similar events. Members who have been trained are being elected into farmers unions, or as senior headmen or councilors; some participate on joint venture boards in Windhoek. Those trained use and pass on their knowledge, and people go to them for advice.

Other non-monetary benefits mentioned include the enhanced security of having more diversified sources of incomes. Because of conservancy support for school fees and university students, a growing number of young people from conservancies are entering into tertiary level education.

The monetary contributions from conservancies to the average household does not seem to have been large, especially for conservancies with relatively high human population densities in relation to the resource base (i.e., wildlife populations, diversity of species, quality of habitats). One exception to low monetary impacts on households are among households who have had the good fortune to have a member who has found conservancy-based employment, especially in joint-venture tourism lodges or as conservancy employees. Note that employment of conservancy members was a requirement of receiving joint venture grants.

Employment is very highly valued. One conservation leader said, *"Every single attitude survey shows that one of the key benefits is jobs."* Development of skills and mobility is highly valued. An MCA-N manager says that the joint venture grants for tourism lodges have created about 150 jobs and all this money goes directly to households. Over 80 % of JV staff come from the conservancies.

One conservation leader compared the financial returns from conservancies to that of freehold farms. He claims the returns from freehold farms are greater than those from conservancies, and that management in conservancies is a long way behind, and that there is a huge potential for improving the management and the returns from conservancies.

There seems to be a clear tendency for operation costs to increase as revenues increase. Operational costs are generally viewed negatively, but operating costs that go for salaries of conservancy employees are also one of the most highly valued benefits of those household that benefit from such employment.

Other monetary benefits at the household level have come from the sale of crafts to tourists and from the collection and sale of indigenous natural products (INP). These two sources of income provide two of the relatively rare opportunities for conservancy members to improve their household well-being as a direct function of their own efforts. Most of the revenues generated by conservancies come from joint ventures with lodge operators and safari hunting companies and these revenues are not a function of the experience, skills or efforts of the individual members or households.

The FGD responses to questions on how their household well-being has changed over the last three years were all in practical terms: about food, income and making a living. None of them spoke of non-monetary benefits such as empowerment or the reintroduction of wildlife. The most commonly cited reason for improved well-being was income from INP. One members of Muduva Nyangana said: *"My*

family is better off in the sense that we are able to make a living from harvesting Devil's' Claw and it is not necessarily that we are better off because we are in the conservancy."

Other conservancy-based reasons cited were employment, meat, cash and sale of crafts. A Salambala member said *"My household has improved in the last few years to be in a better position."* due to the *".. introduction of the conservancy, tourism and jobs that we benefit from indirectly. My household is better off because I had employment from the conservancy, though I am not now. I got portions of meat to feed my family and cash."*

The drought was mentioned as a limiting factor: A Marienfluss member said, "*Well-being has decreased because of the drought. Everyone lives in their own world. There are less tourist and less revenues from joint ventures. Everything is impacted by the drought."*

Quantitative Findings

Qualitative findings suggest that while conservancy leaders and implementers underscore the non-monetary benefits associated with MCA-N interventions, households in particular articulate tangible benefits in the form of increased employment and food. In order to better quantify the relationship between CS activities and household well-being, we examine whether increases in benefits and employment are linked with higher household incomes and expenditures. As illustrated in Section 4.2, the monetary impact of all technical assistance is through employment and benefits. The assistance to employment and assistance to benefits links are analyzed above so here we only need to look at the next link, namely, benefits to income. The following analyses will focus primarily on the immediate link between conservancy income, tourism-related employment, and measures of household well-being.

Background[37]

In order to understand the relationship between CS activities and household well-being, we examine whether increases in benefits and employment (as a result of increased conservancy income and partnerships), in turn raise household income and household expenditures. Table 29 includes the mean income, expenditure, and assets in each conservancy. We use income and expenditure measures in order to triangulate estimates of household living standards—that is, we draw conclusions only when there is consistency among multiple measures, rather than placing the entire burden of proof on any one measure alone.

[37] 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.

On average, we see that household income has increased between baseline and endline. There is variation amongst conservancies in average income and expenditure.

Table 30: Household income, expenditure, and assets, by conservancy (2012 NAD)

Conservancy	n	Baseline means			Endline means		
		Income	Expendi-ture	Assets	Income	Expendi-ture	Assets
Anabeb	81	6,016	6,135	114	9,000	7,856	265
Balyerwa	50	6,939	4,663	1,226	9,830	9,006	324
Doro !Nawas	70	7,098	12,250	4,254	8,921	13,461	2,537
Ehirovipuka	48	7,676	13,766	1,979	8,272	11,750	3,580
George Mukoya	84	7,515	8,500	2,030	11,715	11,436	2,444
Khoadi Hoas	92	12,927	12,644	4,530	15,354	11,399	4,012
King Nehale	32	4,114	8,965	278	8,554	6,737	1,785
Kwando	92	5,635	8,400	1,260	11,896	12,522	2,700
Marienfluss	44	4,753	6,839	78	9,283	6,967	380
Mashi	239	8,972	8,741	4,236	10,461	10,721	4,319
Mayuni	93	8,732	8,705	4,806	11,289	8,116	5,067
Muduva Nyangana	48	22,527	14,982	6,964	13,670	13,301	5,724
N#a-Jaqna	216	9,120	8,688	3,579	7,539	8,331	4,283
Nyae Nyae	24	11,731	11,355	2,800	9,990	11,981	5,594
Omatendeka	48	13,610	10,647	5,255	7,305	7,397	5,197
Orupembe	24	10,248	4,917	2,330	7,747	8,005	2,906
Puros	120	2,129	13,951	5,055	10,995	13,189	3,710
Salambala	96	8,959	8,774	2,602	5,378	7,927	1,854
Sanitatas	24	8,721	13,929	3,427	8,010	13,495	3,170
Sesfontein	97	5,959	5,107	711	7,830	3,920	610
Sheya Shuushona	48	2,217	4,112	431	8,796	3,735	771
Sikunga	48	5,687	9,368	1,597	13,081	8,886	2,674
Sorris Sorris	72	3,110	10,809	2,216	5,855	8,379	2,222
Torra	23	2,024	9,211	2,401	8,064	9,479	5,340
Uibasen/Twyfelfontein-Uibasen	48	5,009	8,518	1,985	2,649	6,979	2,456
Uukolonkadi-Ruacana	24	6,554	9,204	2,419	7,522	8,393	2,021
Uukwaluudhi	24	8,706	14,533	2,181	6,137	8,919	2,679
Wuparo	147	1,444	10,121	1,706	6,760	9,969	3,420
Overall (average across all conservancies)	2057	6,766	9,155	2,889	8,445	9,282	3,163

Source: NORC CS Household Survey Baseline (2010-2011) and Endline (2013-2014).

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.

The average income for male-headed households is higher than the average income for female-headed households at both baseline and endline. The difference is statistically significant at the 1% level at both endline and baseline.

Table 31: Household income, expenditure, and assets by head of household's gender (mean NAD)

Gender of head		Baseline					Endline			
	Number of households	**Mean income**	**Median income**	**Mean expenditure**	**Mean assets**	**Number of households**	**Mean income**	**Median income**	**Mean expenditure**	**Mean assets**
Female	387	5,709	3,532	8,782	2,641	380	6,706	4,579	8,641	3,027
Male	472	7,644	3,723	9,939	3,296	412	9,623	6,382	9,864	3,228

Source: CS Household Survey, 2011 and 2014.
Note: Outlier observations outside of two standard deviations from the (full) sample mean have been removed.

Finally, below is a table of sociodemographic descriptive statistics of panel households at baseline and endline, giving an indication of the average demographics of the households included in the analysis. There is a slight increase in the number of households with heads who have a secondary or higher education, while there is a slight decline in the percent of household heads that are female.

Table 32: Sociodemographic descriptive statistics

	All households		**Panel households**	
	Baseline	**Endline**	**Baseline**	**Endline**
% of heads w/ secondary or higher education	29.2	32.3	28.1	30.4
% of households heads that are female	44.0	43.6	46.1	43.9
Mean age of household head	48.3	50.0	48.9	50.8
Size of household	5.1	5.4	5.5	5.5

Source: CS Household Survey, 2011 and 2014.

Impact of conservancy benefits on household expenditure

Analytic approach

First, we examine the relationship between household benefits $B_{h,t}$ and household expenditures $X_{h,t}$. As discussed earlier, there are two categories of benefits a household *h* can receive at time (round) *t*:

cash ($B^{\$}_{h,t}$) and in-kind ($B^{\mathrm{IK}}_{h,t}$).[38] Economic theory suggests that a household consumes out of income, though it need not have the same "marginal propensity to consume" (MPC) from different income sources.[39] Hence, we would expect an increase in *cash* benefits to increase consumption (i.e., household expenditure). Also in theory, we would expect some substitution (reduction) of expenditures from an in-kind benefit. For example, one might buy less meat if meat is given to you from the conservancy. On the other hand, such an in-kind benefit would also increase the household's effective income, from which additional consumption could be forthcoming. The net result of these two effects from an increase in in-kind benefits on consumption is, therefore, unclear. Finally, some specifications include the total or per-member level of benefits distributed by the conservancy in the previous year.

A second though related issue is how households with *negative* income behave. Do they follow the same propensities as do those with positive incomes? Again, turning to economic theory we find two influences. First, ironically, it is wealthier households that have the largest negative incomes. For example, at baseline, the average value of assets for households with negative income was NAD 16,877 versus NAD 4,491 for those with positive income; the corresponding figures at endline were NAD 343,879 versus NAD 11,647. We would expect such negative-income households to have a much larger MPC than those with positive income.

A third possible effect in principle comes from the gender of the head of household. The MPC could depend on gender. Women tend to be more frugal than men. We would also expect that the autonomous component of spending – what one would spend if income were zero – might be different for female heads of household.[40]

To estimate these three effects we add a number of explanatory variables to control for other *observable* sources of influence. These include conservancy characteristics (e.g., age, location, membership size), household characteristics (e.g., gender and age of the head of household, size of the household), and the round (baseline or endline). These two groups of controls are denoted $\boldsymbol{C}'_{\boldsymbol{c,t}}$ and $\boldsymbol{H}'_{\boldsymbol{h,t}}$ in the model, below.[41] We also endeavor to control for *unobservable* household idiosyncrasies (e.g., special skills) influences by using a fixed-effects model specification for the econometric estimation.

Yet another potentially salient set of influences on household expenditure could be the institutional quality of the conservancy. Hence, we examine how the above-specified model changes with the

[38] One complication is that, below, monitoring data from CDSS includes public infrastructure benefits while the NORC household survey does not.

[39] The marginal propensity to consume measures the percent of an additional NAD of income that spent.

[40] The MPC and the autonomous component of expenditure correspond to the slope and intercept of the consumption function.

[41] The bold font implies a vector of variables and the apostrophe implies the transpose of the vector.

addition of one or more of the following, denoted by $\boldsymbol{Z'_{c,t}}$ in the model, below: the CDSS overall governance rating, the CDSS financial performance indicator, the CDSS AGM general compliance indicator, and the percent of households in a conservancy that reported attending an AGM.[42]

Combining all these effects provides the following main equation to estimate:

$$X_{h,t} = \beta_o + \beta_1 Y_{h,t} + \beta_2 B^{\$}_{h,t} + \beta_3 B^{\mathrm{IK}}_{h,t} + \beta_4 G_h + \beta_4 D^{\mathrm{Y}}_{h,t} + \delta_D D^{\mathrm{Y}}_{h,t} Y_{h,t} + \delta_G G_h Y_{h,t} + \delta_{\$} G_h B^{\$}_{h,t} + \delta_{\mathrm{IK}} G_h B^{\mathrm{IK}}_{h,t} + \beta_5 B_{c,t-1} + \boldsymbol{Z'_{c,t}\beta_1} + \boldsymbol{H'_t\theta_H} + \boldsymbol{C'_c\theta_C} + u_h + \varepsilon_{h,t} \quad (1)$$

In this equation we are particularly interested in the sign and statistical significance of the interaction terms, namely, the δ. For example, $\delta_{\$}$ indicates whether female heads of household are treated differently than male-headed households with regard to cash benefits received from the conservancy.

It is important to note that only conservancy-level benefits data are reported to/by CDSS. These are annual and cover the period 2010-2013 and are available disaggregated into public and private in-kind ($B^{\mathrm{IK}}_{c,t}$) and cash components ($B^{\$}_{c,t}$). While this is helpful, they do not indicate how much each household actually received and, therefore, equity issues cannot be examined from them. Thus, we supplement CDSS benefits data by using the household survey data. (The survey data also permitted the generation of population-weights to create a parallel set of both the conservancy-level estimates of the two benefits components as well as the percent of households that participated in an AGM).

Findings

Results of estimating the various specifications of Expression 1 (minus the governance terms) are presented in Table 33 and Table 34, below. While these tables contain many findings, let us highlight the most salient ones. When we look at Table 33 (which does not treat households with negative income differently from those with positive income), then no matter how we measure benefits and whether we include them as a total per conservancy or as a within-conservancy household average, there does not seem to be any effect on household expenditure. In Table 34, which adds additional terms to account specifically for households with negative income, we find that female heads of household increase their expenditures due to an increase in conservancy in-kind benefits relative to those of male-headed households. Moreover, there is an especially strong effect from conservancy in-kind (but not cash) benefits on expenditure for households with negative income. Table 35 shows that including any of the

[42] Financial performance indicator is an indicator constructed by CDSS. The score consists of 11 measures of routine financial management. These include the existence and use of a policy document, monthly reconciliations, requisition procedures, filing and record keeping, banking of income, issuing of receipts, report preparation and independent review. AGM general compliance indicator is an indicator constructed by CDSS. Inputs into the score include: whether AGM was called, AGM held, whether a quorum was attained, attendance register kept, minutes taken, chairpersons report, financial report and & budget presented and approved.

four governance indicators has no effect on these findings as well as indicates that governance measures themselves do not influence household expenditure.

Table 33: Influence of conservancy benefits on household expenditure

Dependent variable: Household Expenditures (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. cash+in-kind real benefits (M)	-0.2236 (1.4102)							
Conser.-level cash+in kind real benefits (M)		0.8616 (1.1414)						
HHHgen x hh benefits (M)		-0.9334 (1.1611)						
Conserv. avg. cash+ in kind HH real benefits (S)			0.0271 (0.7260)					
Conserv.-level in-kind real benefits (S)				-0.0300 (0.0189)	-0.0306 (0.0192)	0.0070 (0.0095)		
Average in-kind real benefits (S)							5.1866 (3.3114)	5.2101 (3.3632)
HHHgender = Male	5.7e+3 (3.6e+3)	1.0e+3 (2.2e+3)	5.7e+3 (3.6e+3)	1.4e+4** (5.8e+3)	1.5e+4** (5.8e+3)	7.9e+3** (3.5e+3)	7.8e+3** (3.5e+3)	7.8e+3** (3.6e+3)
Household Size	2.5e+3*** (589.3)	1.2e+3*** (373.7)	2.5e+3*** (591.9)	984.6203 (856.3)	945.1834 (861.9)	1.9e+3*** (520.9)	2.0e+3*** (525.6)	2.0e+3*** (507.5)
Real HH income				0.2783 (0.1755)	0.2878 (0.1773)	0.3295 (0.2752)	0.3357 (0.2785)	0.3353 (0.2806)
HHHgend*HHincome				-0.1999 (0.1882)	-0.2093 (0.1900)	-0.2683 (0.2868)	-0.2742 (0.2901)	-0.2738 (0.2915)
Conserv. latitude					5.6e+3*** (1.6e+3)	6.0e+3*** (2.2e+3)	6.1e+3*** (2.2e+3)	6.1e+3*** (2.3e+3)
Ln(conservancy age)	8.4e+3 (1.6e+4)	-1.6e+4** (7.3e+3)	8.4e+3 (1.6e+4)			50.3005 (1.2e+4)	-7.9e+2 (1.2e+4)	
Round	-3.0e+3 (4.6e+3)	3.0e+3 (2.2e+3)	-3.0e+3 (4.6e+3)	-6.8e+2 (1.3e+3)	-8.9e+2 (1.3e+3)	-1.9e+3 (4.1e+3)	-1.7e+3 (4.1e+3)	-1.9e+3* (1.1e+3)
Constant	-1.7e+4 (3.8e+4)	4.4e+4*** (1.6e+4)	-1.7e+4 (3.8e+4)	6.4e+3 (6.0e+3)	-9.3e+4*** (3.0e+4)	-1.1e+5** (5.1e+4)	-1.1e+5** (5.1e+4)	-1.1e+5** (4.3e+4)
Observations	1879	975	1879	2046	2041	1922	1874	1874
R-squared	0.050	0.076	0.050	0.107	0.109	0.111	0.113	0.113

See notes at the end of the table.

Influence of conservancy benefits on household expenditure (continued)

Dependent variable: Household Expenditures (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**								
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Avg. cash+in-kind real benefits (M)								0.5942
								(1.5184)
Cons. cash+in kind real benefits (M)	-0.1226	-0.0319		-0.1448	-0.0542			
	(0.1909)	(0.1794)		(0.1797)	(0.1598)			
Cons. Cash + in kind real benefits (S)							0.0003	
							(0.0006)	
Household Size	892.4732***	885.1000***	916.1424	913.2000***	905.4621***	1.9e+3***	1.9e+3***	2.0e+3***
	(344.3496)	(335.4394)	(888.4320)	(347.5598)	(338.6860)	(520.5730)	(519.7739)	(507.9798)
Ln(conservancy age)		-1.4e+4**			-1.4e+4**	-9.1e+2	-47.0637	
		(6.8e+3)			(6.8e+3)	(1.2e+4)	(1.3e+4)	
Round	-1.6e+3	2.4e+3	940.1340	-1.6e+3	2.3e+3	-1.6e+3	-2.0e+3	-2.1e+3*
	(1.1e+3)	(2.1e+3)	(1.7e+3)	(1.1e+3)	(2.1e+3)	(4.1e+3)	(4.5e+3)	(1.1e+3)
HHHgen=Male	-58.8157	597.6120	1.5e+4***	-37.0426	618.7619	7.8e+3**	7.9e+3**	7.8e+3**
	(2.1e+3)	(2.1e+3)	(5.7e+3)	(2.1e+3)	(2.1e+3)	(3.5e+3)	(3.5e+3)	(3.6e+3)
Real HH_income	0.2227***	0.2208***	0.3027*	0.2188***	0.2173***	0.3286	0.3300	0.3360
	(0.0659)	(0.0641)	(0.1750)	(0.0659)	(0.0642)	(0.2750)	(0.2752)	(0.2827)
HHHgen*HH_inc	-0.0883	-0.1072	-0.2226	-0.0860	-0.1051	-0.2673	-0.2686	-0.2745
	(0.1102)	(0.1096)	(0.1889)	(0.1102)	(0.1096)	(0.2867)	(0.2867)	(0.2937)
Conserv. latitude			5.4e+3***	9.7e+3	9.6e+3	6.0e+3***	6.0e+3***	6.1e+3***
			(1.6e+3)	(6.2e+3)	(5.9e+3)	(2.2e+3)	(2.2e+3)	(2.3e+3)
Constant	8.6e+3***	4.0e+4***	-9.4e+4***	-1.7e+5	-1.3e+5	-1.0e+5**	-1.1e+5**	-1.1e+5**
	(2.2e+3)	(1.5e+4)	(3.0e+4)	(1.1e+5)	(1.1e+5)	(5.1e+4)	(5.2e+4)	(4.3e+4)
Observations	976	975	2041	973	972	1922	1922	1874
R-squared	0.097	0.111	0.100	0.098	0.112	0.111	0.111	0.113

See notes at the end of the table.

Influence of conservancy benefits on household expenditure (continued)

Dependent variable: Household Expenditures (in 2012 NAD) Years: Baseline (2010-2011) and Endline (2013-2014)			
	(17)	(18)	(19)
Total real benefits distributed (M)			-0.0022
			(0.0056)
Average cash+in-kind real benefits HH reported (S)	0.4565	0.4518	
	(0.7470)	(0.7632)	
Household Size	2.0e+3***	2.0e+3***	1.9e+3***
	(508.7)	(526.4)	(507.4)
Ln(conservancy age)		-9.0e+2	-2.2e+3
		(1.3e+4)	(1.1e+4)
Round	-2.2e+3*	-1.9e+3	-9.6e+2
	(1.1e+3)	(4.2e+3)	(3.6e+3)
HHHgender =Male	7.8e+3**	7.8e+3**	7.8e+3**
	(3.7e+3)	(3.6e+3)	(3.4e+3)
Real HH income	0.3368	0.3372	0.3258
	(0.2821)	(0.2800)	(0.2771)
HHHgender*HHincome	-0.2753	-0.2757	-0.2647
	(0.2930)	(0.2916)	(0.2890)
Conserv. latitude	6.1e+3***	6.1e+3***	5.9e+3**
	(2.3e+3)	(2.2e+3)	(2.3e+3)
Constant	-1.1e+5**	-1.1e+5**	-1.0e+5*
	(4.3e+4)	(5.2e+4)	(5.3e+4)
Observations	1874	1874	1922
R-squared	0.113	0.113	0.111

Notes: Dependent variable is real household expenditure from all monetary income sources. All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter.

Table 34: Influence of conservancy benefits on household expenditure (accounting for $Y_h<0$)

Dependent variable: Household Expenditures (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**		
	(1)	(2)
Neg_inc==1 (Yes)	-2.2e+03	-3948.921
	(3.9e+03)	(4.1e+03)
Cons_ben to HH, cash (S)	-1.9508	-1.6555
	(1.8416)	(1.7393)
Neg_inc* Cons_ben to HH, cash (S)	-0.0397	1.0830
	(3.2403)	(3.2045)
Cons_ben to HH, in kind(S)	1.8820	1.5722
	(1.5948)	(1.4891)
Neg_inc* Cons_ben, in kind (S)	9.2301***	8.9795***
	(2.0619)	(2.0565)
HHHgender = Male	1.4e+04**	12636.8**
	(5.9e+03)	(5.5e+03)
HHHgen*Cons_ben, cash (S)	1.7832	1.5767
	(1.8499)	(1.7469)
HHHgen*Cons_ben, in kind (S)	-6.5069***	-5.8753***
	(2.4228)	(2.2644)
Conserv. latitude	2.5e+03	3.3e+03**
	(2.2e+03)	(1.6e+03)
Age of head of HH	5.0260	-10.8804
	(118.1379)	(109.9163)
Household Size	1.4e+03	1.1e+03
	(936.0240)	(874.1891)
Round	2.9e+03	1.9e+03
	(2.1e+03)	(2.1e+03)
Real HH income		0.0922
		(0.0685)
Neg_inc*HH_income		-1.3658***
		(0.4227)
Constant	-4.2e+04	-5.5e+04*
	(4.1e+04)	(3.0e+04)
Observations	1991	1991
R-squared	0.044	0.099

Notes: Dependent variable is real household expenditure from all monetary income sources. All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter.

Table 35: Influence of conservancy benefits and governance on household total expenditure

Dependent variable: Household Expenditures (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CDSS governance indicator	315.6 (581)	473.45 (784.3)						
CDSS AGM rating			-2.0e+2 (165.8)	-42.9 (298.5)				
CDSS financial management					550.4 (445.0)	67.5 (321.2)		
AGM attendance							13.576 (47.8)	77.03 (52.35)
Conserv. latitude	6.2e+3*** (2.2e+3)	9.5e+3* (5.7e+3)	7.6e+3*** (2.2e+3)	9.5e+3 (6.1e+3)	6e+3*** (2.2e+3)	9.8e+3* (5.9e+3)	6.1e+3*** (2.2e+3)	8.2e+3 (5.4e+3)
Male HH head	7.7e+3** (3.5e+3)	856 2095.97	6.7e+3** (3.2e+3)	649.89 (2117)	7.6e+3** (3.5e+3)	748.89 (2135)	7.9e+3** (3.5e+3)	997.85 2074
HH income, real	0.3373 (0.2774)	0.21*** (0.0636)	0.4544* (0.2716)	0.21*** (0.07)	0.3352 (0.2785)	0.21*** (0.06)	0.3368 (0.2771)	0.21*** (0.061)
MaleHd*HH_inc_r	-0.2757 (0.2890)	-0.1004 (0.1116)	-0.4219 (0.2724)	-0.094 (0.11)	-0.2737 (0.2900)	-0.099 (0.11)	-0.2752 (0.288)	-0.103 (0.11)
Household Size	2.0e+3*** (527.0)	914*** (346.8)	1.4e+3*** (359.70)	899.8*** (345)	2.e+3*** (519.5)	919*** (346)	2e+3*** (523)	905*** (338.8)
Round	-2.6e+3 (4.9e+3)	1.7e+3 (2.5e+3)	2.8e+3 (3.6e+3)	2.4e+3 (2.5e+3)	-1.6e+3 (4.1e+3)	2.2e+3 (2.3e+3)	-2.2e+3 (4.3e+3)	363 (2.3e+3)
Ln(conserv. age)	-49.9 (1.3e+4)	-1.6e+4** (7.4e+3)	-1.0e+4 (1.0e+4)	-1.4e+4** (6.7e+3)	-8.3e+3 (1.0e+4)	-1.5e+4** (6.4e+3)	78.716 (1.2e+4)	-1.2e+4* (6.2e+3)
Avg. in-kind bfts cons. distr'd (S)	5.6081* (3.396)		5.62 (3.53)		4.5518 (3.28)		5.234 (3.317)	
Real conserv. ben_cashinkd (S)		0.3882 (1.11)		0.2742 (1.10)		0.2615 (1.10)		0.4365 (1.063)
(MaleHead) * Real con_ben_cashinkd		-0.4132 (1.11)		-0.33 (1.11)		-0.32 (1.11)		-0.503 (1.08)
Constant	-1.1e+5** (5.0e+4)	-1.3e+5 (1.0e+5)	-1.1e+5** (5.5e+4)	-1.3e+5 (1.1e+5)	-9.4e+4* (5.3e+4)	-1.4e+5 (1.1e+5)	-1.1e+5** (4.8e+4)	-1.2e+5 (9.8e+4)
Observations	1874	972	1800	963	1874	972	1874	972
R-squared	0.114	0.114	0.160	0.110	0.115	0.112	0.114	0.117

Notes: Dependent variable is real household expenditure from all monetary income sources. All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter.

Impact of tourism employment on household income

Analytic approach

Another direct benefit to households from conservancy activities is tourism-related employment. We explore whether the level of tourism-related employment, $L_{c,t}^{S}$ influences household income, $Y_{h,t}$. At first it would seem obvious that employment should increase household income. However, workers might drop one job to take another for non-monetary motives; likewise, having a tourism job might preclude looking for a different job. We also hypothesize that an increase in a conservancy's own revenues, R^{C} should lead to greater household income, *ceteris paribus*.

We then investigate the employment-income link in a number of ways linked to the quality of conservancy governance and to household participation in conservancy governance (AGM participation). These links include:

- Head-of-household gender effects and whether a given level of conservancy tourism employment is more likely distributed to one gender than the other;
- Quality of governance (via four different measures, above), $Q_{c,t}$;
- Extent of household participation in village-level conservancy meetings, $M_{h,t}$, both on level of household income and on the household getting more from a given number of tourism jobs;

To determine the existence of these effects we specify the following regression equation:

$$Y_{h,t} = \beta_o + \beta_1 G_{ih} + \beta_2 L_{c,t} + \beta_3 M_{c,t} + \beta_4 Q_{c,t} + \delta_1 L_{c,t} G_h + \delta_2 M_{h,t} L_{c,t} + \boldsymbol{H_t'\beta_6} + \boldsymbol{C_c'\beta_7} + u_h + \varepsilon_{h,t} \quad (2)$$

where the additional variables are defined as in Expression (1), above, and the equation is estimated using panel fixed-effects regression with robust standard errors.

Findings

Results of estimating the various specifications of Expression 2 are presented in Table 36 and Table 37. Again, this table holds many interesting findings. We only consider the most pertinent to the relationship between household income and jobs. Once household and conservancy characteristics are taken into account, we are not able to detect an impact of the total number of jobs in a conservancy and the level of a household's income. On the other hand, we do find that, for a given amount of tourism employment in a conservancy, female heads of household tend to have higher household income than male heads of household; at the same time we find that, in general, households with male heads have household incomes of between NAD 8,000 and NAD 17,000 higher than households with female heads. There is also some evidence that, for a given amount of tourism employment in a conservancy, those who attend village conservancy meetings have a higher household income.

Regarding the governance indicators and conservancy income, the results disappoint. First we do not find a detectable effect of an increase in governance on household income once accounting for the level of tourism employment in the conservancy. Stranger still, we find that total conservancy income has a

statistically significant *negative* impact on household income once accounting for the level of tourism employment (but not governance) in the conservancy.

Table 36: Influence of household employment in tourism on household income

Dependent variable: Household Income (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**			
	(1)	**(2)**	**(3)**
Conservancy employment in tourism	-68.5	-130	-110
	(78.2)	(101)	(100)
Conserv. tourism employ't x MaleHHH	-35.4	-29.1	-27.5
	(43.9)	(45.4)	(44.7)
Conservancy latitude	-8.7e+3	-9.5e+3	-9.6e+3
	(9.9e+3)	(1.0e+4)	(9.9e+3)
Male household head	1.3e+4**	1.3e+4**	1.2e+4**
	(5.3e+3)	(5.3e+3)	(5.2e+3)
Household head's age	402*	391*	386*
	(227)	(223)	(222)
Household Size	3.3e+3*	3.5e+3*	3.4e+3*
	(1.7e+3)	(1.8e+3)	(1.8e+3)
Round	1.2e+4***	1.5e+4***	1.5e+4***
	(4.7e+3)	(5.7e+3)	(5.8e+3)
Real conservancy income		-0.0236**	-0.0222**
		(0.0114)	(0.0111)
HH tourism employment income			-0.0051
			(0.0057)
Constant	1.3e+5	1.6e+5	1.6e+5
	(1.7e+5)	(1.8e+5)	(1.8e+5)
Observations	1991	1991	1991
R-squared	0.036	0.041	0.042

Notes: All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013).

Table 37: Influence of governance, tourism employment, and HH participation in governance

Dependent variable: Household Income (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
CDSS governance indicator	183.232				
	(1.1e+3)				
CDSS AGM rating		229.377			
		(233.06)			
CDSS financial management rating			-2.4898		
			(640.30)		
Average AGM attendance				45.1716	
				(103.0745)	
Avg. real total benefits distr'd to HH (M)					-0.612
					(2.312)
Male head of household	1.7e+4***	8.7e+3***	1.4e+4***	1.7e+4***	1.4e+4**
	(6.0e+3)	(3.0e+3)	(5.5e+3)	(6.0e+3)	(5.8e+3)
Cons. tourism employment (S)	-1.3e+2	-1.2e+2	-1.4e+2	-1.2e+2	-1.6e+2
	(120.419)	(119.25)	(117.45)	(121.11)	(166.29)
MaleHHhead*Cons. tourism employ't	-75.465*	-25.619	-52.187	-76.888*	-49.91
	(42.817)	(30.175)	(38.867)	(43.06)	(38.4)
Conservancy Latitude	-1.9e+4***	-1.8e+4***	-1.8e+4***	-1.9e+4***	-1.8e+4***
	(3.7e+3)	(3.8e+3)	(3.6e+3)	(3.6e+3)	(3.6e+3)
Head-of-household age	163.1850	32.5649	47.238	164.889	46.93
	(113.08)	(69.597)	(70.85)	(108.276)	(71.15)
Household Size	1.8e+3***	1.7e+3***	1.9e+3***	1.8e+3**	1.9e+3***
	(706.8)	(597.27)	(676.40)	(711.695)	(676.6)
Round	1.9e+3	1.4e+3	2.4e+3	1.8e+3	2.5e+3
	(3.8e+3)	(2.3e+3)	(3.6e+3)	(2.8e+3)	(2.0e+3)
Freq. of HH village conserv. mtg. attendance	-1.1e+3	-8.3e+2	-1.1e+3	-1.0e+3	-1.2e+3
	(1.1e+3)	(1.2e+3)	(1.1e+3)	(1.1e+3)	(1.3e+3)
Cons. mtg. attendance freq'y. x Cons. tourism employ't	14.6336	12.4004	14.694*	13.485	15.631
	(9.0222)	(9.31)	(8.820)	(9.196)	(10.32)
Constant	3.4e+5***	3.3e+5***	3.4e+5***	3.3e+5***	3.4e+5***
	(6.4e+4)	(6.6e+4)	(6.3e+4)	(6.2e+4)	(6.4e+4)
Observations	1655	1555	1628	1655	1598
R-squared	0.076	0.062	0.070	0.077	0.069

Notes: All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter.

Impact of conservancy benefits on household income

Analytic approach

It is tempting to speculate that conservancy benefits would raise household incomes. Further thought, however, casts doubt onto this supposition. First, it is not clear what theory of change would lead benefits to increase income (other than if we were to simply include benefits received from the conservancy in our income measure). Second, even if there were a correlation between household income and conservancy benefits, it is not clear which direction the causality would go. Do benefits through some channel raise incomes – say, if they were invested? Or do higher- (lower-) income households receive some special treatment when benefits are distributed?

The solution is to develop instrumental variables for the household conservancy benefits. These are then used instead in the household income regressions. The three alternative instruments derived by estimating predictions for real household conservancy benefits (cash and in kind) using three different specifications as given in Table 38. The main differences in these specifications are found in the top block of explanatory variables. The first two contain alternative measure of the average per household total benefits distribution of the conservancy, one inferred from the weighted sum of household-survey respondents within the respective conservancy and the other as reported by CDSS. The third specification includes the latter figure not deflated by the number of members in the conservancy.

Findings

We first confirm the (naïve) relationship between conservancy benefits and household income. This is shown in Table 39. In models (1) through (4), for two alternative governance indicators (CDSS AGM performance and CDSS Financial Management) and where total distribution is and is not held constant at the conservancy level, we see the amount of total benefits a household receives is strongly correlated with income (though the size of the correlation is four-times larger for female heads of household). Notice, however, we say "correlation" and not "impact". The reason why is seen in models (5) through (8), which apply three alternative instruments to control for "reverse causation" – to shut down the chance that the amount of benefits received somehow depends on income – as postulated, above.

What we find is that, regardless of the specification (i.e., which governance variable and which instrumental variable), there is still a correlation between household conservancy benefits and household income. The impact – and now we can use that term – is a bit smaller than without the instrumental correction but it is still statistically significant. Specifically, in female-headed (male-headed) households, a 1 NAD increase in conservancy benefits received tends on average to increase household income by 3 NAD (0.07 to 0.32 NAD) at a 5-percent level of statistical significance.

Table 38: Derivation of instrumental variables for total real household conservancy benefits

Dependent variable: Household Income (in 2012 NAD) **Years: Baseline (2010-2011)**			
Models:[(a)]	(1, *i*=S)	(2, *i*=M)	(3, *i*=ttl)
Av. cons. bfts distr'd (S)	0.8799*** (0.2150)		
MaleHHH x av distr'd bfts (S)	-0.4051* (0.2264)		
Av. cons. bfts distr'd (M)		1.3745*** (0.3547)	
MaleHHH x avg. distr'd bfts (M)		-1.0848** (0.4231)	
Total cons. real bfts distr'd (M)			0.0026*** (0.0009)
MaleHHH x ttl HH cons. bfts			-0.0011 (0.0009)
MaleHHH	80.4 (426)	325 (474)	16.3522 (511.28)
Household Size	89.86 (57.0)	76.06 (57.17)	89.2774 (58.02)
Age of HHH	26.9** (13.5)	25.04* (13.6)	26.29* (13.8)
Cons. latitude	1.4e+4*** (1.7e+3)	1.4e+4*** (1.7e+3)	1.4e+4*** (1.7e+3)
Round	-1.4e+2 (197.8)	-1.8e+2 (198.8)	-3.2e+2 (203.3)
Constant	-2.6e+5*** (3.1e+4)	-2.6e+5*** (3.2e+4)	-2.6e+5*** (3.2e+4)
Observations	925	925	942
R-squared	0.245	0.238	0.219

Notes: All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter. (a) The models predict the three instruments used in Table 39.

Table 39: The association between conservancy benefits and household income

Dependent variable: Household Income (in 2012 NAD) **Years: Baseline (2010-2011) and Endline (2013-2014)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Real_cons_benefits, cash & in kind	3.88***	4.1872***	4.015***	4.263***	3.3114**	3.6134**	2.9564*	2.9516*
	(1.38)	(1.4182)	(1.4511)	(1.4862)	(1.5023)	(1.5485)	(1.5628)	(1.576)
MaleHHH x cons bens, real	-3.04**	-3.6001**	-3.156**	-3.62**	-2.7160*	-3.0982*	-2.4014	-2.371
	(1.45)	(1.4858)	(1.52)	(1.555)	(1.5573)	(1.6042)	(1.5887)	(1.596)
total_distr_real			-0.0038	-0.007				
			(0.008)	(0.008)				
MaleHHH x Total cons. bfts to HHs			0.0001	-0.004				
			(0.008)	(0.008)				
CDSS AGM perf. Rating	1.1e+3***		1e+3***		1.1e+3***		1.1e+3***	1.1e+3***
	(235)		(239)		(253)		(253)	(254)
CDSS financial mgt. performance		-1.5e+2		-385		-278		
		(428)		(461)		(458)		
hhben_ttl (*i*=ttl)					1.2377	0.5125		
					(1.147)	(1.1735)		
hhben_av_distr (*i*=S)							1.4247	
							(1.1073)	
hhben_av_distr (*i*=M)								1.3548
								(1.1100)
MaleHHH x hhben_*i*					-0.2114	-0.3248	-0.2603	-0.2279
					(0.2657)	(0.2749)	(0.2745)	(0.2699)
ln(conservancy age)	-1.3e+4**	5.5e+3	-1.2e+4**	9.1e+3	-1.5e+4**	4.9e+3	-1.5e+4**	-1.5e+4**
	(5.9e+3)	(5.9e+3)	(6.1e+3)	(6.5e+3)	(6.1e+3)	(6.1e+3)	(6.1e+3)	(6.1e+3)
MaleHHH	1.1e+4***	1.1e+4***	1.1e+4***	1.2e+4***	1.2e+4***	1.1e+4***	1.1e+4***	1.1e+4***
	(3.5e+3)	(3.6e+3)	(4.2e+3)	(4.3e+3)	(3.8e+3)	(3.9e+3)	(3.7e+3)	(3.7e+3)
Household Size	2.5e+3***	2.5e+3***	2.5e+3***	2.5e+3***	2.7e+3***	2.7e+3***	2.7e+3***	2.7e+3***
	(436)	(449)	(437)	(449.08)	(494)	(512)	(495)	(495)
Constant	1.4e+04	-1.7e+4	1.3e+4	-2.2e+4*	1.7e+4	-1.7e+4	1.6e+4	1.6e+4
	(1.3e+04)	(1.3e+4)	(1.3e+4)	(1.3e+4)	(1.3e+4)	(1.3e+4)	(1.3e+4)	(1.3e+4)
Observations	967	976	967	976	932	941	916	916
R-squared	0.176	0.123	0.177	0.129	0.185	0.131	0.186	0.185

Notes: All fixed-effects regressions with robust standard errors on data from the NORC Conservancy Household Survey (2011 and 2014) and the CDSS Monitoring database (2010-2013). "(S)" and "(M)" refer to whether the data source is the former or latter.

Discussion of Key Findings

On average, there were no detectable impacts on a household's expenditure from the level of benefits received. However, we see results when we disaggregate by gender. Female headed-households experienced some increases in well-being from increased benefits—however, they still lag behind male headed-ones. Furthermore, inclusion of females in governance improved, but participation did not.

When looking at increases in well-being for the average household, we did not find a positive link between benefits or employment and expenditures. In fact, no matter how we measure benefits and whether we include them as a total per conservancy or as a within-conservancy household average, there does not seem to be any effect on household expenditure. Note there is still a correlation between household conservancy benefits and household income.

While the MCA-N interventions were not designed to address gender imbalances, our quantitative analysis demonstrates that increased benefits as well as employment have led to a greater increase in income and expenditures for women relative to men. These findings are in line with many of the qualitative findings around gender relationships, which indicate that women have experienced improved economic situations from employment. Both qualitative and quantitative studies find that this increase certainly has not closed gaps in inequities. However, the increase alone has led to some intangible benefits for some women, as well as gender relationships as a whole.

The focus of MCA-N programming around gender was the inclusion and participation of females in local governance. FGDs indicate that trainings for males around the importance of equal participation and females around public speaking has raised awareness and shifted perceptions about the role and abilities of women to participate. Qualitative findings further suggest there has been an increase of female presence in meetings where decisions are made; but despite this increased prescence and the improved awareness of female rights to participate, female participation in discussions and decision-making is still low relative to men. There are no quantitative indications that this situation has improved for women over time.

Tourism employment does not impact the average household in terms of incomes and expenditures—but leads to relatively higher increases for females than males.

In qualitative discussions, conservation leaders underscored that MCA-N interventions provided both monetary and non-monetary benefits to conservancy members. In some cases, leaders point out that non-monetary improvements to well-being such as empowering local governance or the application of knowledge and skills learned from trainings and technical assistance to non-conservancy related matters have, thus far, outweighed the monetary ones, although it is difficult to triangulate these less tangible benefits quantitatively. Conservancy members, however tended focus (in their FGDs) on the tangible (cash, meat, etc.) gains they have received from increased tourism employment rather than any non-monetary gains.

The quantitative analysis shows that full-time tourism employment has increased over the course of the evaluation period. As demonstrated in Research Question 3, our quantitative analysis also found that the increased presence of joint ventures has contributed to an increase in full-time employment of conservancy members. Similarly, an increase in conservancy business activity, as proxied by conservancy revenue, has raised full-time employment in the conservancy.

Despite the increases in employment, the both the qualitative and quantitative analysis acknowledge that the average household did not see much increase in *income* through conservancy activities. Quantitative analysis finds no positive or statistically significant relationship between conservancy outcomes (such as benefits or employment) and household income or expenditure. However, we see that in-kind benefits as well as tourism employment have led to greater increases in income and expenditure for female headed-households compared to male-headed ones.

4.6 Research Question: What have been the effects of game acquisitions on the conservancies and on their members? (RQ5)

- Reintroductions have had multiple benefits for game viewing, tourism/hunting, and enhanced biodiversity/ecosystem conservation, for even the most highly endangered species
- Increased game populations bring in predators; while this is beneficial for trophy hunting, the presence of predators are not appreciated by conservancy members
- Impact of common plains game species on crop damage may be underestimated

Qualitative Findings

Conservation leaders who have been involved in the conservancy program from the early stages named some of the strategic reasons, and potential benefits, of game translocations, including acknowledgements and rewards to rural communities for protecting their wildlife. Translocations of game from the state parks to rural communities communicates that the government has enough confidence in communities to entrust them even with high value species like black rhino, gets resources back into rural areas, and reinforces cultural values of wildlife. In addition, translocation promotes biodiversity conservation, including the reintroduction of species that have gone locally extinct, and speeds of recovery of game populations to create more income from trophy hunting and tourism and to increase meat production for locals.

An MCA-N manager stated that assistance was provided for the translocation of nearly 2500 head of game for the conservancy program since its inception. Analysing the impacts of translocation is difficult given the evaluation period of performance and the fact that many high value species take several years to reach the point where they can be marketed successfully. In addition, many Namibian conservancies are close to each other or border each other directly, which makes it difficult to know which specific conservancy is benefitting. However, tourism operators are quite positive on translocation, while the views of conservancies members are more mixed.

Impacts on tourism and trophy hunting

The owner of a safari hunting company who has had JVs with 11 different conservancies considers game translocation and the support that MCA-N provided a good, important initiative. He said that game viewing is important to his hunters and the variety of species available for viewing directly impacts his ability to sell packages: reintroducing new species that have gone locally extinct can have immediate positive impacts. Another high-end trophy hunting company owner said that game translocations into conservancies are crucial, especially where numbers have been reduced by consumptive hunting or habitats have been degraded. He also noted said that where over grazing has been a problem, you need to improve habitats before translocating the game.

When asked how long it takes for populations of reintroduced animals to build up to populations that can support a hunting quota, one owner noted that depends how many are introduced.. *"In Omantandeka, they have brought in black-faced*. *We now have quota on them after about 3 years. There are more than enough to support the quota. They reproduce quickly."* Some interviewed indicates it usually takes at least three years before a quota can be justified.

Respondents indicated that most of the species translocated do not have high value for trophy hunting. However, there was general agreement amongst conservation leaders, trophy hunters and an MCA-N manager that predator populations, which do have considerably higher trophy value, will build up in parallel with an increased population of the more common plains game. Such predators typically include lion, leopard and spotted hyena. One hunter said that conservancies can get NAD 200-400,000 per lion and NAD 40-70,000 per leopard. Another quoted conservancy revenue as USD 2.5 thousand per leopard and USD 15,000 for a lion. One conservation leader remarked that *both* the herbivores and the predators are very important: plains game, although is has a lower trophy value, is much more reliable for trophy hunting.

Impacts on local hunting

One point of agreement, however, is that the species translocated are very important for local hunting, both for "own use" and "shoot to sell." Quotas are negotiated between the conservancy management and the local Ministry of Environment officer based on the different forms of game count monitoring information available. Once the quota has been awarded, the conservancy is free to decide how they will use it – sell it to a safari hunting company , use it for "own use" or for "shoot to sell." For wildlife species that have low demand for safari hunting, the portion of their quota that conservancies allocate for "own use" and "shoot to sell" has grown very rapidly during the MCA-N program. However, local use has become very controversial, in part this is because local hunters usually shoot the largest top-quality animals and this negatively impacts the trophy quality of the given species population. In addition, shoot to sell animals are often shot out of vehicles, making the local anmial population more afraid of vehicles and decreasing their value for tourism.

Perceived value by conservancy members

One conservation leader believes the cultural, spiritual, and intrinsic values of game are very important to the people in the conservancies. During benefit planning in Caprivi, residents remarked, unprompted, that simply having the wildlife is a benefit. A second conservation leader says that people take real pride in having these animals back on their land, and are proud that the government has chosen their conservancy to release animals.

Crop and livestock damage, however, is raised as an issue by conservancy members. Although an MCA-N manager said that they do not translocate species that cause crop loss, conservancy members do not seem to agree, especially regarding crop damage caused by common herbivore species. The impact of predators on livestock is another issue. Predator populations increase with increasing herbivore populations, but it is not clear if this translatse into greater predation on livestock. One conservancy

leader referred to recent peer reviewed research on wild dogs that indicates that predation on livestock may not be a major problem as long as the herbivore populations remain high.

The members themselves expressed varying opinions. Nyae Nyae members approve of the translocations and would like to see them increased. Omantendeka members said they do not see any disadvantages. *"It makes the environment beautiful and it attracts the tourists."* Two Salambala and Uukwaluudhi members see a mix of advantages and disadvantages. They cited similar advantages of the translocations, but added *comments such as "About the disadvantages are, they are destroying our fields."* and *"I would increase (the translocations) but I would increase the ones that are not bringing the damage to the community."*

4.7 Research Question: Do technical support and grants to conservancies increase business partnerships between conservancies and private businesses, and, in turn, increase conservancy revenue? (RQ1)

- There is strong agreement that JV grants for lodges has been the core support for business partnerships and key strength of CS program by addressing key constraints to private investments through innovative and professional means
- SME grants have high transaction costs for modest benefits
- Game translocationsare expensive, but results should be highly sustainable as long as conservancies remain viable
- HWC grants could have benefitted from higher level of technical expertise

Qualitative Findings

The evaluation of the impact of the MCA-N support for business partnerships must be analysed both at the level of the specific activities directly targeting these partnerships, especially the grants program, but also in the much broader sense of the support for the overall capacities of the conservancies to negotiate and sustain these partnerships. This chapter focuses on the impacts of the grants program on the development of the business partnerships. The overall capacities and sustainability of these partnerships are addressed in section 4.8.(RQ6).

Conservancies have developed partnerships with lodge owners/operators and with professional trophy hunting companies. These partnerships lie at the heart of the conservancy program because they generate by far the lion's share of the revenues for the conservancies and, therefore, a large part of the incentives for conservancy members to support the conservancies. We will look first at the effectiveness of the grants program in respect to its impact on the business partnerships.

MCA-N grants and technical support included:

a) Grants to conservancies in support of JV partnerships for tourism and lodge development
b) Game translocations and accompanying support
c) Grants to reduce Human Wildlife Conflicts (HWC)
d) Grants for Small Medium Enterprises (SME) in the conservancies
e) Grants for tourism marketing with a focus on North America

Ranking of impact of grants and technical support on business partnerships

JV grants for lodges There is broad agreement in the qualitative interviews that grants for JV lodges has been one of the most successful aspects of the MCA-N support to conservancies and is a key strength of the grants program. Although some other donors have provided similar support, none have supported lodges in such a thorough and professional way or at such a scale. Three of the main constraints faced by private investors to investment in lodges are: (a) the leases that must be granted by land boards (foreign investors cannot own land in rural areas and therefore must seek other means of securing land

rights before making their investments), (b) the awarding of exclusive concessions in national parks in favor of tourism investments, and; (c) the environmental clearances that are necessary. The MCA-N program has dealt quite effectively with all of these constraints in addition to their support for the JV partnerships between investors and conservancies.

JV grants go to the conservancies rather than to the investors and have significantly increased the returns to conservancies according to KIIs although conservancy managers have rarely recognized this in the FGD. MCA-N has been flexible over time in increasing the percentage of the total investment that is covered by the grant, increasing in increments from an initial 25% to the final level of 49%. The KIIs indicate that this has definitely made the crucial difference to many investors as to whether or not to make the investment in JV partnerships with conservancies.

Investments in JV tourism lodge development generate much greater levels of employment for conservancy members than do JVs for the hunting sector. Investments in lodges are of high cost, and the MCA-N grants and assistance has made a critical difference. Most conservancies also have JVs with professional trophy hunting companies, but this sector has received very little support from MCA-N, even though trophy hunting has recently edged out lodge-based tourism in recent years as the principal source of revenues for conservancies. It is generally considered by most people interviewed that trophy hunting does not require substantial investments. A professional hunter said that the recent trend is a return towards hunting camps rather that hunting lodges. One owner of a safari hunting company took issue with the idea that capital for investments is not a significant constraint, arguing that the "high end" clientele, to which he caters, demand hunting camps that do require substantial investments.

Donor support for hunting is also a highly emotional and politicized issue. This was clearly demonstrated by the auctioning in the US of the rights to hunt a black rhino. This generated an incredible level of negative publicity and even death threats directed towards the highest bidder. Many, if not most, donors will not support the hunting sector, and it seems that MCC has not been immune from such pressures. There is also a generalized anti-utilization movement towards renewable natural resources in general. This is certainly seen in the forest sector where community forestry initiatives rarely involve the harvest of live trees.

KIIs with professional hunters indicate that the hunting sector suffers from some unprofessional operators that hurt the the sector's reputation. There may have been opportunities for other types of assistance towards JV partnerships with trophy hunters and towards improving the professionalism of the trophy hunting sector. The actors in the conservancy program have traditionally viewed hunting as a natural resource issue and have only recently come to view its importance as a business sector and as the object of JV partnerships with conservancies. The MCA-N-funded Implementing Entities are now working on updating the standard template for contracts between conservancies and safari hunting companies.

Game translocations We have seen from the previous research question that grants for game translocation are viewed very positively by both tourism investors and by trophy hunting companies. Game translocation is relatively expensive but it clearly will have long lasting impacts on JV partnerships for both photographic tourism and safari hunting for as long as the conservancies remain viable and wildlife stocks are maintained. It also has very significant cultural and social benefits that are generally highly appreciated by conservancy members.

Human Wildlife Conflict (HWC) Grants probably have had relatively small impacts on the development of business partnerships. One conservation leader believes that HWC is one area that has not received the level of inputs of technical expertise and "evidence-based approaches that it should have." Neither the KII nor the FGD indicate that positive impacts on HWC have been that substantial. Hardening of water points works relatively well, but efforts to protect farm fields from crop damage do not seem to have been as successful.

Small Medium Enterprises (SME) Grants have probably had relatively little impact on business partnerships. Such grants have mostly covered the development of crafts and of craft centres and community-managed camping sites. The development of a "living museum" with the San is considered by several to be a highly innovative and very successful initiative. SME grants have generally had high transaction costs; one person interviewed described them as having "huge transaction costs". The ability of the beneficiaries to meet the requirements for a grant proposal is very minimal and the Implementing Entities have had to make major investments to support these grant applications.

Perhaps their greatest strategic contribution of SME grants to the conservancy program is that craft development provides one of the rare opportunities for households to earn revenues directly based on their own efforts. Craft development has almost exclusively benefitted women. The harvest of INPs in a number of conservancies is one of the other such opportunities for household. We have seen that it has been difficult to ensure that substantial benefits get down to the household level and this may be one of the key strategic weaknesses of the conservancy program in Namibia.

Grants for marketing. Everyone who commented on these grants agrees that it is very difficult to evaluate the impacts of these grants. The opinions on the relevance of these grants vary significantly. Some think that the potential of the North American market that was targeted is rather marginal. If these marketing grants do have significant positive impacts, however, they may also have more positive impacts on the business partnerships than the grants for HWC or SME.

4.8 Research Question: How sustainable are the results of business partnerships in terms of increased employment and improved mechanisms for distribution of revenue? (RQ6)

- Southern African CBNRM is unique in its dependence on capacity of communities to negotiate and implement business partnerships. Conservancies will require ongoing support for the indefinite future, as tourism partnerships are complex.
- While trophy hunting is on a rapid decline in Africa, many think Namibia and South Africa will outlast others.
- Threats to sustainability of conservancies include: maintenance of adequate levels of good governance, demographic growth, human wildlife conflict, economic downturns, and risks linked to government programs.

Qualitative Findings

Sustainability of the business partnerships

The sustainability of the business partnerships revolves around the critical capacity of conservancy managers to negotiate and implement JV business partnerships for tourism and for trophy hunting. In the CBNRM sector, community-based wildlife management in southern Africa is probably unique in its strategic dependence on the ability of community managers to negotiate and maintain such business partnerships. Few other CBNRM initiatives are so heavily dependent on such partnerships; for example community-based dryland forest management in West Africa does not generally involve such partnerships but rather simply requires investors follow approved forest management plans, respecting the various contractual obligations defined in their contracts with the government owners of the forests.

The capacity to develop and implement JV partnerships with sophisticated, often foreign business partners is obviously a very different challenge. As one conservation leader said, "*We (the conservancy program) put in more money into institutional capacity and support than any other part of the program*." As the MCA-N CS program draws to a close, this capacity support is perceived as still needed, and furthermore it is perceived that it will be needed into the foreseeable future. Conservancies need capacity not only to negotiate JV partnership contracts, but also need capacity to maintain and to implement these partnerships. But this capacity is seen by most as lacking.

In particular, partnerships with tourism/lodge investors can be complex, especially compared to the partnerships with trophy hunters where the contractual conditions are relatively simple. (The length of trophy hunting contracts is generally for less than a half dozen years, and payment schedules are usually relatively simple, making implementation much easier.) The capacity of community-managers to negotiate and implement lodge-based tourism contracts is not only more difficult, but important: such contracts are generally for a much longer period of time, in the neighbourhood of 20 years, so getting them right is much more critical than it is for hunting contracts. Most conservation leaders recognize that community-managers will definitely need ongoing support for the negotiation of contracts with

tourism investors for the foreseeable future, but they think it is a manageable challenge: contracts that are only renegotiated every 20 years and as such do not require a heavy investment in support services.

A much greater challenge is to define and to meet the challenge for the support services necessary for conservancies to *maintain and implement* their JV partnerships, especially with JV tourism operators.

There seems to be a fairly general agreement amongst conservation leaders and Implementing Entities on this need. When one looks at the results of the FGD, nearly all conservancy managers recognize their need for ongoing support when asked if they could stand on their own if all Implementing Entity support were to come to an end.

One conservation leader stated, "*We have had external audits done on all of the conservancies. Once you get into the more complex aspects, the conservancies really, really struggle*." He goes on to say, "*Audits find no evidence for the basis for the payments made to conservancies. It is based essentially on trust. It is inconceivable to me that the conservancies can take the payment schedule, seek the relevant information from the JV partner, look at payments made and reconcile the two. We can't do it even with our present support*." Two conservation leaders pointed out that even the NGO supporting the conservancies rarely have the proper entrepreneurial skills for best supporting the capacities needed for these business partnerships.

A major constraint to the development of the capacities needed is a constraint that is inherent to CBNRM: community management committee members must go up for re-election every few years, and they are frequently replaced by new members without experience and training. This creates an ongoing need for training for the new members. One option for circumventing this is the hiring of professional managers. One conservation leader said that nearly all of the MCA-N supported conservancies have hired paid coordinators or managers but they are almost invariably local hires, but without the qualifications and the expertise needed -a sentiment repeated by others who were interviewed. Some felt that skilled professional managers could greatly increase conservancy revenues that could easily justify their costs, but this option that remains untested.

Options for providing ongoing support services

One of the greatest strengths of the conservancy program in Namibia is the strong, ongoing support from Namibian NGOs. This support was developed before the development of the MCA-N assistance and a good portion of it will almost certainly continue beyond the end of the MCA-N assistance. Most people interviewed, however, believe that the future funding will not be of the same magnitude as MCA-N's funding; after it ends, some of the current Implementing Entities may continue their support to the same conservancies, perhaps at a lower level, and some of the geographic areas currently supported may go without funding, at least for a period of time.

MCA-N has supported the creation of a trust fund that would finance ongoing support services to conservancies. Opinions vary as to the level of funding that will be mobilized for this and the adequacy of the support services that it will be able to fund.

The other major untested method of providing support services to conservancies is to set up these support services on a self-financing basis under the direction of a professional business manager. Some conservation leaders feel that there is good potential for professional business managers to generate considerably more new revenue for the conservancies. Such managers could mobilize or contract for other support services as needed. One example of self-financing support services is known from Burkina. It was set up by an Food and Agriculture Organization community-based dryland forest management project between 1987 and 1993. For pragmatic reasons, the geographic area covered by the local community management groups are relatively small – around 3000 hectares of forest per management group. A varying number of these local groups are federated into a second tier management structure. Each one of the six upper tiered structures employs a university graduate forester, an extension agent, an accountant and a clerk. Their main function is to provide support services to the local community management committees. Such a management structure might be adapted to the conservancies in Namibia.

The sustainability of business partnerships between conservancies and tourism operators and trophy hunters is, of course, dependent on the sustainability of the conservancies themselves as well as the viability of the tourism and trophy hunting sectors. These other risks to sustainability are outlined below

Demographic growth and competing land uses

Demographic growth generally goes hand in hand with increasing pressures on the land and resources including the development of competing or incompatible land uses. Some key informants believe that demographic growth will not endanger the conservancies as long as there continue to be high rates of movements of rural people to the cities.

The professional trophy hunters interviewed, in particular, are very concerned about increasing numbers of livestock competing for grazing resources and more ore land being converted to agriculture, especially in Caprivi.

Human wildlife conflicts

Growing HWC seems to be a definite threat and a clear concern to many, if not most, conservancy members. The FGD seem to indicate that most conservancy members will tolerate HWC if they receive at least partial compensation for their losses and if they are receiving clear benefits from the conservancy. The FGD made it clear, however, that benefits do not always reach the household level.

Human deaths from HWC are especially problematic, receive much more publicity than crop damage of livestock loss and pose a special risk to conservancies. The two wildlife species that most commonly cause mortality are elephants and lions; human mortality from predators such as lions seems to be especially traumatic. One conservation leader spoke of the dramatic increase in lion population in the northwest: this is a great conservation success story but could lead to much greater HWC. In the opinion of this conservation leader, even if 2 or 3 people were killed by lions, however, he/she believes the lions would be killed and the conservancy program would go on.

Economic downturns

The major world-wide economic downturn of 2007 to 2009 was a major shock to the tourism sector, including in Namibia, and there are inevitably risks of future such shocks. There is a general consensus that the photographic tourism sector is much more susceptible to economic downturns than the trophy hunting sector , but nearly everyone believed that high-end tourism is much less susceptible than the general tourism sector.

Faulty wildlife management

The viability of the conservancies is clearly dependent on the maintenance of viable, healthy wildlife populations. The conservancy program has invested a great deal in the monitoring of game populations and this is an area where the Ministry of Environment play a particularly strong role. Most people interviewed believe that quotas are generally being respected and that there are quite robust systems in place for monitoring game populations.

Shoot to sell is a relatively new development in conservancies and there is a considerable level of concern that game populations may be suffering from this, especially the tendency to harvest the largest animals in the herd and the practice of shooting game from vehicles, making them afraid of vehicles and much less visible to tourists. Some are concerned that quota for shoot-to-sell and own-use may not be respected. Conservancy support agencies are actively working on solutions to these problems.

Risk related to government agencies, programs and capacities

There are a number of risks to conservancies that are linked to government agencies, programs and capacities. There have been initiatives from the Ministry of Lands and Ministry of Agriculture to privatize conservancy lands in favour of private farms or ranches. Conservancies are sometimes viewed as a "cash cow" that government agencies can tap into. The Ministry of Lands is seeking to levy a new tax of 5% of the gross income of tourism lodge operators. The sector is already quite heavily taxed and it is not at all clear that the sector can support this new tax.

Portions of Nyae Nyae Conservancy have been fenced by private interests, cattle owned by non-members are pastured in the conservancy and there is ongoing poaching by outsiders. The Ministry of Environment has not dealt with these threats. The MET should be taking a much more active role in the oversight and support for conservancies, attending AGM, monitoring annual financial statements, participating in joint meeting with JV partners and the like, but they have very limited resource to meet these obligations. The conservancy program is under the MET and several people interviewed consider the MET to be a relatively weak ministry.

The conservancy program may well be the most successful natural resources management program in Africa, but it still suffers from one of the major constraints that nearly all CBNRM programs suffer from – the lack of sectorial integration at the community level. Existing legislation does not make it possible for a community to be empowered to manage all the renewable resources (wildlife, forests, range, water)

on their lands under a single agreement with government. Community forests are controlled by a separate ministry under separate legislation from those of the conservancies and there is no movement to integrate the two. The boundaries of community forests rarely coincide with the boundaries of conservancies. Often, separate, largely parallel, community institutions are created for each. The situation is unnecessarily confusing and inefficient.

5. Key Take-Aways and Limitations of the Evaluation

Governance. Key governance constraints that were present prior to the MCA-N program include lack of accountability, insufficient information sharing, insufficient capacity, lack of member awareness of rights, and lack of respect for quorums at AGMs. Although there is strong consensus amongst conservancy management and conservation leaders that the governance training and technical assistance is a key strength of the MCA-N program, not all conservancy members agree that governance has improved, or that it is at an acceptable level. Most notably, while conservation leaders cite improvements in financial accounting and reporting, conservancy members express concerns around transparency and decision making. Unfortunately, there is not enough data available to triangulate these claims with quantitative analysis. While it is true that governance, as measured by indices complied by CDSS, have gone up on average between baseline and endline, and has increased across most conservancies, we are unable to definitively link these changes to the provision of MCA-N assistance. This is partly due to the lack of systemized training data between 2009-2011. However, we do see a link between MCA-N assistance, including trainings and technical assistance, and more equitable distribution of benefits—an important component of improved governance.

Equitable distribution of conservancy benefits. Qualitative analyses did not find significant issues of equitability in the distribution of meat or cash benefits. Both qualitative and quanitative analyses find that the greater the number of members in a conservancy, the more equitable the distribution of in-kind benefits; the greater the geographic area of the conservancy, the less equitable the distribution of benefits. Trainings and technical assistance are associated with increased equality of the distribution of benefits. However, there continues to be a significant lack of transparency on conservancy income and how it is used. Results show that higher governance scores are associated with slightly increased inequality of the distribution of benefits within a conservancy, even after correcting for issues of endogeneity. Lack of 2009-2011 training data, as well as systemized data on the spending on public goods, may be driving this counterintuitive finding.

Employment. The number of JVs in a conservancy, along with the overall level of business activity in the conservancy, has a positive effect on full-time employment. The number of SMEs in a conservancy, however, seems to have little effect on employment. With available data, there is no detectable relationship between trainings/technical assistance and conservancy business. However, JV grants have been noted as a key strength of the CS program by addressing key barriers to private investment.

Distribution of benefits by gender. Benefits going to female-headed households increased over time. Female headed-households are experiencing relateively greater increases in expenditure and income than males due to benefits. Nonetheless, levels of expenditure and income for female-headed households still lags behind those of male-headed households. However, higher conservancy governance scores are associated with smaller shares of benefits distributed to female-headed households—a counter intuitive finding. The effect of training and technical assistance on the share of benefits to female-headed households is mixed.

Recipient-household gender relationships. Improved gender relationships often results from the improved economic situation of women and their ability to contribute revenue and food to the household. Women and men report that the trainings and other assistance from their service provider have helped them gain respect in their households. Quantitative analyses demonstrate that tourism employment leads to relatively higher increases in incomes and expenditures for female-headed households than male-headed households. Still, although significant progress has been made, many problems of tangible (e.g. income, employment) and intangible (e.g. representation of views in democratic forums) gender inequity persist.

Household well-being. Conservation leaders tend to emphasize gains in non-monetary aspects of well-being, including a greater sense of empowerment, increased control of land and resources, increased respect, and increased cultural values of wildlife. Conservancy members, however, emphasize monetary aspects of well-being, most prominently income, employment (including the sale of crafts), and food. While the average household has not seen major improvements in well-being from tourism and benefits distribution, female headed-households are seeing increases in expenditure and income attributable to employment and benefits. However, females still have a lower average income than males, all else equal.

Game acquisitions. Reintroductions have had multiple benefits for game viewing, tourism and hunting, and enhanced biodiversity/ecosystem conservation. These reintroductions seem to be working well for even the most highly endangered species. However, increased game populations bring in predators; while this is beneficial for trophy hunting, the presence of predators is not appreciated by conservancy members. The impact of common plains game species on crop damage may be underestimated.

Grants, technical support, and increased business partnerships . There is strong agreement that JV grants for lodges have been the core support for business partnerships and served as a key strength of program by addressing constraints to private investments through innovative and professional means. SME grants, however, have high transaction costs for modest benefits. Game translocation is expensive but results should be highly sustainable as long as conservancies remain viable. HWC grants could have benefitted from higher level of technical expertise.

Sustainability. Southern African CBNRM is unique in its dependence on the capacity of communities to negotiate and implement business partnerships. Conservancies will require ongoing support for the indefinite future, as tourism partnerships are complex. While trophy hunting is on a rapid decline in Africa, many think Namibia and South Africa will outlast others. Other threats to sustainability of conservancies include: maintenance of adequate levels of good governance, demographic growth, human wildlife conflict, economic downturns, and risks linked to government programs.

Limitations to the Evaluation

In the quantitative analyses, methodological and data limitations include too few observations, especially with regards to the monitoring data. Most analyses required 2013 data, and CDSS did not release its latest data until September 2014. Where data was available, especially in 2010/2011, the data tended to suffer from measurement error. Some data that NORC thought would be available when it was planning the design of the evaluation was not available after all, or did not produce any conclusive

findings. The lack of available data limited options for the model to control for other factors that may have systematically affected outcomes (issues of endogeneity). It is also important to note that the evaluation period was short, and in some cases the program (treatment) was not in place long enough to pick up any effects.

In the qualitative analyses, KIIs were unable to be arranged with any key informants from the Ministry of Environment during either 2013 or 2014 field visits. Finally, there was also difficulty recruiting FGD moderators with local language skills and expertise in community-based wildlife management.

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IV. THE INP EVALUATION

1. Activity Overview

Background on the INP Sector

The harvesting of natural resources, mostly from plants, for their nutritional and economic value, forms an important part of the livelihood system of many rural households in Namibia. Given Namibia's marginal agro-environmental conditions, their value to these rural households is high.

In the mid-1990s, the demand for Namibian Indigenous Natural Products (INPs) gained momentum when Namibian stakeholders developed and refined an innovative and coordinated approach to creating economic opportunities based on harvesting, processing, and trading INPs. In 2000 the early success of this approach was used as a foundation to design the Ministry of Agriculture, Water and Forestry's Promoting Indigenous Fruit (PIF) project, which in turn resulted in the formation of the Indigenous Plant Task Team (IPTT), a multi-stakeholder coordinating body chaired by the Directorate of Agricultural Research. Organizations that have been involved in the INP sector for many years include the Natural Resources Institute (NRI), the Centre for Research, Information, Action in Africa Southern Africa-Development and Consulting (CRIAA SA-DC), Integrated Rural Development and Nature Conservation (IRDNC), and Namibia Nature Foundation (NNF).

This approach has so far brought four Namibian natural products (Devil's Claw, Marula, Kalahari Melon Seed and *Ximenia)* to international cosmetic markets, with several others at various stages of development (mainly Commiphora and Mopane).

Most primary INP harvesters are some of the poorest and most marginalized people in Namibia. They are cash-poor and have little access to commercial inputs or post-harvest infrastructure. They are isolated with very limited contact with markets. Even some people who are relatively wealthy based on their livestock assets have limited access to cash and liquidity because of their remoteness and lack of readily accessible livestock markets. INP harvesters depend on "traditional" technology and practices. INP harvesters are almost entirely women and operations typically depend on hand labour. Women dominate the sector, accounting for almost all of the raw materials produced, harvested, and collected. Harvesters are typically organized into Producer and Processor Organisations (PPO) whose role is to act as an intermediary between harvesters and buyers by weighing, gathering and selling the products. These PPOs may be independent groups of harvesters or may exist within the management structure of conservancies in which case conservancy management committees also manage the PPO. In some cases, PPOs also own their own processing facility, such as the case of Eudafano Women's Cooperative (EWC) for Marula.

The markets for each resource (product) appear to have particular characteristics. In some cases a small number of exporter-buyers have a degree of oligopoly power. Additionally, price-setting regimes clearly differ among resources, exporter-buyers, and contracts facilitated by different service providers. In the case of Devil's Claw (*Harpagophytum procumbens* and *Harpagophytum zeyheri)*, one major exporter-buyer signs contracts with PPOs. The exporter-buyer differentiates between conventionally and sustainably produced Devil's Claw, and pays a higher price for the latter. On the other hand, for a

particular species of Commiphora (*Commiphora wildii*) unique to Namibia (and possibly Angola), a fixed price is set by the involved PPOs with NGO technical assistance. Prices offered for most resources are sensitive to exchange-rate movements because the Namibian exporter takes the exchange rate risk.

Expansion of some overseas markets is constrained by existing and evolving regulations as well as the costs and effort associated with compliance. International demand for INPs has also proven to be volatile on a year-to-year basis. In short, INP product markets are complex. One implication of these various attributes is that we have found it appropriate to address some evaluation questions on a product-by-product basis.

Description of the target INPs: history, products and market characteristics

The MCA-N INP Activity focuses on five INPs: Commiphora, Devil's Claw, Marula, Mopane and Ximenia. The evaluation of the INP Activity includes all INPs except for Mopane. Marula and Ximenia trees are commonly found in southern Africa and in northern Namibia, while the Commiphora shrubs are found in north-west Namibia in the Kunene Region. Marula and Ximenia seeds are both pressed to extract essential oils that can be used for cosmetics. Marula oil is also used as a food oil and the fruit itself can be pressed to make marula juice and wine. For Commiphora, an essential oil is extracted from the naturally exuded resin. Finally, Devil's Claw is a leafy perennial plant whose tuber roots are used for medicinal purposes.

All four INPs are commonly found in their respective harvesting areas and the plant parts commercialized can be harvested using non-destructive harvesting practices, one of the key components of sustainability for these INPs.

Of all four INPs, the Devil's Claw value chain is the most developed, followed by Marula. The market for these two INPs are fairly well developed; they are both commercialized internationally. Ximenia and Commiphora are newer INPs with less organized supply chains and more emerging markets. Marula, Ximenia and Commiphora all started being commercialized only after 2005, and annual production levels have shown great variation due to changes in market conditions.[43]

According to the Baseline Desktop Study done by NRI, for all INPs except Devil's Claw, "the sustainable commercial supply potential is one or several orders of magnitude higher than current commercial harvesting and production rates. It is not resource availability but other factors (such as availability of harvesters, logistical challenges and efficient organization of the supply chain) that may pose constraints to scaling up resource supplies. It is highly unlikely that during the 4-year implementation of the Sub-activity (or in the foreseeable future beyond the completion of the project) market demand for INPs would rise to such an extent that it could come close to the supply potential and potentially lead to (over-)harvesting."

[43] Source: Baseline Desktop Study 2010, NRI.

Below we provide more information for each of the INPs.

Commiphora

The variety of Commiphora harvested for commercial purposes, *Commiphora Wildii*, naturally exudes resin without the need for cutting the bark when temperatures increase during the dry season. It is this resin that Himba women in Kunene have traditionally harvested for years and used as a source of perfume. Initial research into the utilisation of Commiphora resin, also known as oak-leaved Corkwood resin, started in 2004 and led to the first commerciall harvest in 2007. IRDNC initiated PPO support in Kunene at that time and received a grant to build a distillation facility for essential oils. The facility was built and equipped, but it was not operational when the MCA Namibia INP Activity started. One international company showed interest in the oil and financed the necessary safety dossier in order to enable international marketing of the product.

According to NRI's Baseline Desktop Study[44], the first commercial harvest of 2007 produced five tons of resin and the second harvest of 2008 produced six tons of resin. Harvesters were paid $50/kg. However, NRI estimated that the sustainable supply potential of Commiphora could reach 50 tons per year. Commiphora is harvested within five conservancies, Orupembe, Sanitatas, Okondojombo, Puros and Marienfluss. The conservancy management committee of these conservancies also manage their respective PPOs.

Devil's Claw

Devil's Claw is an INP that has been used by the indigenous population of Namibia for many centuries and that has been harvested and processed for commercial purposes for many years before the INP Activity. It is a popular raw medicinal material in Europe; it was first registered as a drug in 1978 in Germany. Since then, the demand has been rising continuously and as a result Namibia, as the world's largest producer of Devil's Claw, was able to increase its export to a record high of 851 dry tonnes in 2002.[45] This level has not been reached since then and the average export in Namibia has levelled off at 450-500 tonnes per annum (t/a). The Devil's Claw market is characterized by large annual fluctuations which may be explained by the stocking policies of major buyers, changes in market participation of other resource countries such as Botswana, South Africa, Angola, Zambia or Zimbabwe and the desire of traders to maintain a broad purchasing base.

The Government of Namibia has recognised the potential threat of overharvesting the resource base early on and adopted protective regulations and enforcement measurements like harvest permit

[44] Retrieved from http://www.mcanamibia.org/files/files/PDFs/INP%20Docs/INP%20PPO%20Desktop%20Baseline%20Study%20of%20MCA-N%20INP%20Target%20Species.pdf

[45] Source: MCA-N reviewer.

systems including quotas. Likewise nine PPOs[46] in selected areas (mainly northern and eastern Namibia) received support by CRIAA SA-DC, IRDNC and NNF in order to establish sustainable harvesting schemes and to build up their management capacity since the late 1980's. According to key informant interviews conducted by NORC, before the MCA-N project started, the share of premium quality material (as defined by low contents of adulteration and of inferior material as well as traceability of the geographical origin) was around 10% of the total production volume. Some of the material was also marketed as organic (50 – 60 dry t /a). However, in many other regions of Namibia, for instance Zambezi where 8-12 dry t/a were harvested before the project, wild harvesting was uncontrolled and all the material was of conventional quality which means a higher share of unwanted constituent parts and impurities. Due to a lack of organisational structures it was not possible to locate the specific source of the raw material. Furthermore, it was a common practice among exporters to combine batches of material although this practice is not allowed.

Marula

Similar to Devil's Claw, activities related to Marula harvesting and processing existed in Namibia before the INP Activity started, and in fact marketing activities of Marula oil started as early as the 2000's when it was first exported commercially. The Marula PPO, Eudafano Women's Cooperative (EWC), was formed in 1999 and has been supported by donor, private sector and government funding. With a membership figure of around 1,000, EWC was processing 10 – 15 tons per annum of kernels per annum in the 2000's, which yielded approximately 3.4 tonnes of oil that is commercialized locally and internationally. The quality of the oil was sometimes affected by contaminations and processing related defects. EWC as an organisation faced a multitude of problems concerning supply, technology, management and overall structural systems. The major bottleneck in the production line was the cracking of the nuts as this step is very labour intensive especially given the lack of adequate cracking tools (no real effective and efficient tool has been created to date). Compared to Marula oil, other by-products from the Marula fruit have not been commercialized as extensively. According to the Desktop Baseline Study conduted by NRI[47], EWC had a membership of about 5,000 harvesters by 2010 in 22 associations in the north-central Regions of Namibia (Ohangwena, Oshana, Omusati, Oshikoto).

Ximenia

Ximenia Americana the target species of the INP Activity is one of the most common woody species in Namibia as it grows in many different habitats in the central and norhtern parts of Namibia. The kernel oil of *Ximenia americana*, also known as blue sour plum, is a relatively new product on the market. Since the turn of the millennium it started to raise interest at a low but ever increasing level. Shortly before the INP Activity started, the utilisation of Ximenia oil was at its peak. In 2008, a total of 14.6 tonnes of oil were extracted and sold to Aldivia, a French company specialized in the commercialisation of plant-

[46] Note that at this time the organizations were not neccesiraly defined as 'PPOs'

[47] Retrieved from http://www.mcanamibia.org/files/files/PDFs/INP%20Docs/INP%20PPO%20Desktop%20Baseline%20Study%20of%20MCA-N%20INP%20Target%20Species.pdf

based oils. The oil specifications had been developed and the product was established on the European market. However, the producer groups were generally still disorganised and any form of standardising or certification was difficult. The main PPO for Ximenia is Tulongeni Twahangana Cooperative (TTC) which includes associations from around the Eenhana, Ohangwena Region. The Ximenia seed oil market is a niche market with exports mostly going to France.

MCA-N INP Activity

The INP Activity has three sub-activities:

1. Support to Producer and Processor Organisations (PPOs), including both training and grant support through Primary Production Improvement Grants (PPIG);
2. Delivery of market information on INP products and market data through the National Botanical Research Institute (NBRI); and
3. Provision of an INP Innovation Fund[48]

The goal of the PPO sub-activity under the INP Activity is to increase economic opportunities for INP stakeholders through four areas:

1. PPO organisational development
2. Development of PPO competence in business and marketing principles[49]
3. The application of technical improvements to INP processing and/or refinement
4. Introduction and wider diffusion of sustainable harvesting practices (mostly in the case of Devil's Claw) and of practices to attain organic and fair-trade certification

Assistance to PPOs is led by the Natural Resources Institute (NRI), University of Greenwich. It has contracted three service providers for delivery of services to the PPOs: CRIAA SA-DC for North Central and country-wide Technical Support, IRDNC for Kunene and Zambezi and NNF for Kavango.

The application of technical improvements in Point 3 is described by NRI as referring to the application of technology to improve harvesting and the processing and preparation of products for the market. These improvements are realized through technical training in simple processing techniques and quality management, as well as upgrading to higher value streams through the application of simple technical solutions. The INP activity is expected to increase incomes for an estimated 7,000 primary harvesters

[48] This description is a slightly edited version of that in Section 2.2 in the RFP for the evaluation project issued by MCA-N.
[49] A big part of this is not only the training but also assistance with contracts with buyers and the marketing.

and their households, benefitting a total of about 35,000 individuals.[50] An important aspect of the INP activity is not just generating income for the rural poor but to do so in accordance with an "access and benefit sharing" approach, as the more a PPO harvests the more individual harvesters benefit.

INP Activity Program Logic. For the PPO component, the intervention begins with harvesters who are part of a PPO. Training and assistance can go directly to harvesters, as is the case with sustainable harvesting techniques, or to PPO management, as is the case with the PPIG grants which are in-kind grants providing equipment, facilities or services to the PPOs. Harvesters collect/harvest the INP which in some cases then undergoes a small amount of processing at the harvester level, for example decortication in the case of Ximenia and slicing in the case of Devil's Claw. In other cases there is no processing at this level or processing is done at a separate site, for example with Marula at the Eudafano Women's Cooperative which presses, cleans and packages the oil. The next step in the process is developing or strengthening markets for each product to ensure the INP can be moved through the value chain.

The INP Activity was designed to impact each point in this chain:

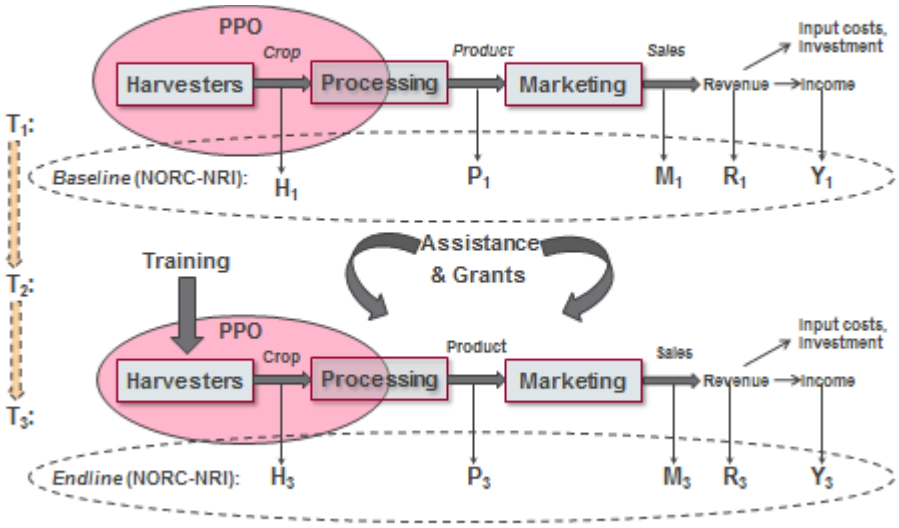
1. Harvesting – through training
2. Processing – through training, PPIG grants, and the Innovation Fund (in reference to developing more efficient processing and refining techniques)
3. PPO – PPO level trainings, facilitation of buying agreements and assistance to help harvesters work together to receive the best prices for their goods, and institutional assistance and strengthening.
4. Marketing – To develop new markets for INP and strengthen existing markets.

The end goal of the intervention is to ensure that harvesters receive more income from harvesting INP, the resource is sustainably harvested (especially Devil's Claw) and that the PPO structure is sustainably managed over time. A secondary goal of the activity is to ensure that historically marginalized groups, such as women and minority ethnic groups, benefit from the intervention. It may be the case that as INP revenue increases, men will insert themselves into the process in order to benefit from the new revenue stream. Although these goals are most likely reachable, the time frame for the evaluation may not be long enough to capture large-scale changes in income or sustainability. Therefore it is also important to consider possible shorter-term successes such as increased INP sales, gender empowerment, the development and fielding of new and innovative processing techniques, and increased harvesting yields when assessing the impact of the INP intervention.

[50] MCA-N M&E Plan 2012 and 2013.

Figure 10 presents the MCA-N and NRI program logic. The MCA-N's evaluation logic will be based entirely on this underlining program logic and builds a framework for measurement of change that fits within a shared understanding of that logic.

Figure 10: The MCA-N and NRI program logic for the INP Support Activity



2. Methodology

As explained previously, we use a mixed-methods approach in which qualitative data is complemented by quantitative analysis. Depending on the evaluation question, either qualitative data alone or quantitative data and qualitative data together were used for the analysis. The qualitative data come from KIIs and FGDs. The quantitative evaluation of the INP Activity consists of a before-and-after approach, without a control group. To estimate the effect of INP activities on the different outcomes of interest, we use the widely known fixed-effects model. More specifically, we exploit the fact that we have baseline and endline data for the same households (in other words, we have a household panel), and include household fixed effects in all of our outcome regressions. This model controls for any observable or unobservable characteristics that may confound the treatment effect, as long as these characteristics are time-invariant.

In addition, in all regressions we also include propensity scores for treatment participation at each round of data collection. To do this, we first model treatment participation (in general, the number of training sessions a household participates 12 months before collection), as a function of key sociodemographic indicators at the household level, namely household head gender, age and education, as well as household size and type of INP.

For the INP quantitative analysis, in our most saturated specifications we include as covariates variables estimated in first stage regressions. We realize that, ideally, in this context the standard errors should be bootstrapped; however, given the small samples in some cases we decided to present standard errors clustered at the household level. For each regression result we specify the type of standard error that was calculated. It is worth noting that the differences between the two approaches (when bootstrap was feasible) were very small.

3. Data Sources

Focus Group Discussions. A total of 40 FGDs were conducted with members of PPOs. For the midline data collection, 12 PPOs were selected to cover a wide range of PPO characteristics such as geographic location, implementer, and institution type. For each PPO, two focus groups were conducted: one with the members of the management staff and one with members who did not hold a management position with the PPO, bringing the total of midline INP FGDs to 24. For the endline data collection, 8 of the original 12 PPOs were re-selected, and similar to midline, FGDs were conducted with management and non-management members, bringing the total of endline INP FGDs to 16.

Table 40. PPOs sampled for FGDs

INP[(a)]	Name (NRI #)	Region	Implementer	No. of harvest-ers[(b)]	PPIG[(c)]	Economic power (N$) [(d)]	Midline Sample	Endline Sample
X	Eenhana (part of Tulongeni) (35)	Ohangwena	CRIAA SA-DC	744 (TTC)	Yes	9,757	X	X
CM	Otjiu-West (9)	Kunene	IRDNC	406	Yes	n.a.	X	X
CM	Puros (12)	Kunene	IRDNC	143	Yes	n.a.	X	X
DC	Kyaramacan (14)	Caprivi	IRDNC	603	Yes	1,641[(e)]	X	
DC	Dzoti (21)	Caprivi	IRDNC	131	Yes	1,298[(e)]	X	X
DC	Tjaka Ben Hur (63)	Omaheke	CRIAA SA-DC	143	Yes	473[(e)]	X	
DC	George Mukoya (77)	Kavango	NNF	207	Yes	164[(e)]	X	X
M	Shifula (48)	Oshana	CRIAA SA-DC	45	No	14,788	X	
M	Nkugoyepongo (52)	Oshana	CRIAA SA-DC	45	No	7,906	X	X
M	Diinina (33)	Ohangwena	CRIAA SA-DC	122	No	10,976	X	
M	Kuupenda (58)	Oshikoto	CRIAA SA-DC	164	No	11,155	X	X
M	Tunetu (39)	Omusati	CRIAA SA-DC	72	No	8,775	X	X

(a) X=Ximenia, CM=Commiphora, DC=Devil's Claw, M=Marula
(b) From NRI list of PPO members trained as of December 2012.
(c) MCA-N Primary Production Improvement Grant
(d) Average of average household income and average household expenditure according to the INP Household Baseline Survey, where available
(e) Average female-harvester income in one season of 2012 (NRI Quarterly Report)

Key Informant Interviews. A total of 19 INP KIIs were conducted, 12 during the midline round and 7 during the endline round. Table 41 below gives the breakdown by type of respondent.

Table 41. INP KII respondents

Key Informant Category	Number of KIIs Midline	Number of KIIs Endline
Public Sector	1	1
MCA-N (INP Activity Staff)	1	1
Implementing Partner	4	5
Private Sector	6	0
Total	**12**	**7**

Household Survey. For the INP activity, the sample is comprised of households selected from 2009 PPO membership lists using a stratified single-stage sample design, stratified by INP species. It is important to note that while NRI worked with more than 60 PPOs, NORC was only able to obtain membership lists for a subset of those. Therefore, the original sampling frame is not representative of the entire PPO population. At baseline, the final sample consisted of 296 interviews out of a target of 500 interviews. Several issues encountered during baseline data collection made it impossible to reach the target of 500[51]. As a result, in addition to the 296 households from the baseline survey, the endline INP HH survey also includes an additional 204 INP households in order to reach the original target of 500 households and to provide additional data points for the endline analysis. These additional households were sampled from the original baseline sample frame in order to maximize comparability.[52] It is important to note the following points concerning this additional sample:

(1) Of the 28 PPOs represented in the baseline sampling frame, 18 PPOs are represented in the final baseline dataset (for the reasons mentioned above). Because we do not have baseline information for the PPOs which were not surveyed at baseline, including them at endline was deemed not useful for the CS/INP evaluation given that a pre-post analysis would not be possible. Therefore, the additional 204 endline households were drawn from the 18 PPOs represented at baseline only.[53]

(2) However, the 18 PPOs represented in the baseline dataset do not cover Commiphora. Given that Commiphora is one of the main INPs targeted by the intervention, the final endline sample also includes Commiphora PPOs (in addition to the 18 PPOs included at baseline).

[51] Reasons are: (1) the sample frame was compiled from membership lists dating back to 2009 while baseline data collection was conducted in 2011, so maybe members on the list were no longer involved in INP related income generating activities, (2) harvesters in Zambezi and Otjozondjupa were at mobile bush camps, making them unlocatable. For more details, see the Baseline Field Survey Report.

[52] For statistical rigor, the addition of new households for the endline cross-section should come from as similar a sampling frame (and sampling method) as the original baseline sample. Additions should also aim to achieve the original sampling design targets for each INP.

[53] The qualitative data collection on the other hand does include PPOs which were not included in the baseline data collection.

While a pre-post analysis will not be possible for these harvesters, the data from these harvesters can be used to generate descriptive statistics about the endline period.

In the end, the dataset includes a total of 244 panel households (households that were interviewed at both baseline and endline) that are used for the before-and-after quantitative analysis

Implementer Database/Monitoring data (CDSS/NACSO data). In addition to primary data collected by NORC, the evaluation team also made use of data from the implementing entities. Below is a list of data items and their date of availability:

Data Item	Data source	Date of availability
Number of technical support (TS), management support (TR), or both TR/TS trainings for: Theme 1, Theme 2, Theme 3, Theme 4, Theme 5, Theme 6, Theme 7, Theme 8, Theme 9, Theme 10, Theme 11	MCA-N Quarterly Progress Report 4-14 NRI Training Database	2010-2014
PPIG values **PPIG year**	MCA-N Quarterly Progress Report 4-14	2010-2014
Support Needs (Resource Management, Institutional Capacity, Market Linkages) from the PPO Diagnostic Report	PPO Diagnostic Reports Part 1-2	2010

Monitoring data is available for all PPOs, which includes information about different types of trainings (technical support and management support) that were provided across 11 distinct themes including Organizational Development, Business and Marketing Skills, INP Management, and Sustainable Resource Utilization. Training data is available in each quarter from the end of 2010 until Q1 2014 through MCA-N's Quarterly Progress Reports 4-14, as well as the NRI Training database. Also available is information about which PPOs have received Primary Production Improvement Grants (PPIGs), and which year these awards were disbursed. Finally, the PPO Diagnostic Report provides information regarding perceived support needs within each PPO, gathered through a 2010 survey provided to all PPOs.

4. Analysis and Findings

As indicated above, the evaluation assesses the links between the different stages of the program logic. We start with the findings related to harvesting and processing techniques at the harvester level, before describing the findings at the PPO level and finally more broadly at the INP sector level, including the effects of activities aimed at marketing and sustainability of the INP sector.

4.1 Research Question: What is the uptake rate and effect of the practices and techniques introduced as part of the technical assistance on recipient harvesters? (RQ3)

- Quantitative data indicate that 100% of households said they applied what they learned in trainings
- Qualitative data confirmed that trainings were well-received and perceived as useful, as harvesters applied what they learned although some trainings may have been more difficult to implement than others
- Harvesters indicate that first effect of trainings was to open up their eyes as to the potential of INP to contribute to their income
- Qualitative data also indicate that harvesters think trainings have contributed to the use of sustainable harvesting practices (especially for Devil's Claw and Commiphora) and to increase the quality of INPs

Qualitative Findings

The MCA Namibia INP activity introduced INP and PPO related practices and techniques (such as INP harvesting techniques, PPO management, financial and business planning) via two distinct channels: (1) through trainings and (2) through in-field technical assistance. According to an Implementing Partner (key informant, the in-field technical assistance has been more effective than the trainings in terms of impact on harvesting practices as field staff respond to questions from harvesters on an as-needed basis. Technical assistance is therefore more targeted and focused on the specific needs of individual harvesters. Technical assistance can also be given multiple times and reinforces what has been learned in trainings. Acccording to key informants, the more technical assistance, the greater the impact as harvesters directly apply what they are learning with direct oversight and input from implementers. However, technical assistance is more difficult to monitor; although field staff are supposed to document the provision of technical assistance, in practice it is difficult to keep track of all the trips made and phone calls received.

> *"We have learned that for us to sustain ourselves we need to depend on our nature, from natural products and the animals. [The training] taught us about many products even some that are not gathered." […] "It helped increase the number of [harvesters] gathering."*
> - Otjiu-West PPO, Commiphora harvesters

In most PPOs, attending the trainings was a prerequisite for being able to harvest, and as of February 2014 more than 8,000 harvesters across all PPOs had been trained. Trainings can be classified into two

main categories: (1) trainings targeted at harvesters; these concern harvesting and processing practices, and (2) trainings targeted at the management of PPOs; these concern PPO management, bookkeeping, business planning etc. In contrast to what the IP key informant mentioned above communicated, FGDs indicate overwhelmingly that harvesters found the trainings beneficial, they seemed eager to participate and to learn and apply their newly gained knowledge in order to increase their economic well-being. Indeed, across all FGDs, all harvesters indicated that their main motivation for starting to harvest was to lift themselves out of poverty.

Effects of harvester trainings: quality, quantity, sustainable harvesting practices

FGDs strongly indicate that trainings targeted at harvesters have had an effect. The first immediate effect of the trainings is that it opened harvesters' eyes to the potential of INPs to increase their income. For Commiphora and Devil's Claw, this led to an increase in the number of harvesters.

"We just had no idea that we could live on these trees, they were just producing without anyone gathering." [Puros PPO, Commiphora harvester]

"At first, people were harvesting for self-consumption, but after the training, people came to know that it can also be sold, then they started harvesting and they even go to different areas in search for it, and as a result, they harvest a lot of it." [Mukoya PPO, Devil's Claw management]

Furthermore, in all FGDs, harvesters mention that they apply the techniques that they learned through training. The assimilation of techniques and practices is evidenced by all the descriptions given by harvesters of the various techniques that they have learned in training. For instance, harvesters describe the following practices:

- Commiphora Resin harvesters:
  - Harvesting without cutting down the tree
  - Harvesting in multiple areas
  - Keeping different INPs in separate bags
  - Cleaning the INP so it is free of grass, stones and sand
- Devil's Claw harvesters:
  - Digging only one side of the tuber and closing the hole; not pulling the taproot which would cause the plant too die
  - Cleaning the INP before slicing it
  - Drying the INP on clean nets instead of on the ground
- Marula:
  - Not harvesting dried up Marula which is rotten
  - Washing their hands and covering their heads before harvesting the INP
  - Using clean containers for storing Marula and storing it in a separate room, away from animals
  - Cleaning the Marula of all sand before crushing it

- Removing all the fruit pieces around the kernels using small tools rather than their hands, such that kernels are completely clean
- Washing the kernels free of juice before drying them
- Drying the kernels on clean nets instead of on the ground
- Not leaving the Marula outside under the rain
- Preventing the government from spraying DDT on the Marula (thanks to pictorial signs provided by CRIAA)

- Ximenia harvesters
  - Cleaning the INP before bringing it to the PPO

In a few cases, some trainings may be more difficult to implement than others. For instance, for Devil's Claw, some harvesters did find it difficult to cover the trenches after digging, especially when they couldn't harvest anything from the plant. The George Mukoya FGD participants also mentioned that the gender training was not completely implemented as it was difficult to get women involved in all activities of the conservancy (the George Mukoya PPO is managed by the conservancy).

However, in all FGDs, participants generally communicated that they use all of the trainings. All FGDs also suggest that these harvesting and processing practices have had an effect on the quality of the INP. For all 4 INPs, FGD participants mentioned that the harvest is now cleaner and of higher quality than prior to trainings:

"Because of a lack of knowledge people thought they could cheat by mixing different Commiphoras for the sake of quantity but [in Puros] we just gather specific Commiphora" [Puros PPO, Commiphora harvester]

"I now sell clean INPs. It has increased the quality and quantity of the products that I sell. In the past, we used to sell Commiphora and other INPs that still had sticks and stones and this can break the processing machine. But now the machine does not break anymore because the Commiphora is clean." [Puros PPO, Commiphora harvester]

"The training which helped us improve our harvesting is the one which was on maintaining the quality of Ximenia […] it taught us everything we must do in order to have good quality products. Now all of our members harvest products with similar and good quality." [Eenhana PPO, Ximenia management]

The effect on quantity is a bit less clear from the FGDs. For Marula, the trainings did not seem to affect quantity:

"There is more increase on the quality than on harvesting because even though I am trained, the training will not increase the amount of my harvesting more than the quality because I might meet obstacles that might prevent me from harvesting more. But even if my harvest is not big and the quality is good then I am still good." [Nkugoyepongo PPO, Marula harvester]

For Commiphora, one harvester indicated that the trainings taught them to harvest in new areas which led to bigger harvest:

"At first one of the shortcomings was that when going to gather, [they] went to one direction and gathered just a few […] but when we started changing directions we gathered more." [Puros PPO, Commiphora harvester]

For Devil's Claw harvesters, the size of their harvest may also have been affected by trainings. The trainings taught harvesters to dig one side and to leave the other side and to close the hole after digging the tuber without pulling out the taproot to allow the tuber to grow bigger at the next harvest. The harvest is strictly controlled by resource monitors and controls have been put in place to protect Devil's Claw from wildfires. According to key informants, harvesters who applied sustainable harvesting techniques as a result of the trainings observed immediate effects and recognized the importance of these techniques in order to ensure the sustainability of their resource base.

The trainings also seem to have had an effect on the sustainable harvesting practices of Commiphora. When asked what the most important training was, one harvester from Puros mentioned that it was *"learning that [they] should not cut the trees but that [they] should rather just harvest the Commiphora with [their] hands"* so that there can be more trees for the next harvest. Similarly, a harvester from Otju-West mentioned that some people used to burn the bushes but that they no longer do it and another said that the most helpful training was the one on environmental monitoring which taught them to not harvest in only one area.

> *The PPO people now are the ones who know where all trees are. They even report to us if they notice that trees are being damaged in some areas. They are really watching over the natural resources so we see that the trainings have brought conservation to the nature by the PPO members.*
> - Otjiu-West PPO, Commiphora

FGDs indicate that there is a strong link between quality and sales, hence a strong motivator for harvesters to apply the practices learned and to protect the resource base to ensure the sustainability of their source of income. According to the FGDs, this seems to be particularly the case for Devil's Claw, Marula and Commiphora.

"Before, the Marula kernels use to come back from the factory because they were not hygienic but because of the trainings we don't get the Marula kernels back anymore" […] "when your Marula has been sent back to you, you know it is because there are some wrong things. So you would also need to just check through to see if you can find what is wrong. And then extract your own edible oil from it. And you know that you will never repeat it again. You will really feel sad, because you won't receive any money." […] "And you feel bad when others receive their money. And you just say oh my lord, nothing is coming into my pocket." [Nkugoyepongo PPO, Marula management]

There is a clear sense that hygiene and avoiding contamination are crucial to securing Marula buyers. For instance, DDT is frequently mentioned as a possible threat to hygiene as it is being sprayed around the households and contaminating vessels which may be used to store the INP. One harvester stated *"the buyers are helping us but they don't have that [DDT] in their countries, that is why it is very dangerous if they find the poison in our kernels because they can stop being our customer."* The project helped reduce this risk by providing harvesters with new buckets as well as by building a few new sheds for storage.

Management-level trainings and technical assistance

While key informants acknowledged the importance of trainings on business management and budgeting, the impacts are not as strong as those of the harvester-level trainings given the level of complexity of these topics. Two key informants indicated that the level of these trainings was too high for the skills level of the participants, especially those with low literacy and numeracy skills, and that these trainings should have started at a lower level. One key informant indicated that there has been a noticeable increase in record keeping and budgeting skills but that a lot of work still remains to be done, especially around budgeting. The FGDs also suggested that bookkeeping training had an effect on PPOs.

"Now we don't take long to calculate our books even if we decide that today we are going to close our book, we are going to calculate it properly until the last cent. This has really changed but before a week could pass without us knowing how to finalize the books." [Kuupenda management, Marula]

On the other hand, it seemed that bookkeeping training did not have such a positive effect for Nkugoye-pongo as management members indicated that bookkeeping training was more difficult to implement. As this harvester put it *"we are struggling to calculate the bank books, maybe we don't know math-ematics."*

In general, these trainings require extensive follow-up in the form of technical assistance. Some focus group participants from management staff of PPOs, however, did seem to think that the trainings helped in terms of management.

"Through the trainings, the [service provider] helps us to run our businesses effectively; the training given is on management, sales, gathering, saving and creating job opportunities". [Puros Management, Commiphora]

Furthermore, participants from Puros also indicate that there has been a change in terms of the sales process. The PPO can only accept a pre-determined amount of INP. However, prior to trainings, this target amount would be attained quickly with the products provided by the first harvesters who reached the weighing point. Harvesters who arrived too late would be sent back home with their entire harvests and no income. Now, each harvester can only sell a portion of their harvest, meaning that all harvesters get to receive a small amount of money so the distribution of income is much more equitable. The presence of a scale is also synonymous with a more transparent process; harvesters are able to better understand why they are getting a certain amount of money. This has led to a decrease in cheating and

corruption. The management staff of Otju-West also indicated that the trainings were helpful. One respondent was trained to train harvesters. They understood that members first had to be registered to be a member of the PPO and that harvesters must know the rules of gathering. Another management member also added that conflicts between harvesters have decreased and harvesters understand that they cannot do as they wish regarding the gathering of Commiphora. The management is also responsible for making sure that people from other conservancies do not gather in their conservancy.

Participants from the Dzoti management staff also indicate that all aspects of management have improved since getting the training. According to another harvester, the biggest impact of the trainings was *"to bring people together, organize them and to start a conservancy and in the process get a PPO which harvests INPs from which we get money."* In fact another management member indicated that they now accompany harvesters to ensure that they harvest Devil's Claw properly instead of letting them go on their own and resource monitors control unlawful harvest and practices such that the resource base is better protected. Non-management harvesters also indicate that the group is well managed and that the PPO management communicates well with harvesters. For instance, new prices are passed on to harvesters on time.

FGD participants from Eenhana, the one Ximenia PPO in the sample, believe that the trainings have helped the PPO in numerous ways: communication with members, bookkeeping, planning and assistance in securing other types of assistance. The trainings have helped improve communication between the PPO and harvesters.

> *[Before the trainings], we did not really communicate well with our members. Even when the chairperson wanted to communicate with the members, they did not use cell phone services but they would just use the radio. But CRIAA told us that it is best to use cell phones to avoid cumbersome ways of communication.*
>
> - Eenhana Management, Ximenia

According to management members, CRIAA also helped with long-term planning:

"We did not plan how much money we would want to earn in the following year, it was only because of CRIAA that we started doing this. After receiving training, we started planning, saying next year we must target to have a certain amount of money left". [Eenhana Management, Ximenia]

CRIAA also taught management that the chairperson's phone number should be linked with the bank account so that when money is transferred, a notification is sent to the phone. Another important form of assistance from CRIAA is the nut cracking machine which was not yet used at the time of FGD but held promise for improving the amount of effort needed to crack Ximenia nuts.

Other effects of trainings

Most key informants indicated that gender focused trainings did not work as envisioned. One IP key informant who focused on Ximenia indicated that approximately 97% of harvesters are women, so the purpose of implementing a gender policy in this project was unclear, resulting in few gender trainings carried out in Ximenia areas. Most key informants agreed that gender trainings were not as effective as

other types of trainings such as the ones on harvesting techniques. According to two key informants, the gender trainings were in fact used to discuss issues related to child labor, especially for Devil's Claw harvesting. After these trainings, PPOs signed a form promising that children would not be used for the harvesting of Devil's Claw.

However, one informant indicated that they did allow people to think about the distribution of responsibilities between household members and responses from FGDs generally point towards an improvement of gender relationships.

"For me to open my voice it is because of the trainings sponsored by the [IRDNC] institution; the ones that say when it comes to poverty men and women have the same power so decision making should be equal." [Puros harvester, Commiphora]

The Marula trainings also had an unintended effect on the cleanliness of the households in their own homes which several harvesters across two FGDs mentioned. They indicated that they applied cleanliness practices to their own food. As one harvester put it, *"we, the Owambo people used to just throw our rubbish close to our houses, but now if you pass by our houses you will see that there is no more rubbish near most of the houses. There is a difference now in our lives, we have incorporated the cleanliness that we have learnt from the training."*

Finally, another unintended benefit of the trainings and technical assistance that was mentioned by practically all key informants concerns the sense of pride felt by harvesters in knowing correct techniques and the sense of empowerment and ownership in managing their natural resources. One IP key informant also mentioned that harvesters travelled throughout the region to take part in trainings and benefitted in increased exposure to new ideas and people.

Quantitative Findings

While the qualitative analysis shows that harvesters who attended the trainings found them useful, the quantitative data from the household survey show that not all harvesters sampled participated in the trainings. Participation in training was voluntary, except for Devil's Claw which require harvesters to be trained in sustainable harvesting practices before being able to register as a harvester. Furthermore, the sample of harvesters was drawn from a sample frame compiled from 2009 PPO membership lists rather than from a list of trained harvesters. Between the baseline data collection in 2011 and the endline data collection in 2014, more harvesters reported having attended a training in the past 12 months prior to the survey but not all harvesters. These differences in training attendance allow us to compare harvesters who attended trainings to harvesters who did not in order to assess the impact of the trainings on outcomes of interest. However, harvesters who attended the trainings may be different from harvesters who did not attend the trainings in important ways, such as socio-demographic characteristics, prior knowledge of harvesting practices and motivation. It is therefore important to understand in what ways, if any, these harvesters may differ, so that these differences may be controlled for in the analysis in order to ensure that any impact detected is a result of the trainings and not of these har-

vester characteristics. Therefore, in this section, we analyze treatment uptake, i.e. participation in training sessions.

For analysis purposes, we bundle the different types of training in two broad categories: Management and Non-management. Management encompasses Organizational development, Business and marketing skills, Leadership, Administrative skills and Business plans; Non-management includes Sustainable resource utilization, INP management and quality, and Processing of INPs. In what follows, we focus on Non-management training as this type of training has the greatest potential of affecting harvesting.

Table 40 displays a tabulation of the number of Non-management trainings each panel household received at baseline and endline. We can see that at baseline only 29 households participated in training (12%), while participation was much higher at endline. It is worth clarifying that training at baseline and endline was recorded in the surveys if training occurred in the last twelve months before data collection, so training taken in 2012, for instance, was not recorded.

Table 42. Training uptake[54]

Number of trainings	Baseline (# of households)	Endline (# of households)
0	215	101
1	29	99
2	0	42
3	0	2

Source: NORC INP Household Surveys, 2011 and 2014.

Although these figures provide an idea of the extent to which household members attended training (at baseline and endline), it is important also to have a sense of whether the lessons learned over these sessions were applied in the harvesting processes. In effect, practically all trained households reported in the survey that they applied what they learned in the training sessions.

In Section 4.2, we analyze the determinants of treatment uptake, in other words the characteristics of harvesters that are associated with participation in trainings, in order to better understand what kind of harvesters chose to participate in trainings. This analysis allows us to better estimate the effects of the trainings on quality and quantity of harvest as explained in Section 4.2.

[54] Note that the INP harvester were sampled from a sampling frame consisting of 2009 PPO membership list and not from trainee list. Therefore not all of these harvesters have necessarily participated in the training. Furthermore, the question posed in the questionnaire asked for trainings taken in the last 12 months.

4.2 Research Question: Do the technical assistance package and the small grants increase the quantity and quality harvested and/or processed by recipients? (RQ1)

- The quantitative analysis finds a positive and significant effect of training on quantity harvested only for Marula
- Commiphora: harvesters from management and non-management FGD all communicated that trainings has affected quantity and quality of Cmmiphora harvest
- Devil's Claw: most FGDs (3 out of 4) mentioned that trainings have increased the quality of the harvest (bigger size tubers and cleaner processed products)
- Marula: all FGDs suggest that quality of Marula has improved due to trainings as they have affected practices at all stages of harvest and post-harvest, especially in terms of cleanliness
- Ximenia: the INP was negatively impacted by climatic conditions the first two years of the project making it difficult to grow the sector but there is a sense that Ximenia quality did increase (due to better decortication techniques especially)

Qualitative Findings

Overall, several key informants mentioned that prior to the start of Compact, the INP sector was more disorganized and INPs were of lower quality. In particular, awareness of sustainable harvesting techniques, decortication techniques and of the quality standards expected by buyers was low. Furthermore, multiple NGOs were working in the sector but not collaborating, according to a key informant, each focused on their own fiefdoms. According to these two key informants, MCA-N was able to bring stakeholders together in order to define the scope of the MCA-N INP intervention and to take a focused and holistic approach to the INP system. The quality of INPs increased drastically as a result. FGDs indicate that harvesters are now more aware of the quality standards expected by buyers, especially as low quality harvests can be sent back to harvesters.

Commiphora

Harvesters from management and non-management from all focus groups communicated that the quantity and quality of Commiphora harvest has been affected by the trainings. In terms of quantity, harvesters mentioned that trainings opened their eyes to the resources naturally occurring in their immediate environment. Furthermore, the trainings also taught harvesters where to look for Commiphora and focused on sustainable harvesting techniques. The focus groups also suggest that training had an effect on quality. This is reflected in several ways. First, harvesters seem to better understand that there are different types of Commiphora and that they cannot be mixed. They also seem to understand that buyers value Commiphora of a certain color; the reddish Commiphora is of good quality and is also older. When asked which trainings were the most useful, several harvesters mentioned that it was learning to keep INPs in separate bags. Second, harvesters from both Puros and Otju-West mentioned that they now sell clean Commiphora which is free of grass, stones and sand. Nevertheless, it seemed

that some harvesters had some difficulty describing if their harvest is of high quality. When asked if the trainings helped increase the quality of their harvest, several harvesters responded by saying that their Commiphora is now being used for soaps, lotion, lip glosses and other products. They equate Commiphora being used for cosmetics with high quality harvest.

In terms of processing, through the support of MCA-N, the distillation facility for essential oils is now functional and the facility operational. Special emphasis has been put on the creation of a Trust that owns and operates the facility. The Trust is an amalgamation of several PPOs/conservancies in the Kunene region that can make use of established regulations and methodologies to produce oils that conform to standards of quality. Still, the production is at a low level and the current output is primarily marketed in Namibia and South Africa.

Devil's Claw

According to a key informant, there were only 9 or 10 Devil's Claw PPOs working before the intervention. This has now increased to approximately 24 PPOs. Even assuming attrition after the compact ends, there is still a significant increase in the number of harvesters involved in the sector. One FGD also echoed this statement and participants from the Mukoya FGD indicated that the training raised people's awareness of the value of Devil's Claw such that people started harvesting. Furthermore, in 3 out of 4 FGDs, participants mentioned that the trainings have increased the quality of the harvest as indicated by (1) bigger size tubers and (2) cleaner processed products. The size of the tubers is a direct result of sustainable harvesting practices. The trainings have taught harvesters to dig one side and to leave the other side, to close the hole after digging out the tuber and not to pull out the taproot which would cause the plant to die; this allows the tuber to grow bigger at the next harvest as it is easier for it to grow in that type of soil. Harvesters also understand that too many plants in one area prevents them from growing bigger in size.

Bigger tubers also means increased volume and weight. As one harvester put it, *"the size increased [such that] bigger fruits, just two of them can fill up a small bag."* In terms of cleanliness, participants indicated that the trainings taught them to properly process the Devil's Claw. Prior to the trainings, harvesters would regularly find rotten tubers with good tubers and harvested products included unwanted roots. Now, the products are cleaned from these unwanted roots, cleaned before getting sliced and spread to dry on nets as opposed to directly on the ground. The harvesters indicate that a big motivation for ensuring that their Devil's Claw is of high quality comes from knowing that their product is being used to make medicine. One harvester also indicated that higher quality Devil's Claw leads to higher sales price. Finally, the harvest is strictly controlled by resource monitors and controls have been put in place to protect this resource from wild fires.

Private sector key informants and information obtained informally from European importers corroborate the findings from FGDs, as they indicate that the proportion of premium quality raw material appears to have increased significantly since the beginning of the project. According to several key informants, today more than 30% of the Namibian export is of premium quality. Major achievements are the

establishment of a traceability system in all involved PPOs which harvest Devil's Claw in Namibia and the drastic reduction of unwanted particles. The Namibian middlemen and exporters are now able to offer greater volumes of different quality grades of Devil's Claw to downstream operators. This point of view is confirmed by the focus groups with PPOs who take pride in the newly acquired ability to supply a quality product that is sustainably harvested (as discussed in the previous research question).

While the quality of the raw material has improved, the total volume has remained more or less constant since the project started. According to one of the key informants, the average export volume over the last four years is very much in line with the long-term average since 1997 when the demand for Devil's Claw gained momentum. It is important to note that the goal of the project was not to increase the total volumes of Devil's Claw exported from Namibia. Rather it was to expand and increase the volume of sustainably and better traded Devil's Claw.

Marula

Since the start of the intervention, the membership figure of EWC has doubled, thanks in part to Compact activities it seems, which led to an increase in quantity of Marula harvested over the life of the project, according to a key informant.

> *We used to let our Marula seeds in the sun for a long time without removing them or we let them get affected by the rain but now we are responsible* – EWC member

All FGDs suggest that the quality of the Marula has improved in several ways due to trainings. Practices implemented at all stages of harvest and processing seem to have been affected, from harvest itself to storing to crushing the Marula to kernel extraction and drying. Indeed, the majority of FGD participants indicated that they understood the need for cleanliness at all these stages. As such, they cover their heads and wash their hands prior to harvesting, they clean the Marula prior to crushing, and make sure that the kernels are devoid of any fruit pieces and juice before drying them. Furthermore, FGDs indicate that Marula is now stored in separate rooms, away from animals, and harvesters ensure that Marula kernels do not come into contact with DDT contaminated surface.

"You know we first collect the Marula and we store them. Then when you are going to crush them, you first clean them and remove all the sand and you start crushing"

"We are taught that when you remove Marula seeds from the peels, you must wash them because if you dry them with the Marula juice on them, then they will spoil the quality of your kernels".

"Before the kernels used to come out rotten from the Marula, they used to rot because we used to put the Marula on the floor, when they are rained on, they start to lose quality and they start to germinate".

"We used to let our Marula seeds in the sun for a long time without removing them or we let them get affected by the rain but now we are responsible"

"Like the way meme is sneezing, she got affected by the wind, that day she must just tell herself that today I am not cracking. They [CRIAA] are really fighting with hygiene and anything that have poisons must stay outside."

According to FGDs, prior to the trainings, Marula kernels used to be sent back from the factory because they were not hygienic but this no longer happens. The 2,000 EWC members are able to supply 24–30 tons per annum to the processing facility. The annual yield is subject to significant variations, although the idle resource capacity is still remarkable[55]. The implementing partners interviewed cited various natural sources of variance such as drought or insect infestation as explanations for yield insecurities. Despite ongoing internal managerial problems EWC was able to improve the quality of the oil to the satisfaction of international customers, primarily because the pesticide and oxidation problems were solved through the installation of adequate post-harvest processes. Furthermore EWC seems to have managed to slightly increase the extraction rate of Marula oil. The KIIs indicate that the processing process has been improved and that the yield is now higher than before the Compact, probably thanks to preheating of the kernels.

Another Marula processing start-up was Oontanga Oils, a small privately owned enterprise. No information was available on the amount of oil produced by Oontanga Oils before the project. However, according to private KIIs, it appears that Oontanga Oils' production of Marula oil had increased although no precise data was obtainable. Furthermore, it seems that their oils meet international standards and are being sold to Europe and USA in addition to the domestic market.

Overall, according to one key informant many questions around technology and the future potential of Marula have been addressed, but the reliability of supply and long term resource base sustainability may not have been addressed sufficiently. One key informant indicated that they expected a greater expansion of the Marula market which has been a little disappointing. This may be due to the unreliability of the supply due to climatic conditions.

Ximenia

For Ximenia, the Tulongeni Twahangana Cooperative (TTC) is the overarching institution managing the value chain in Namibia. One IP key informant stated that increased supply management skills was a clear benefit of the program. However, for the first two years of the MCA-N funded project, climatic conditions negatively impacted the harvest of Ximenia. Therefore it was difficult to grow the sector although some harvesters from Eenhana indicated that their harvest amounts have increased. As one

[55] Harvest yields are fluctuating but statements suggest that much material is left unused or spoilt.

harvester communicated *"when we started first I remember that we never really used to get much in a 1 kilogram sack [but] now it has changed."* In terms of Ximenia quality, according to several key informants, there is a sense that Ximenia quality did increase as the trainings improved decortication techniques to extract high quality seeds that allow for better oil extraction. Opinions from focus group participants from Eenhana also mirrored this sentiment. A management member from Eenhana mentioned that before, Eenhana management would be working long hours to clean the ximenia gathered from the harvesters but *"the training has eliminated the activity of cleaning the products daily, because the harvesters are trained and therefore bring quality products."*

Furthermore, it seems that due to the trainings provided and constant operational business support, producer groups are better organised and processing technology and extraction rate have improved. However, one key informant stated that the long term resource base sustainability and supply may not have been addressed sufficiently, as weather conditions impact Ximenia disproportionately. One recommendation mentioned by a key informant was that of setting up government owned farms for some INPs although he recognized that growth techniques are not similar to other cash crops.

In Summary

In summary, Marula is the only resource for which quantities harvested seem to have increased. For Devil's Claw, the quality of raw material has improved and although overall quantities harvested have not increased, quantities harvested *sustainably* have increased). Ximenia has not been harvested substantially since 2011 due to adverse climatic conditions, although the trainings seem to have led to an improvement in INP quality, processing and extraction rate. Commiphora resin harvesting is undertaken irregularly given the stockpile of raw material that had accumulated before the project although the trainings seemed to have an effect on quality as well.

Quantitative Findings

In this section we analyze the effect of treatment on quantities of sold INPs. While in principle we could expect a positive (or at least non-negative) relationship between training and sales, it is possible that training may be correlated with *lower* harvest (and sales), if we consider the possibility – as is the case for Devil's Claw – that training may also be about incorporating more sustainable harvesting methods, which could reduce the harvest in the short run.

Table 43 shows mean quantities of INP sold in kg. We use survey data on INP sales and external data on prices to impute sold quantities[56,57]. For all surveyed households, we can see that the quantity sold

[56] Although survey data was collected for quantities harvested, after examining the quality of this data and compare the mean values with other data sources, we came to the conclusion that data on quantities harvested was not very reliable. As a substitute, we imputed the quantities sold using survey data on INP sales and external data for INP prices.

increased for Devil's Claw between baseline and endline, was relatively stable for Marula and observed a pronounced decline for Ximenia. The fall for Ximenia is perhaps a consequence of the drought observed during the fruiting time.[58]

Table 43: Quantities of INP sold in last 12 months before data collection (kg)

	All households		Panel households	
	Baseline	Endline	Baseline	Endline
Devil's Claw	38.6	64.9	34.9	78.1
Marula	21.9	22.1	21.5	21.7
Ximenia	46.2	8.1	45.7	7.3
Commiphora	n.a.	20.4	n.a.	n.a.

Source: NORC INP Household Surveys, 2011 and 2014, and NRI documentation (see footnote 56)

Analytic approach

In terms of the evaluation of the program, the main challenge when estimating the impact of any intervention is to use a proper counterfactual. If we have a group of treated and a group of comparison subjects, and we can assume that treated subjects in the absence of treatment would have experienced the same outcomes as comparison subjects, then we can say that comparing these two groups identifies the impact of the program. On the other hand, if the control subjects are fundamentally different from the treated subjects, then the comparison is not *only* going to reflect the effect of the program, but also the fact that the two groups are different to begin with.

Training

This is especially problematic if we are trying to measure something like the effect of training. Households that participated in training are probably different in very important ways from households that did not participate. Indeed, the former can be more entrepreneurial or informed than the latter. If we compare households that participated in training with households that did not, the difference is going to capture not only the effect of treatment, but also the effect of other underlying differences between the two groups.

[57] Price data for INP pricing for 2011, which we used as baseline, was found in two NRI produced, MCA-N commissioned reports: the "PPO Diagnostic Reports Part 1 & 2" from September 2010, and the "PPO Profile Report" from February 2013. These reports contained systematic data for total harvest quantities in kgs and income to farmers by PPO, INP and year. Less systematic data was also collected for number of total harvesters. Average price per kg was calculated by dividing income to farmers by total harvest kgs. Data for INP pricing from 2013, which we used as endline, was found in NRI's Monitoring and Evaluation Indicator Reports from June 2013 and April 2014, which provided information about total harvest kgs, income to farmers, and more complete information about number of total harvesters. As before, average price per kg was calculated by dividing total income to harvesters by total number of harvest kgs by INP, PPO, and year. For the PPOs in the survey data for which we couldn't calculate prices using this data, we used (weighted) average prices for INP/year.

[58] See Final report Lipid Oils CRIAA.

To tackle this identification problem, we implement two complementary strategies. First, and most important, we include household fixed effects in the regressions. We can do this because we have both baseline and endline data. By including household fixed effects any characteristics that may confound the treatment effect are isolated (controlled), as long as the characteristics are time-invariant. Second, we also include in the regressions propensity scores for treatment participation at each round of data collection.

Mathematically, the regression we estimate is:

$$Q_{it} = \beta_0 p_{it} + \beta_1 S_i^0 + \beta_2 \vartheta_t S_i^1 + \boldsymbol{X_{it}'\delta} + \beta_3 \vartheta_t + \{\boldsymbol{R_{it}}\} + \{\boldsymbol{\theta_i}\} + \varepsilon_{it} \quad (1)$$

where Q_{it} is the amount of INP sold by household *i* in period *t*; p_{it} is the number of training sessions the household attended; S_i^0 and S_i^1 correspond to the propensity scores for baseline and endline, respectively, described in RQ3; $\boldsymbol{X_{it}'}$ is a vector of time-varying characteristics that include the number of hours spent harvesting INPs,[59] being registered in a conservancy, household size, and characteristics of the household head (age, gender, and education); ϑ_t is the round dummy (*t*=0 at baseline and *t*=1 at endline), $\{\boldsymbol{R_{it}}\}$ is a vector of interaction terms between region dummies and round, $\{\boldsymbol{\theta_i}\}$ is a vector of (absorbed) household fixed effects, ε_{it} is an error term and the β_js and $\boldsymbol{\delta}$ are parameters to be estimated. Note that the objective behind including region and round interaction terms is to try to capture any major contextual change at the region level that could affect the outcomes of interest.[60]

To include propensity scores for treatment participation, we first investigate the determinants of treatment uptake. In all our regressions we include only observations for which we have both baseline and endline information. Having baseline and endline data allows us to control for time-invariant characteristics at the household level.

Table 44 shows descriptive statistics for some basic sociodemographic information. The first two columns show results for all the households surveyed at baseline and endline. For most variables we have data for 296 households at baseline and 496 households at endline. The third and fourth columns show results only for observations that are both at baseline and endline, this is the panel sample, and is composed of 244 households. Although the baseline sample included 296 households in total, it was not possible to locate all of them during endline data collection, this is why the number of households in the panel is lower than the number of all households surveyed at baseline. It is also important to note that

[59] To get at the number of worked hours we use data collected in the survey on the number of hours worked per week (harvesting INPs), and multiply that by the number of weeks the harvest of each INP is supposed to last.

[60] Although for Ximenia this is basically the same as including just the round dummy as it is grown in only one region, for Devil's Claw and Marula including these terms is more important as those INP are grown in more than one region.

because no baseline households harvested Commiphora, there are no Commiphora households in the panel. As such, panel households harvested either Ximenia, Marula, or Devil's Claw.

Table 44. Sociodemographic descriptive statistics

	All households		Panel households	
	Baseline	Endline	Baseline	Endline
% of heads w/ secondary or higher education	23.1	14.3	21.9	16.1
% of households heads that are female	47.9	55.2	47.2	48.9
Mean age of household head	59.6	60.5	60.6	65.1
Size of household	6.7	6.9	7.0	7.6
N	296	496	244	244

Source: NORC INP Household Surveys, 2011 and 2014.

In the first row we can see the share of households where the head has secondary or higher education. It is a little surprising that this percentage falls between baseline and endline, even when we look at the panel sample. This is due to some item-specific missing data at baseline that is inflating the share of household heads with secondary or higher education (at baseline).[61] Given these considerations, we can say that that approximately 15% of the sampled household heads have secondary education or higher.

In the second row percentages of households headed by a female are displayed. For all households, between baseline and endline this fraction increases by 7.3 percentage points, which suggests that the new households that refreshed the endline sample are predominantly headed by females. Not surprisingly, the fraction of household headed by females doesn't change that much between baseline and endline for panel households.

In the third row we can see the average age of household heads. If the household heads did not change between baseline and endline, for each household we should observe an increase of roughly 3 to 4 years. That age of the household head remains practically the same between baseline and endline when we look at all surveyed household suggests that the new households that refreshed the sample at endline are headed by younger individuals than the households surveyed at baseline. Also, for the panel households we observe an increase between baseline and endline of 4.5 years on average, which is slightly higher than the anticipated. This is perhaps due to changes in the actual individual heading some households, which could explain also that the fraction of households headed by females is not exactly the same between baseline and endline (in the panel sample).

[61] In fact, if the sample at endline is restricted to the households for which education of the household head is not missing at baseline, the share of household heads with secondary or higher education is roughly the same at endline and baseline.

In the fourth row we can see the average household size, which increases a little over time, but more for panel households than for all the surveyed households. Finally, the fractions of households registered in a conservancy are displayed in the fifth row.

Determinants of Training uptake

We analyze treatment uptake using two different models. First, we study the determinants of having participated in at least one training (see Section 4.1 for more information on training uptake). Second, we also present results for the determinants of the *number* of trainings each household took (i.e. treatment dosage).

We model the training uptake decision as the probability of participation. This probability is in turn modeled as a propensity score within a probit model. Mathematically, we estimate the probability of participation *R* as $\Pr(R = 1) = \Phi[\boldsymbol{\beta X_{i,t}}]$, where Φ stands for the normal distribution, $\boldsymbol{X_{i,t}}$ is a vector of household characteristics at baseline and $\boldsymbol{\beta}$ are parameters to be estimated. Similarly, to model treatment dosage $T_{i,t}$ we define as the predicted value of $\hat{T}_{i,t}$ in $\Pr(T_{i,t} = N_{i,t}) = \mathcal{P}[\boldsymbol{\gamma X_{i,t}}]$, where $\mathcal{P}$ stands for the Poisson distribution and *N*ϵ{0,1,2,3,…}.[62]

In Table 45 we can see the results for each round of data collection and for each type of model. In columns 1 and 2 the regression results for the participation rate (proportion of households participating in trainings) are displayed for baseline and endline, respectively. While the participation rate at baseline was 14.3%, the figure at endline was 58.3%.[63] This may be driven simply by the fact that only 4 of the 17 PPOs in the panel had received training at baseline, while all of them had by endline. Also, we can see that Gender, Age and Type of INP are correlated with participation at baseline. More specifically, households headed by a female were less likely to participate in training, while Age is also negatively correlated with uptake. Regarding type of INP, both Marula and Ximenia have a negative coefficient, although it is only significant for Ximenia. At endline, there is a positive correlation between education and training. A positive effect is also observed at endline for the number of training sessions taken at baseline. With respect to type of INP, at endline the coefficients are positive for Marula and Ximenia, but only the former is significant.

[62] The Poisson model is widely used to study count variables, such as the number of trainings a household attends.

[63] The participation rates do not exactly coincide with the ones that can be calculated from **Table** 42 because the participation rates in **Table** 42 are weighted and in **Table** 45 they are not.

Table 45: Determinants of household training uptake at baseline and endline

	At least 1 training		Number of trainings	
	(1)	(2)	(3)	(4)
	Baseline	Endline	Baseline	Endline
Household head characteristics				
Secondary or more education	-0.673	0.774**	-1.019	0.289*
	(0.487)	(0.270)	(0.656)	(0.143)
Female	-0.658**	-0.166	-0.765*	-0.0776
	(0.248)	(0.194)	(0.357)	(0.128)
Age	-0.0302**	0.00422	-0.0383**	-0.00308
	(0.0107)	(0.00722)	(0.0143)	(0.00458)
Household size	-0.00582	0.00725	-0.00145	0.0418
	(0.0469)	(0.0310)	(0.0709)	(0.0219)
Previous training		1.086***		1.091***
		(0.316)		(0.101)
INP (Devil's claw excluded)				
Marula	-0.414	0.681*	-0.572	0.453**
	(0.349)	(0.313)	(0.535)	(0.166)
Ximenia	-1.038*	0.560	-1.699*	0.512*
	(0.450)	(0.333)	(0.822)	(0.200)
N	244	244	244	244
Mean dep. Var.	0.143	0.583	0.143	0.890

Source: Own calculations using NORC INP Household Surveys, 2011 and 2013.
Notes: All specifications include dummies for missing age and education of the household head.
Standard errors in parentheses. * p<0.05 ** p<0.01 *** p<0.001

In columns 3 and 4 the results for the Poisson regressions are shown. Not surprisingly, the sign and significance level of the coefficients are very similar to those obtained from the probit analysis. Households headed by a female are less likely to have participated in training at baseline but that relationship disappears at endline; and a similar pattern is observed for Age, as the coefficient is negative and significant at baseline, but very small and not significant at endline. Education and previous training are positively correlated with training at endline, and the coefficients for Marula and Ximenia are negative at baseline and positive at endline, although not all of them are significant.

These results provide a few interesting insights regarding the data generating process. First, while households headed by females may have had a lower participation in training at baseline, this was not the case at endline. This is possibly a consequence of gender outreach activities, or maybe because females were discouraged from participating in (or more averse to) training, but with time learned its importance. The bottom line is that there does not appear to be a gender bias in training uptake at endline. A similar story can be inferred for households headed by old individuals, as age was negatively correlated at baseline but such relationship disappears at endline.

Second, households headed by people with more education are more likely to participate in training. While this is to be expected – more educated people are probably better able to value the importance of training (and/or profit from it) – it does raise two different concerns. First, the fact that training is correlated with education suggests that there may be other characteristics also correlated with training, like motivation or entrepreneurship, which cannot be observed but positively affect the outcomes of interest (income, harvested quantity). The fact that we cannot control for these unobservable constitutes a misspecification that could confound our estimates of the effects we are trying to measure and, therefore, pose a challenge for identification of the causal effect of training. We will come back to this problem in the following sections.

This finding also carries implications for the effect of the INP program on inequality of access to training. Hence, from the perspective of equality if people with more education are more likely to participate in training (and benefit more from it), future programs should try to increase participation of the less educated.

Finally, the results showed that harvesting both Marula and Ximenia were negatively correlated with training at baseline, but that pattern reversed at endline (although not all the coefficients were significant). It is important to note that the difference in timing of training uptake across Devils's Claw and Marula/Ximenia harvesters could be explained also by how training for the different INPs was provided over the years.

PPIGs

Although the main effect we are trying to analyze is that of training, the analysis also incorporates the effect of PPIG. A few considerations are worth highlighting. First, PPIGs were not given randomly, but PPOs had to apply for them[64]. This creates an identification problem similar to the one described before for household attending training because PPOs applying for a PPIG may be fundamentally different from PPOs that did not apply. Including the value of the PPIG as a covariate will capture not only the causal effect of having a PPIG but also that the PPOs requesting the grants were probably very different in observable and unobservable ways from those that did not request the monies. Given that we are already controlling for household fixed effects, we can claim that we are already controlling anything that is time-invariant. In addition, and in the same spirit as the propensity scores in the attribution equations, we model PPIG uptake at the PPO level and also include the expected value of PPIG as a control in the regressions.

Finally, apart from the difficulties of estimating the impact of PPIGs in general, when we analyze the case of Marula and Ximenia things get more problematic. The problem with Marula is that PPOs repre-

[64] A total of 8 rounds of PPIG awards resulted in 56 PPIGs were given by the end of the INP Activity. The value of PPIG grants awarded was approximately US$318,302. Source: INP Quarterly report 14.

sented in the survey panel data have not received any PPIG money, so in this case there is no activity to be evaluated. In the case of Ximenia only one PPO in the panel received PPIG funding so there is no cross-sectional variation for Ximenia. Hence, the effect of receiving a PPIG cannot be distinguished from the effect (captured by the round dummy) of any other change over time that affects all Ximenia harvesters.

For these reasons, only Devil's Claw regressions consider PPIG explicitly. More specifically, for Devil's Claw we estimate a modified version of equation 1:

$$Q_{it} = \beta_0 p_{it} + \beta_1 S_i^0 + \beta_2 \vartheta_t S_i^1 + \boldsymbol{X_{it}'\delta} + \beta_3 \vartheta_t + \{\boldsymbol{R_{it}}\} + \{\boldsymbol{\theta_i}\} + \beta_4 P_{it} + \beta_5 \hat{P}_{it} + \varepsilon_{it} \qquad (2)$$

where P_{it} is the average amount of funding received by the corresponding PPO,[65] $\hat{P}_{it}$ is the expectation (prediction) of P_{it} conditioned on observable characteristics at the PPO level (i.e., average education and age of the household head, proportion of households headed by females, average household size, and the year the PPO was founded), and the rest of the terms are the same as in equation 1.

Findings

Before analysing the effect of treatment on sold quantities, we present results for hours harvesting INPs. The amount of time a household spends harvesting an INP should be correlated with the amount harvested (and sold), but the latter may itself be affected by treatment. Hence, it is important to know whether there is any correlation between training and hours harvesting because, if there is, then including hours as a control in the harvest model could lead us to underestimate the effect of treatment, since part of it could be captured by the hours variable.

Table 46 shows the regression results for hours harvesting INPs. Given that the most saturated specifications include variables estimated in previous regressions (the propensity scores), we realize that, ideally, the standard errors should be bootstrapped; however, given the small samples for Devil's Claw and Ximenia, we decided to present standard errors clustered at the household level for these INPs, and only for Marula the standard errors are bootstrapped. It is worth noting that the differences between the two approaches were very small.

The model is the same as the one described in equation (1), except that the covariate hours harvesting INP replaces the dependent variable, quantity harvested. The first column contains the regression for hours harvesting Devil's Claw without the propensity scores. Although the coefficient on training is positive, the standard error is quite large and the parameter is not significant. In the second column we include the propensity scores for treatment uptake at baseline and endline, but the relationship

[65] More specifically, this average was calculated as the sum of PPIG in NAD of 2009 received since 2011, divided by the weighted sum of households affiliated to each PPO.

between training and hours harvesting does not change much. A similar story holds for Marula (columns 3 and 4); as the coefficients on training with and without propensity scores are small and not significant. For Ximenia we don't find significant effects either.

In sum, we can say that treatment does not seem to have affected hours harvesting.

Table 46: The effect of training on hours harvesting, by INP

	Devil's Claw		Marula		Ximenia	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-management training	41.74	159.7	10.18	-5.299	68.50	76.38
	(725.3)	(727.3)	(60.55)	(56.77)	(85.75)	(80.26)
Household head characteristics						
Secondary education or more	1221.8	1173.8	-23.24	-37.37	255.8	170.3
	(839.9)	(865.1)	(91.69)	(102.5)	(233.4)	(269.2)
Female	-243.1	-214.2	51.83	55.74	10.94	22.78
	(572.7)	(583.8)	(104.0)	(112.9)	(236.0)	(236.3)
Age	6.728	12.94	-4.204	-3.437	9.304	7.283
	(26.31)	(27.85)	(3.786)	(5.580)	(5.944)	(5.719)
Household level characteristics						
Household size	96.73	88.03	44.12*	47.41*	66.42*	57.97
	(73.76)	(73.98)	(19.30)	(19.55)	(30.90)	(29.31)
Registered in Conservancy	-350.3	-304.2	-308.5*	-259.5*	0	0
	(490.4)	(516.7)	(142.5)	(109.5)	(.)	(.)
Prop score baseline		309.1		478.1		1699.2
		(1231.3)		(799.8)		(2741.0)
Prop score endline		-273.7		171.5		-671.3*
		(579.9)		(111.2)		(302.3)
N	71	71	296	296	120	120

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head. Standard errors clustered at the household level in parentheses for Devil's Claw and Ximenia and bootstrapped for Marula. * p<0.05 ** p<0.01 *** p<0.001

Table 47: The effect of training on quantity sold – Devil's Claw

	ALL					PPO with Organic Certification
	(1)	(2)	(3)	(4)	(5)	(6)
Non-management training	-64.38	-66.43	-71.45	-57.76	-57.76	-43.92
	(65.53)	(39.20)	(36.06)	(37.57)	(37.57)	(50.84)
Household head characteristics						
Secondary education or more	68.30	8.562	24.37	5.284	5.284	-11.87
	(64.90)	(39.32)	(44.20)	(51.00)	(51.00)	(57.30)
Female	30.80	42.69	45.46	46.79	46.79	32.04
	(49.97)	(31.00)	(32.78)	(31.36)	(31.36)	(58.26)
Age	0.526	0.197	-0.159	-0.0205	-0.0205	0.605
	(2.264)	(1.288)	(1.631)	(1.584)	(1.584)	(2.033)
Household level characteristics						
Household size	2.001	-2.729	-2.949	-2.671	-2.671	-1.849
	(5.260)	(3.271)	(3.354)	(3.114)	(3.114)	(3.076)
Registered in Conservancy	6.905	24.03	25.19	28.04	28.04	24.31
	(29.96)	(27.62)	(27.57)	(28.85)	(28.85)	(34.80)
Total hours harvested		0.0489***	0.0490***	0.0521**	0.0521**	0.0583**
		(0.0130)	(0.0130)	(0.0145)	(0.0145)	(0.0169)
Prop score baseline			48.74	42.90	42.90	8.699
			(74.58)	(74.24)	(74.24)	(102.2)
Prop score endline			24.65	12.37	12.37	-9.531
			(47.14)	(46.95)	(46.95)	(65.64)
PPIG observed				0.0927	0.523	0.810
				(0.113)	(0.506)	(0.660)
PPIG predicted					-0.622	-0.941
					(0.569)	(0.738)
N	71	71	71	71	71	54

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head.
Standard errors clustered at the household level in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

Moving to INP sold quantities; Table 47 shows regression results for Devil's Claw. In the first column we can see that there is a negative relationship between training and sold quantities, although the coefficient is not significant. Although the effect is not significant, the sign of the coefficient is perhaps not too surprising as training for Devil's Claw may involve the introduction of more sustainable techniques, which in some cases may be associated with harvesting restrictions and, thus, lower productivity. In col-

umn 2 the number of hours harvesting INP is included as a covariate and, while the coefficient is positive and significant, its introduction doesn't affect the coefficient of training. In column 3 propensity scores for participation at baseline and endline are included, but the parameter of interest does not change much relative to that found in column 2. In column 4 we include PPIG funding as an additional covariate, but the effect of PPIG itself is not significant and the covariate's inclusion does not change the parameter for training either. Trying to control for observable characteristics that are correlated with the amount of resources received through PPIG, we also include the predicted value of PPIG as explained in equation (2); we find that the inclusion of this predicted value doesn't affect the estimate for PPIG, which remains positive but not significant. In the last column we restrict the sample to households in PPOs that are certified to produce organically; we can see that although the parameter on training declines in absolute value, it remains negative and not significant.

In Table 48 estimates for Marula are displayed. The three columns in the table correspond to the first three models in the Devil's Claw table. As it was explained before, there is no analysis on the effect of PPIG on Marula because no Marula PPO in the panel data received PPIG funds. In the first column we can see that there is a positive effect of training on sold quantities. The parameters imply that one additional training session is associated with 8 kg of additional sold quantity. This is a relatively large effect given that the mean at baseline was 22 kg. When we include hours harvesting the coefficient on training doesn't change, which was expected as there was no correlation between training and hours harvesting. Finally, when propensity scores for participation are included the parameter on training does not change significantly.

Table 48: The effect of training on quantity sold – Marula

	(1)	(2)	(3)
Non-management training	8.044*	7.981**	9.151**
	(3.437)	(2.505)	(3.418)
Household head characteristics			
Secondary education or more	12.09	12.24	12.81
	(8.060)	(9.116)	(7.997)
Female	15.66	15.34	12.56
	(10.42)	(10.83)	(11.29)
Age	0.647*	0.673	0.470
	(0.254)	(0.402)	(0.474)
Household level characteristics			
Household size	1.819*	1.546	1.316
	(0.923)	(0.939)	(1.013)
Registered in Conservancy	-24.21	-22.30	-25.91
	(23.70)	(22.86)	(25.70)
Total hours harvested		0.00618	0.00781
		(0.00620)	(0.00551)
Prop score baseline			-113.1
			(83.13)
Prop score endline			-12.32
			(6.413)
N	296	296	296

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head.
Bootstrapped standard errors in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

In Table 49 we find the results for Ximenia. Across all specifications the coefficient for training is rather small and not significant. Given that 2013 was such a bad year for Ximenia as consequence of the afore-mentioned drought, it is not surprising that training had no effect on sold quantities.

Table 49: The effect of training on quantity sold – Ximenia

	(1)	(2)	(3)
Non-management training	0.809	1.099	-0.544
	(6.003)	(6.377)	(6.046)
Household head characteristics			
Secondary education or more	-9.097	-8.016	-0.275
	(14.55)	(16.12)	(16.72)
Female	12.87	12.92	16.81
	(14.12)	(14.65)	(13.64)
Age	-1.080*	-1.041*	-0.873
	(0.449)	(0.457)	(0.518)
Household level characteristics			
Household size	1.820	2.101	2.044
	(1.504)	(1.638)	(1.645)
Total hours harvested		-0.00422	0.00172
		(0.00962)	(0.0104)
Prop score baseline			235.7
			(227.2)
Prop score endline			30.91**
			(10.27)
N	120	120	120

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head.
Standard errors clustered at the household level in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

In sum, we can see that non-management training had some positive effects on the quantity sold of Marula, but no effect of Devil's Claw or Ximenia. As explained before, given the adverse climatic conditions faced by Ximenia harvesters in 2013, it was to be expected that no intervention had the chance to positively affect the quantites sold.

For this research question, the qualitative data indicate that the trainings have had an effect on quality while the quantitative data indicate the the trainings have had an effect on quantity sold only for Marula. The effect on quantity of INP could not be assessed accurately from the qualitative data.

4.3 Research Question: Did the composition and level of household incomes change (more income sources, more diversification, and higher income)? (RQ8)

- Quantitative analysis only found positive effects of trainings on INP-related revenue for Marula
- Most harvesters perceive that INP is an important source of household income (although contribution to total household income varies by INP), especially as it is now more reliable due to regularity of harvest collection (as opposed to collection from *bakkie* buyers)
- General consensus from FGDs is that income from INP is insufficient to build up assets although some harvesters indicate that they are now able to save money which was impossible prior to participating in INP harvesting

Qualitative Results

As mentioned previously, the main motivation for households to start harvesting is to lift themselves out of poverty. Indeed, the steadiness of INP as an income source and the ability to plan is attractive to harvesters. Revenue from INPs is generally low, so the sector typically attracts marginalised people who do not have other alternative sources of income. As a result, San and Himba groups are very involved in Devil's Claw and Commiphora resin harvesting. For Devil's Claw, before the project, frequency of harvest collection from *bakkie* buyers (informal market middlemen) was uncertain while contractors now come reliably three or four times a year and pay higher prices.

> *"Because I am bringing in money, my mother regards me highly. I can even buy a 50 kilograms bag of maize meal." [Nkugoyepongo harvester, Marula]*
>
> *"When people hear that the Marula money has come, even the children in the house are happy because they know that they are going to get bread and a soap and lotion."*
>
> *"Now I can even pay for school fees of my children."*

Depending on the INP, income from the INP may constitute a major or minor portion of harvesters' total income. For instance, for some harvesters income from sales of Commiphora is their only source of income (although quantitative findings indicate that on average Commiphora is not the main source of income for harvesters). For Devil's Claw, George Mukoya FGD participants indicated that they earn more from basket weaving and crop harvesting since Devil's Claw harvest only happens once a year, and therefore that Devil's Claw income constitutes a small portion of their income. However quantitative data indicate that on average Devil's Claw constitutes a major source of income for most Devil's Claw harvesters. Quantitative data also indicate that Marula and Ximenia are not a major source of income for Marula and Ximenia harvesters.

There is a general perceived feeling that INP harvesting has affected household income. An increase in income seems to be logic for the new regions where INPs such as Devil's Claw had not been harvested before. FGDs also seem to indicate that improved sales from other resources might have led to higher

household income levels in other regions although the results are not easily generalizable given the small sample sizes of the FGDs. The general consensus is that revenue from INPs is insufficient to build up assets as INP harvesting is a seasonal activity that yields low revenues and that revenue is typically used to attend to the most basic needs such as food, school fees, etc. It is attractive as a supplemental income source for those who already have other income-generating activities and it is attractive for the unemployed. It appears that women spend their revenue mainly on school fees, clothing, and staple food since the majority of the beneficiaries are living below the poverty line and thus have to cater to these basic necessities first[66]. Harvesters, which are mostly women, feel that they are more respected by their family members as a result.

"Because I am bring ing in money, my mother regards me highly. I can even buy a 50 kilograms bag of maize meal." [Nkugoyepongo harvester, Marula]

"When people hear that the Marula money has come, even the children in the house are happy because they know that they are going to get bread and a soap and lotion."

"Now I can even pay for school fees of my children."

Management members of Puros indicate that the income from the sales of Commiphora has had a positive impact on them as it has helped to reduce poverty among the people, this view is broadly shared by management and non-management members alike. Most harvesters indicate that the improvement in their well-being is related to the fact the price per kg for Commiphora has increased from N$25 to N$50 as communicated by three different harvesters from the Puros FGD (although according to harvesters from other PPOs and from MCA-N reviewers, the price has always been N$50/kg)

"Everyone who feels that they are poor or in need, they go and gather the Commiphora and get the money." [Puros harvester, Commiphora]

For Devil's Claw PPOs, the impact on income seems mixed, according to FGD participants. Some harvesters from both Dzoti[67] and George Mukoya now harvest more than 4 years ago. This coupled with the fact that prices have increased translated into increases in income although some harvesters also mentioned that some people get discouraged since the resource is scarce and requires a lot of labor. On the other hand, some harvesters mentioned that the income earned by their households hasn't changed as

[66] Our survey data indicate that households spend about half of their income for food, clothes and school-related expenses.

[67] Note that Dzoti was not harvesting Devil's Claw before the MCA-N project.

a result of the assistance because in every household there is only one harvester and harvest only happens once a year which doesn't make a big difference.

Marula harvesters unanimously agreed that Marula harvesting has had a big impact on their income. Harvesters from all three PPOs interviewed through FGDs mentioned that their income has increased.

"Most of the assistance that we receive from CRIAA involves training. Just so that we can harvest efficiently and earn a better income. So the household income has changed because, if I used to receive N$20 from other sources and now I am also earning N$20 from Marula, then it means the income has increased."

Furthermore, another sign that household incomes have increased comes from the fact that some Marula harvesters are now able to save money, which they were not able to do previously.

"There is a big difference now especially when the amount of the kg was increased, which also did increase the income, I might have been assisted by someone to help me to pay a child school fees but then I was later able to pay without anyone's assistance. I even came at the stage where I can save for the future something that I never knew that I could do in my life. But if there was no Marula kernels project then I won't be able to save it. Now I am even able to open my own [bank] account which I never thought of in my whole life."

Finally, it seems that Ximenia harvesting has also had a positive impact on income although FGD participants from Eenhana did not voice this as strongly as participants harvesting other INPs. One harvester mentioned that she is now able to buy blankets and soap for the household and another said that thanks to harvesting Ximenia kernels, some households were able to purchase goats. It is unclear however if these changes occurred as a result of the training. In general, Ximenia harvesting is more difficult as the INP is directly affected by weather and the first two years of the projects saw unfavourable weather conditions.

Quantitative Results

In this section we use survey data to address RQ8 as well as RQ10 - Did household assets change (houses, bicycles, radios, television sets, telephones, etc.)? - and RQ11 - Did the composition of household financial assets change (savings, debt, borrowing, insurance)?

To study the effect of training on INP revenue, household assets and other constructs, our methodological approach follows the same model as the one implemented to analyze the effect of training on sold quantities; that is, we run household-fixed effects models to estimate the treatment effect on the different outcomes of interest.

Table 50 shows INP-related revenue, total income, assets and other summary statistics relevant to the financial situation of the surveyed households. In this table, as in any analyses in this section, amounts are presented in constant NAD of 2012. For all households, income from INP sales increased between baseline and endline, while when we focus on the panel households, the opposite pattern is observed. However, overall, sales of INP products remained relatively stable, and are only a small share of total household income and total household revenue. Also, we can see that total household revenue and income increased substantially between baseline and endline, regardless of whether we look at all the households or only the panel households. On the other hand, there was a decline in the value of assets reported by survey respondents. Finally, the data shows that there was an increase in the proportion of households with outstanding loans, and a decline in the proportion of households with any savings.

Table 50. PPO household financial summary statistics (2012 NAD).

	All households		Panel households	
	Baseline	Endline	Baseline	Endline
Cash income from sales of INP	629	737	579	556
Total household cash revenue	15,630	22,758	17,026	25,418
Household cash income (net revenue)	14,777	21,194	16,073	23,574
Total value of household assets	15,277	11,957	17,747	15,598
% of households with outstanding loans	4.8	9.0	5.1	11.7
% of households with savings	65.9	55.8	72.7	69.8
N	296	496	244	244

Source: NORC INP Household Surveys, 2011 and 2014.

These indicators suggest a rather puzzling financial outlook. On the one hand household revenue increased by more than 40% over these tree years (roughly 14% by year). At the same time, these better results in 'flows' did not reflect in similar results in 'stocks', as the value of households' assets decreased, households are saving less and are more indebted. By no means should this constitute a source of concern in itself. It may well be the case that better economic prospects cause less accumulation in the short run. As a deeper analysis behind these particular results surpasses the scope of this report, further research should probably focus on the mechanisms behind them.

In what follows, we focus on the effect of non-management training on INP revenue, as well as the other financial indicators; however, it is important to keep in mind that, while INP activities may have important effects for the economic situation of these households at the margin, it is not very likely that they will affect the overall financial situation of households, at least not on average.

Table 51 presents results for equation 2 for Devil's Claw and equation 1 for Marula and Ximenia. We focus on four different outcomes of interest; namely, INP revenue, household revenue, household income (revenue - expenses) and number of sources of income.

Table 51: The effect of training on INP revenue, Household revenue, Household income and Number of revenue sources.

	INP Revenue			Household Revenue			Household Income			Number of revenue sources		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Devils' Claw	Marula	Ximenia	Devils' Claw	Marula	Ximenia	Devils' Claw	Marula	Ximenia	Devils' Claw	Marula	Ximenia
Non-management training	-1194.0	219.9***	-6.148	-7202.7	477.7	-1666.4	-9405.9	1127.0	-1386.1	0.564	0.232	0.0512
	(788.8)	(61.51)	(75.69)	(10484.0)	(5061.6)	(3615.9)	(10155.0)	(6659.0)	(3637.5)	(0.780)	(0.129)	(0.168)
Household head characteristics												
Secondary education or more	86.53	304.7	4.655	9097.2	-7875.6	3345.9	10055.1	-12929.4	4593.6	-1.753	0.156	-0.209
	(1074.8)	(251.0)	(196.1)	(13375.3)	(10237.5)	(12153.8)	(13072.0)	(13120.7)	(12930.0)	(0.940)	(0.297)	(0.469)
Female	984.9	294.7	183.6	5077.2	-8041.1	-42052.9	5825.2	-5809.5	-40360.9	-0.223	-0.0529	0.250
	(657.9)	(264.2)	(154.9)	(8999.2)	(8625.3)	(24463.9)	(8192.4)	(11413.0)	(24994.7)	(0.459)	(0.287)	(0.452)
Age	0.327	11.11	-11.17	793.2*	-81.32	-1707.6	783.3*	-121.0	-1713.6	0.0214	-0.000177	-0.0118
	(33.23)	(11.44)	(6.145)	(383.1)	(240.0)	(1145.8)	(384.9)	(240.3)	(1168.5)	(0.0230)	(0.0194)	(0.0242)
Household level characteristics												
Household size	-61.38	31.03	29.25	1858.1	799.5	666.5	1833.4	948.5	642.0	-0.0340	0.0465	-0.0130
	(66.05)	(23.83)	(20.70)	(1362.4)	(1177.7)	(1405.1)	(1334.9)	(1636.9)	(1424.9)	(0.101)	(0.0427)	(0.0687)
Registered in Conservancy	631.1	-616.5		3672.4	-16879.1*		1621.4	-18295.0		1.182*	0.0849	
	(609.9)	(521.8)		(7356.3)	(7986.4)		(6916.8)	(11712.2)		(0.529)	(0.234)	
Total hours harvested	1.097***	0.187	-0.00133	-2.876	5.936	6.365	-2.641	6.093	6.418	0.000302	0.000478***	0.000405
	(0.305)	(0.141)	(0.129)	(3.539)	(4.583)	(7.357)	(3.466)	(5.589)	(7.279)	(0.000227)	(0.000120)	(0.000305)
Prop score baseline	913.5	-2704.8	2863.9	10836.0	-36366.2	-9924.6	9362.5	-39745.9	-1956.2	-1.040	2.696	-13.19*
	(1561.8)	(1925.7)	(2827.6)	(12538.6)	(80587.4)	(147340.6)	(11997.8)	(69640.3)	(146152.8)	(0.989)	(2.227)	(5.067)
Prop score endline	261.3	-293.6	316.6*	8861.1	-3454.6	1873.2	9761.8	-4428.1	1960.1	-0.525	-0.146	1.054*
	(986.1)	(153.5)	(125.8)	(10155.4)	(7454.7)	(7212.9)	(10165.1)	(6389.0)	(7282.6)	(0.693)	(0.205)	(0.419)
PPIG observed	9.911			-5.700			-22.44			0.00905		
	(9.078)			(98.74)			(94.28)			(0.00807)		
PPIG predicted	-11.74			2.125			20.90			-0.0102		
	(10.21)			(109.7)			(104.8)			(0.00892)		
N	71	296	120	71	296	120	71	296	120	71	296	120

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head.
Standard errors clustered at the household level in parentheses for Devil's Claw and Ximenia and bootstrapped for Marula. * p<0.05 ** p<0.01 *** p<0.001.

Looking at the results for INP revenue, we can see that the effect is negative but not significant for Devil's Claw, which is consistent with the results presented for quantities sold. We found a positive and significant effect of training on INP revenue for Marula.The estimate implies that for each training session INP revenue increased by NAD 220 a year. Finally, we find a negative but very small and insignificant effect for Ximenia. These results are consistent with our qualitative analysis, which found that Marula harvesters perceived their income had increased, but the case for other INP was less clear.

When we look at household revenue and household income we get similar results than those observed for INP revenue, except that all standard errors are much larger. This implies that we can't really identify with precision any effect of training on these constructs. This is not surprising as total income and revenue at the household level are affected by many more sources than those related to INP revenue. Although some of the coefficients are negative and very large in absolute value (specifically for Devil's Claw), they are also small relative to their respective standard errors. The last three columns display results for the number of household revenue sources. Although all the coefficients are positive, only for Marula the estimate is significant.

Aside from looking at the household financial 'flows', we also analyse the effect of training on household assets. For household assets we find a positive effect for Marula but is not significant at standard levels of confidence, although the parameter is relatively large compared to its standard error. The effects for Devil's Claw and Ximenia are negative but not significant. For loans there are no results displayed for Devil's Claw as only one household has a loan in the data, with respect to Marula and Ximenia, the effect of training on having a loan is negative but not significant. Finally, there seems to be no significant correlation between training and the probability of having any savings.

In conclusion, we can say that for Marula harvesters, training seems to have increased INP revenue (by an estimated NAD220 a year), but the effects for other INP were not distinguishable from zero. The qualitative data is in line with this finding as Marula harvesters voiced strongly that Marula income had increased as a result of the INP Activity and training attendance. For the other INPs, the qualitative data were not as conclusive although most FGD participants indicated that they believed INP income was important for their household, especially attractive is the regularity and predictability of payments.

Table 52 regression results for household fixed effects models are displayed for household assets (self-reported value), and for indicator variables for whether the household has an outstanding loan and for whether it has any savings.

For household assets we find a positive effect for Marula but is not significant at standard levels of confidence, although the parameter is relatively large compared to its standard error. The effects for Devil's Claw and Ximenia are negative but not significant. For loans there are no results displayed for Devil's Claw as only one household has a loan in the data, with respect to Marula and Ximenia, the effect of training on having a loan is negative but not significant. Finally, there seems to be no significant correlation between training and the probability of having any savings.

In conclusion, we can say that for Marula harvesters, training seems to have increased INP revenue (by an estimated NAD220 a year), but the effects for other INP were not distinguishable from zero. The qualitative data is in line with this finding as Marula harvesters voiced strongly that Marula income had increased as a result of the INP Activity and training attendance. For the other INPs, the qualitative data were not as conclusive although most FGD participants indicated that they believed INP income was important for their household, especially attractive is the regularity and predictability of payments.

Table 52: The effect of training on household assets, loans and savings

	Assets			Loans(a)		Saved		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Devils' Claw	Marula	Ximenia	Marula	Ximenia	Devils' Claw	Marula	Ximenia
Non-management training	-14536.9	5805.7	-192.7	-0.00474	-0.123	-0.0438	0.0533	0.0327
	(18451.7)	(3508.7)	(1545.7)	(0.0353)	(0.0725)	(0.131)	(0.0427)	(0.0985)
Household head characteristics								
Secondary education or more	3792.9	-7641.9	-4662.8	-0.0993	0.153	0.253	-0.0249	-0.311
	(13716.3)	(9062.8)	(5540.4)	(0.114)	(0.159)	(0.188)	(0.132)	(0.207)
Female	16273.4	-2190.1	124.5	0.171	0.179	-0.0507	-0.0884	0.0384
	(21257.7)	(8160.0)	(4638.1)	(0.0957)	(0.181)	(0.127)	(0.152)	(0.178)
Age	-225.3	39.27	-5.169	-0.000618	-0.00409	-0.00106	0.00232	-0.0182
	(423.2)	(338.7)	(107.9)	(0.00415)	(0.00670)	(0.00439)	(0.00611)	(0.0119)
Household level characteristics								
Household size	-310.9	898.9	1353.7	0.0132	0.0575*	-0.0220	0.00957	-0.0230
	(1211.9)	(1242.9)	(840.8)	(0.0194)	(0.0241)	(0.0112)	(0.0180)	(0.0259)
Registered in Conservancy	-23747.4	41680.9*		-0.0768		0.131	0.0804	
	(20532.7)	(16915.9)		(0.122)		(0.0694)	(0.125)	
Total hours harvested	0.197	-8.569*	-5.918*	-0.0000627	-0.0000384	0.00000180	-0.0000825	0.000201
	(4.163)	(3.710)	(2.919)	(0.0000580)	(0.0000925)	(0.0000379)	(0.0000823)	(0.000126)
Prop score baseline	7191.4	-74576.6	-31600.3	0.114	6.186*	0.0632	0.502	2.049
	(18593.6)	(72282.0)	(42091.8)	(0.973)	(2.766)	(0.241)	(0.928)	(3.891)
Prop score endline	6976.4	5336.3	-4440.6	-0.127	-0.00503	0.0780	-0.0749	-0.406*
	(11177.0)	(3448.1)	(3941.5)	(0.0876)	(0.125)	(0.168)	(0.118)	(0.163)
PPIG observed	-82.76					-0.00188		
	(141.2)					(0.00187)		
PPIG predicted	89.99					0.00211		
	(155.5)					(0.00208)		
N	71	292	120	296	120	71	296	120

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head. Four outliers for value of assets are dropped from the analysis. (a) Only one household harvesting Devil's Claw has a loan in the data. Standard errors clustered at the household level in parentheses for Devil's Claw and Ximenia and bootstrapped for Marula. * p<0.05 ** p<0.01 *** p<0.001.

4.4 Research Question: What changes are apparent in intra-household incomes and assets, including specifically around income earned by male and female household members? Does the intra-household distribution of income and employment by male and female household members change? (RQ9)

- INP harvest is an activity dominated by women except for Devil's Claw
- Qualitative and quantitative data make uncovering changes in intra-household incomes difficult however quantitative analysis suggests that training had a positive effect on earnings for female Marula harvesters

Qualitative Findings

INP harvest is an activity largely dominated by women except for Devil's Claw where the ratio of women to men was closer to 50:50 before the project and may be now closer to 60:40. Marula and Ximenia harvest activities are done almost exclusively by women. Marula PPOs' membership is mainly composed of elderly women and young rural mothers with the management committees often consisting of retired and slightly better educated women such as previous teachers. Ximenia PPOs are similar although men are theoretically allowed. Commiphora resin as a new resource is also mostly women dominated, although gathering Commiphora resin requires travelling long distances and women may feel safer in the presence of men.

Unfortunately both the qualitative and quantitative data make uncovering and attributing and changes in intra-household incomes and assets difficult. Moreover, we feel RQ12 is better able to qualitatively uncover intra-household changes picked up by the evaluation and our findings are presented under that research question.

Quantitative Findings

In this section we analyze income sources between households headed by males and females, how income distribution changed over time within the household, as well as the effect of training specifically on females' earnings (effect of training on overall revenue was discussed earlier). As can be seen in Table 53, both at baseline and endline the number of household members working on INP activities is greater in male headed households, although the differences are not significant. Regarding other crops, we can see that the number of household members working on these activities is lower in households headed by males at endline, and the difference is significant at the 5% level. Also, the number of household members earning wages increased between baseline and endline, regardless of the gender of the household head. Finally, a very small fraction of household members earned income from conservancies both at baseline and endline, although at endline the difference in favour of households headed by males is significant.

Table 53: Number of household-members laborers, by type and gender of household head

	Baseline			Endline		
	Female	Male	Signif	Female	Male	Signif
INP activities	1.35	1.49	-	1.02	1.17	-
Other crop activity	1.77	1.82	-	1.89	1.52	*
Wage income	0.16	0.24	-	0.41	0.49	-
Conservancy labor	0.00	0.02	-	0.02	0.07	**
Total number of working-age household members	3.18	3.87	**	3.54	4.00	*

Source: Own calculations using NORC INP Household Survey 2014.

The data also indicates that households headed by males are more affluent than those headed by females. As Table 54 shows, households headed by males have higher income and assets than household headed by females, both at baseline and endline.

Table 54: Household income and assets by head of household's gender

Head of household's gender	Baseline		Endline	
	Household income	Household assets	Household income	Household assets
Female	8,443	12,412	18,244	9,392
Male	12,468	15,953	24,594	14,041

Source: Own calculations using NORC INP Household Survey 2011 and 2014.

Of course, if we want to analyze the impact of training on females' earnings it is not enough to look at differences between households headed by males and households headed by females, as this will overlook what may be happening with the (female) spouse in households headed by males. For this reason we constructed a measure of female earnings from INP that is equal to the earnings of the household head if the head is female, and equal to the earnings of the spouse if the household head is a male.[68]

Table 55 presents summary statistics for female INP revenue (both the level in NAD of 2012 and as a share of total INP revenue) between baseline and endline. We can see that for Devil's claw female revenue increased substantially, which is consistent with the overall increase associated to this INP documented before. With respect to the female revenue as a share of total revenue, the fraction actually decreased on average, although the change is not significant. We also present the analysis of female-only revenue for Marula and Ximenia, although as mentioned most harvesters for these two INPs are women. With respect to Marula we can observe a small decrease in female revenue, although not

[68] To estimate INP revenue by household member we distribute the value of the INP sold according the number of hours each household member worked harvesting INP.

significant, while as a share of total INP revenue there is basically no change between baseline and enline. Regarding Ximenia, there is a major fall on female revenue, consistent with findings already documented. While there is also a decline in the share of female revenue, this is not significant.

Table 55: Female revenue between baseline and endline

	Baseline	Endline	signif.
Devil' claw			
Female INP Revenue (NAD of 2012)	381.7	710.5	*
Female/Total INP revenue	0.6	0.5	-
Marula			
Female INP Revenue (NAD of 2012)	305.2	288.3	-
Female/Total INP revenue	0.7	0.7	-
Ximenia			
Female INP Revenue (NAD of 2012)	288.8	42.2	***
Female/Total INP revenue	0.6	0.4	-

* p<0.05 ** p<0.01 *** p<0.001

Source: Own calculations using NORC INP Household Survey 2011 and 2014.

To analyze the effect of training on females' earnings we use the fixed effects framework described before on our constructed variable on females' INP earnings. In Table 56 results for this exercise are shown.

The first three columns correspond to the level of female INP Revenue. For Devil's Claw we can see the parameter is negative but not significant. That there is no effect for females on Devil's Claw is hardly surprising as we did not find a positive effect for Devil's Claw at all. For Marula, on the other hand, we find a positive and significant effect of training. Again, this was to be expected as we found before a positive effect of training on INP revenue, so given the fact that Marula harvesting is an activity dominated by females, it is no surprise that there is a positive effect of training on females' earnings. Finally, we found a positive but not significant effect for Ximenia harvesters. The last three columns show results for female INP revenue as a share of total INP revenue. Although all the coefficients are positive, none of them are significant. Note that the share of female over total INP revenue can only be calculated if the latter is greater than zero, so we lose a few observations in this exercise as some households observe zero INP revenue in our data set.

In sum, it seems that training has a positive effect on earnings for female Marula harvesters, but no effect for the other two INP analyzed.

Table 56: The effect of training on females INP earnings, by INP.

	Female INP Revenue			Female INP Revenue / Total INP Revenue		
	(1)	(2)	(3)	(4)	(5)	(6)
	Devils' Claw	Marula	Ximenia	Devils' Claw	Marula	Ximenia
Non-management training	-209.6	145.6*	52.91	0.143	0.0445	0.123
	(394.1)	(56.98)	(86.49)	(0.162)	(0.0803)	(0.243)
Household head characteristics						
Secondary education or more	-134.5	272.0	-113.7	0.353	-0.135	-0.0981
	(436.4)	(138.9)	(140.6)	(0.190)	(0.168)	(0.446)
Female	540.5	576.7*	30.05	1.002***	0.369*	-0.473
	(405.5)	(278.3)	(155.8)	(0.140)	(0.149)	(0.302)
Age	-30.50*	15.88	-1.375	-0.0162**	-0.00128	-0.0167
	(12.02)	(9.472)	(5.257)	(0.00556)	(0.00565)	(0.0230)
Household level characteristics						
Household size	-4.822	39.69	-17.17	-0.0444*	-0.00889	-0.0660
	(39.32)	(23.66)	(17.26)	(0.0202)	(0.0202)	(0.0761)
Registered in Conservancy	-152.3	-107.7	0	0.129	0.00262	0
	(221.7)	(195.2)	(.)	(0.168)	(0.131)	(.)
Total hours harvested	0.116	-0.122	0.00772	-0.000275***	-0.000278***	-0.0000470
	(0.136)	(0.0716)	(0.0852)	(0.0000653)	(0.0000585)	(0.000305)
Prop score baseline	-199.6	584.1	1452.5	0.652*	0.893	5.620
	(801.7)	(890.9)	(1790.0)	(0.288)	(0.812)	(3.229)
Prop score endline	524.1	10.66	241.1*	0.990***	0.259***	0.287
	(418.1)	(88.16)	(119.5)	(0.131)	(0.0552)	(0.188)
PPIG observed	4.365			-0.00283***		
	(4.528)			(0.000779)		
PPIG predicted	-5.082			0.00332***		
	(5.100)			(0.000823)		
N	71	304	131	56	271	84

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head. The analysis is done at the household-INP level, with the objective of being able of distributing revenue according to hours harvesting by household member. Given that a handful of households reported harvesting both Ximenia and Marula, when doing the analysis at the household-INP level the sample sizes are a little larger than when we do the analysis at the household level. Standard errors clustered at the household level in parentheses for Devil's Claw and Ximenia and bootstrapped for Marula. * p<0.05 ** p<0.01 *** p<0.001

4.5 Research Question: What is the perceived impact on household gender relationships from the intervention among recipients? (RQ12)

- Qualitative data strongly suggest that the intervention contributed to women have a stronger voice and participate more in decision making as reflected by increasingly high involvement of women in board and management activities
- Most FGD participants felt that household gender relationships have changed as they are now able to make decisions together with their husbands on how to spend income
- However, other harvesters also noted that the husband will always be the head of the household and that men can spend their income on personal expenses while women are expected to use their income for the entire household

Qualitative Findings

First, we note that this research question was designed to be answered through qualitative methods only. Therefore there is no quantitative discussion. As mentioned earlier, INP harvesting activities in Namibia and probably in most areas of Africa are traditionally performed by female members of the household. Therefore the involvement of women was overwhelmingly high from the beginning of the project with the exception of Devil's Claw because of the more strenuous work required for digging out Devil's Claw tubers. Before the project, male involvement in Devil's Claw activities was sometimes reflected in a disproportional representation of men on the boards of PPOs. Women took part but were not as actively involved in committee decisions. Their participation in decision making was in general lower although this differed from region to region and from PPO to PPO. This has changed very much with the project as women have been trained to voice their opinions publicly and are increasingly doing so. This is reflected by the increasingly high involvement of women in board and management activities.

In general, FGD participants' responses fell into two categories:

a. Most participants communicated that household gender relationships have changed as women and men are now able to make decisions together on how to spend their income. As one harvester from Otju-West indicated *"it has helped the women because now they can voice their opinions because they contribute to the household economy."* Female harvesters indicated that they now sit down together with their husbands to decide how to spend the money, whether to buy household items or pay for their children's school fees. Another harvester indicated that sometimes her husband stays home to take care of the children while she goes to the field to harvest. There is a sense that women feel confident speaking openly in front of men, due to the trainings, and that they make decisions together with their husbands.

b. Other harvesters, while agreeing that relationships between men and women may have changed, also indicate that men expect women to use their income for the entire household while they use theirs for personal expenses (alcohol, car). One harvester from Puros indicated that the way she is treated has changed *"but her husband will always be the head of the household. All the money first goes to him but [they] decide together on the budget or on the things that are needed for the household."*

One harvester from George Mukoya highlighted a consequence of the trainings which was not voiced by anyone else: *"My view is that both men and women in the household are supposed to receive the training, and not only one person in the household. Say for example, the woman goes and gets the training, when she comes and tells the husband that this is the way we should use the money, then the man gets angry."*

4.6 Research Question: What is the combined effect of being part of a conservancy and PPO member among women? (RQ13)

- The sense is that PPOs managed by conservancies have an advantage over other PPOs (and that INP harvesting is a good benefit for conservancy members as benefits go directly to members)

Qualitative Findings

When looking at the combined effect of being part of a PPO and a Conservancy it is important to understand the structural differences between types of PPOs. For Devil's Claw and Commiphora, practically all PPOs are managed through conservancy management committees. This can be contrasted with the EWC (Marula) and TTC (Ximenia) models in which a central management body collects resources from member PPOs. Finally, there is a small subset of PPOs which harvest and sell DC and Commiphora independent of a conservancy management committee or centralized management group.

Conservancy members who are also part of a PPO have an advantage in that they receive direct cash benefits from the PPO/Conservancy while other conservancy benefits (such as meat and money distributions) are distributed through the conservancy management committee and at times diluted through the benefit sharing approach.

Furthermore, NRI and CDSS collaborate on trainings with CDSS taking the lead on management focused trainings (book keeping, management plans) and NRI focused on INP specific issues (sustainable harvesting, buying point management). The benefit of being part of both a conservancy and PPO becomes clearer in that trainings focused on conservancy management has a trickledown effect in impacting PPO specific management structures. For example, developing an integrated conservancy business plan will benefit conservancy specific activities as well as INP specific activities.

A key informant indicated that increased revenue from other conservancy activities may also help them remain viable as INP sellers since the conservancy can, ideally, support INP activities during slow harvesting years. On the other hand if the conservancy as a whole isn't strengthened, it may put INP activities at risk since, overtime, the INP becomes dependent on the structures within the conservancy. For Ximenia and Marula, PPOs are part of a cooperative (Eudafano and TTC) which is a different business model and, according to a key informant, this business model may be more advantageous because these PPOs are focused solely on the INP whereas conservancies have multiple interests.

In the end though, it is our opinion that the benefits of being part of a conservancy based PPO outweigh the possible risks.

According to a key informant, one success story of the MCA-N intervention is the OPF visitor center in Kunene which demonstrates the beneficial overlap of CS and INP activities. CDSS funded the visitor

center with MCA-N grant money and NRI worked with the Commiphora harvesters to strengthen the supply chain therefore providing content for the visitor center.

In summary, the most important aspects of being part of a PPO within a conservancy, voiced by both FGD participants and KII respondents, was that money coming from INP harvesting goes directly to the harvesters. Unlike other conservancy activities where benefits are distributed among members, harvesting directly affects harvesters through cash pay-outs. In addition, since conservancy management committees often double as PPO management committees it means highly functioning conservancies are able to use their management skills (trainings by CDSS) to improve the management and selling of INPs.

Quantitative Findings

In this section we use household fixed effects models to analyze the combined effect of training and being registered in a conservancy. None of the households in the panel data harvesting Ximenia reported being registered in a Conservancy, so this analysis is only attempted for households harvesting Devil's Claw and Marula.

In sum, the quantitative analysis does not support the qualitative data. However, as noted, the sample sizes are small which may explain the lack of significant effects

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Table 57 shows regression results for female INP revenue as defined when we addressed RQ9, adding an interaction term between training and being registered in a conservancy. The results for Devil's Claw are somehow puzzling. While introducing the interaction term makes both the effect of training and being registered in a conservancy positive and significant (which was not the case in the specification without the interaction), the interaction term itself is negative and significant. This suggest that both training and being registered in a conservancy have a positive effect on females' INP earnings independently, but participating in both offsets part of the positive effect. However, it is worth saying that introducing interaction terms in such a small sample may be simply picking up idiosyncrasies of few observations, rather than a general feature of the underlying data generating process. For Marula the results are relatively more predictable, the coefficient on training is positive and significant, while the interacttion and the parameter on the dummy for being in a conservancy are not. In other words, for Marula we keep finding a positive effect for training, but no effect for being registered in a conservancy or the interaction term. Given that only 14 households in the panel harvest Marula and are registered in a conservancy, and that of these 14 only 5 received training, it was to be expected that no effects would be found.

In sum, the quantitative analysis does not support the qualitative data. However, as noted, the sample sizes are small which may explain the lack of significant effects.

Table 57: The effect of training and being registered in a Conservancy on females INP earnings.

	female INP Revenue		female INP Rev./Total INP Rev.	
	(1)	(2)	(3)	(4)
	Devils' Claw	Marula	Devils' Claw	Marula
Non-management training	1503.4*	146.0*	-0.231	0.0423
	(619.4)	(64.50)	(0.263)	(0.0607)
Non-management training X registered in Conservancy	-1323.5**	-28.52	0.230	0.137
	(403.4)	(284.2)	(0.127)	(0.195)
Household head characteristics				
Secondary education or more	-54.66	272.1	0.380	-0.137
	(328.7)	(142.8)	(0.206)	(0.133)
Female	545.4	575.7	1.097***	0.370**
	(317.6)	(325.5)	(0.133)	(0.119)
Age	-15.55	15.83	-0.0215**	-0.00110
	(9.615)	(12.50)	(0.00624)	(0.00339)
Household level characteristics				
Household size	-78.59*	39.72*	-0.0301	-0.00905
	(35.03)	(17.19)	(0.0211)	(0.0202)
Registered in Conservancy	1245.9**	-97.84	-0.160	-0.0483
	(446.5)	(259.1)	(0.209)	(0.215)
Total hours harvested	0.272**	-0.121	-0.000312***	-0.000282***
	(0.0930)	(0.0625)	(0.0000739)	(0.0000559)
Prop score baseline	-384.7	573.6	0.770**	0.951
	(638.1)	(1069.8)	(0.274)	(0.638)
Prop score endline	389.2	7.328	1.098***	0.276***
	(369.0)	(80.26)	(0.128)	(0.0825)
PPIG observed	4.443		-0.00289***	
	(4.381)		(0.000731)	
PPIG predicted	-5.018		0.00337***	
	(4.919)		(0.000770)	
N	71	304	56	271

Source: Own calculations using NORC INP Household Surveys, 2011 and 2014.
Notes: All specifications include household fixed effects, dummies for region and round interactions and dummies for missing age and education of the household head. The analysis is done at the household-INP level, with the objective of being able of distributing revenue according to hours harvesting by household member. Given that a handful of households reported harvesting both Ximenia and Marula, when doing the analysis at the household-INP level the sample sizes are a little larger than when we do the analysis at the household level. Standard errors clustered at the household level in parentheses for Devil's Claw and bootstrapped for Marula. * p<0.05 ** p<0.01 *** p<0.001.

4.7 Research Question: For the PPO did the technical assistance improve organisational capacity to manage the business and income/revenue? (RQ4)

- According to key informants, the INP Activity strengthened the sector as a whole as it was much smaller and disorganized before the intervention
- Harvesters' assessment of PPO management is mixed. Some indicate that their PPO is well managed (e.g. Devil's Claw PPOs) while others indicate the contrary (e.g. Commiphora Otju-West PPO)
- Most PPOs would still like to receive more external assistance and training

Qualitative Findings

First, it is important to note that this research question did not lend itself to quantitative analysis and our findings are based solely on qualitative interviews and research.

> *Since we got training we are improving in all aspects in management. When you get training on how to manage any organization you will do it properly since you know what to do. [Dzoti harvester, Devil's Claw]*

According to almost all key informants, the INP sector was much smaller before the intervention with less harvesters and more fragmentation within the sector as multiple stakeholders worked independently with harvesters and harvester institutions without collaboration. Furthermore, organizational institutional capacity was not high. Now, trainings provided by the INP Activity on harvesting practices are widely implemented by harvesters but higher level trainings targeted at PPO management are more difficult to implement although trainings on leadership and bookkeeping are very much appreciated by the PPOs.

"There is income that was always just being recorded in the book by a treasurer in the past, but now we got a book which is signed every time we enter the amount that was received and spent, also every entry is signed for. We also have AGM, we listen about the financial management information, how they came in, how they were spent and so on. That is managed by the chair person. It allows us to know how much money we received and it gives us a lot of knowledge." [Kuupenda harvester, Marula]

Some harvesters feel that their PPO is well managed. This is the case for the Devil's Claw PPOs, Dzoti and George Mukoya. Management members from Dzoti mentioned that they communicate sales prices to their harvesters as soon as they signed a contract with the buyer which allows harvesters to know how much they will get paid prior to harvest. They also have resource monitors who are in charge of ensuring that the resource base is sustainable and they send patrols that scout locations which have an abundance of Devil's Claw so that they can direct their harvesters to these areas when harvest begins.

"Business is good we are getting money because the group is managed well and everything is communicated to us in time, we practice good harvesting manners and when there are new prices it's passed to us on time by our management team." [Dzoti harvester, Devil's Claw]

On the other hand, Otjiu-West management was perceived negatively by the majority of harvesters. This is due to the fact that management doesn't seem to communicate well to harvesters when they will be in the office such that harvesters who themselves have travelled long distances end up waiting to get their harvest weighed for hours or even days. An MCA-N reviewer noted, however, that Otju-West covers a very large area with no cellphone coverage making communications difficult:

"The management is bad because they sometimes tell us to wait until whatever time because they have their own things to attend before weighing the products, not bearing in mind that some of us have to travel to another village such as Onganga to attend to the children." [Otjiu-West harvester, Commiphora]

The other Commiphora PPO in our sample, Puros is perceived more positively by harvesters because the weighing process seems more transparent thanks to the scale. Furthermore, the amount of harvest targeted by the PPO is known such that rather than accepting full harvests from a few harvesters, the PPO accepts a portion of the harvest from all harvesters, meaning that all harvesters get a bit of income. This is seen as more equitable. However, multiple harvesters from the Puros FGDs mentioned issues with transportation. Several harvesters would like Puros to provide transportation for harvesters especially as they have to travel long distances and Commiphora Resin is heavy to carry.

In terms of marketing, the only PPO for which this was discussed was Nkugoyepongo. During the Nkugoyepongo FGD, one harvester indicated that marketing had improved as prices increased. However, on the whole, when moderators tried to understand if the Marula PPOs' organizational capacity had increased, most respondents discussed the effects of the trainings on the quantity and quality of the harvest rather than the management of the PPO.

"In the past the price per kg was too low […] people at Eudafano realized that they must consider our efforts so since we are getting good sales, they must also get a better deal for their products and they started to increase the price per kg gradually". [Nkugoyepongo harvester, Marula]

In terms of price negotiation which are typically set before the harvesting season begins, prices are negotiated between the conservancy management committee or the Eudafano and TTC management boards and the institutions and buyers (with only one buyer per species except Marula, although Devil's Claw PPOs put out a request for Expressions of Interest for new buyers and now have several to choose from. Devil's Claw PPOs also managed to negotiate higher sales prices). However, these negotiations still occur with a significant amount of help from NRI and other implementing agencies, according to two key informants.

For Ximenia, while a key informant noted that TTC did increase in capacity and geographic scope due to the project, and the project contributed to increasing the organizational capacity of harvesters, CRIAA still takes a lead role in negotiating prices and finding new buyers because TTC lacks professional staff and facilities for processing and management. This is confirmed by the Eenhana FGD:

"CRIAA is again playing a big role in our business. We know that it is our father and mother. Because after harvesting our Ximenia, we give it to them to sell it for us and they then send the money back to us for us to distribute to our members." [Eenhana management, Ximenia]

CRIAA currently owns the only Ximenia processing facility in Namibia and buys, processes and sells the resource for harvesters. That said, TTC is now seeking funding to build a processing facility so that it can manage the entire supply chain. Although this is a positive step forward in bringing TTC to the same level as EWC, it has been noted that TTC requires start-up capital in order to truly take the next step towards sustainability.

For Devil's Claw as well, IRDNC still plays a big role as they are critical in securing buyers for the PPO. Most management members believe that they would not be able to stand on their own without continued technical assistance:

"I don't believe that we can do things on our own because what happens is we tell IRDNC what we want and we don't know where and with whom they speak to about our needs, then in the end we get an answer. Maybe these people speak to people overseas where we can't reach. When they will be gone we will not sell anything." [Dzoti management, Devil's Claw]

George Mukoya management members are also mixed in their assessment of the PPO's ability to do business on their own. Management staff indicated that they feel more confident in managing their business although non-management harvesters do not seem to have felt any changes in their PPO's management practices. Some believe that they could stand on their own without NNF assistance. One harvester cited as an example that for the past two years, it was the management members who trained the harvesters. However another havester mentioned that the group would not function well because of the high turnover of management staff.

In general, most PPOs requested more assistance and external support. The general view amongst key informants is that the majority of PPOs will still need external support after the end of the project or they may risk collapsing. According to the key informant interviews, it appears that implementing partners are still managing the resource flow and resource marketing on behalf of most PPOs. This seems to be especially the case for Devil's Claw, Ximenia and Commiphora PPOs. As for Marula, it would seem that after years of support, EWC has gained a certain level of independence from donor support especially in processing the kernels. In addition, some private sector partners are continuously investing in the supply chain structures of Marula and Devil's Claw in order to keep them functioning (they are planning to hire or are already hiring field personnel to support the communities in managing their organisations). In particular, the marketing of Devil's Claw is not functioning independently. One IP key

informant indicated that no progress had been made so far with Commiphora resin PPOs in terms of their business capacities due to the little activity that has happened with the Commiphora PPOs.

Interviews with private sector informants[69] indicate that they are planning on hiring additional staff to solve the issue of inadequate management capacities dependent on the quality and consistency of harvested resources. The key constraint facing private sector investment in INP development seems to be a consistent and high quality resource base. As such, the MCA-N intervention, focused in part on consistent high quality harvesting, may directly impact greater private sector involvement in supply chain management, especially for Devil's Claw and Marula.

In summary, while there have been improvements in PPO organizational capacity, it does not appear that PPOs can currently manage their business and income/revenue on their own as most PPOs seem to be largely managed with the help of implementing partners and the private sector (specifically those interviewed as part of this data collection). It seems unlikely that PPOs will become completely independent by the time the project ends; most will still need external support to continue moving forward. In particular, most PPOs indicated that they would still trainings, especially in topics such as financial planning, management, business planning especially as the turnover of management staff remains a problem.

[69] From the midline round.

4.8 Research Question: To what extent has the Delivery of Market Information Sub-Activity contributed to increased understanding of the broader INP sector (e.g., volumes, markets, key players, etc.)? (RQ2)

- The original idea of the market information tool as an information dissemination tool did not materialize as buyers did not want to reveal their prices
- The project then morphed into a market bulletin through the funding of an onsite staff person at the IPTT
- However most informants indicate that the market bulletin, while appreciated, had little impact on the sector and that it will disappear post-Compact

Qualitative Findings

It is important to note that this research question did not lend itself to quantitative analysis and our findings are based solely on qualitative interviews and research.

The original intent of the market information tool was to serve as a market information dissemination tool with transparent information on pricing. The delivery of market information sub-activity was to create a database similar to those of conventional agricultural commodities, however too little information concerning INPs was available to maintain such a database. It also became apparent in the early stages of the project that buyers did not want to reveal prices as prices needed to be confidential to spur competitiveness. This activity therefore morphed into a market bulletin, i.e. a quarterly report describing recent events in the INP sector in order to increase awareness of the sector including information on the volume, market, and key players involved. However, two key informants indicated that the market information tool was *"a failure from the start"* and *"ill-conceived"* and most informants agreed that the Market Bulletin had a negligible impact on the sector. One key informant from an implementing agency indicated that he did read the market bulletin but that he does not use it in his day to day activities.

The market bulletin was developed with the support of MCA-N through the funding of an onsite staff person at the IPTT. However, after the Compact ends, the Market Bulletin will likely disappear.

In discussing the market bulletin with key experts it became clear that, although the bulletin was not as successful as hoped, the idea of a marketing component is essential for the future of the project.

The current Compact focused monies and energy on harvesters and harvester groups. In essence the focus was on the supply side of the value chain with not enough attention spent on the demand side of the chain in opening up new markets and presenting Namibian INPs to the world. Although the intervention as a whole did increase the number of harvesters and the quality of the harvest, this was only one side of the coin. Without a strong marketing component it is difficult to sustain the project into the future. As such, future donors should be aware of the importance of strengthening and developing the demand side while at the same time improving the supply side.

4.9 Research Question: How did new developments from the INP Innovation Fund impact on the INP sector? (RQ7)

- The Innovation Fund funded nine projects of whichh two were considered outstanding
- However there was insufficient time to implement the results coming out of the research studies

Qualitative Findings

Again we note that this research question did not lend itself to quantitative analysis and our findings are based solely on qualitative interviews and research. The Innovation Fund was set up to fund research projects that could advance the INP sector. During the course of the project three calls for proposals were announced resulting in a total of nine approved grants. Of the nine approved grants, two are dealing with value addition of INPs ("Innovative Joint Health Ingredient obtained from Devil's Claw obtained for the US Markets", "Namibian Essential Oil Innovation (NEOi) Project") and according to key informants, are regarded as outstanding projects while two-three other grants appear to be slightly less promising in terms of value for money, especially the NOBO project ("Namibian Business Opportunities for the Opuwo Processing Facility Project"). Overall, key informants indicated that the projects were interesting but that the process was slow. While this may not have been the intent of the grants, key informants communicated regret that there was not enough time to implement the results coming out of these research studies. Another key informant indicated that the research should have been more focused on the Namibian context rather than general advances in INP processing.

On the one hand, according to interviews with the private sector, the private sector as a recipient of funds holds a definite positive view that the grants are either enabling them to start a small business or helping them to improve an existing business. The Fund seemed especially helpful in terms of product development and future Devil's Claw value addition in the country. There is a possibility that the funded work will generate employment in the country. Currently the value of domestic processing of Devil's Claw is at 5 – 7 % of the raw material price. This value is expected to increase to 35-40 % which would be a 6-fold increase for some of the raw material produced. However, the raw material volume could potentially increase to 600 t/a with the innovations introduced although there is still uncertainty as to whether the resource base can supply this level of production given the recent high yields that may not be sustainable.

On the other hand, key informants from implementing entities did not seem as enthusiastic about the Fund. Their perception is that the Innovation Fund has had no impact yet given that most projects were just at the initial stages of research at the time of the midline qualitative data collection and it seems that most of the final outcomes are unclear as further funding beyond the project remains uncertain. Except for stand-alone projects such as receiving plant specification sheets or improved oil pressing machinery, few of the IF projects will go beyond their initial stage before the end of the MCA Namibia Compact. It will thus be difficult for them to reach their expected outcomes as delineated in the project descriptions available on MCA-N's website. Further funding beyond the project would be needed to

implement the research findings that came out of these projects, which have been described as helpful with regards to pursuing innovations related to harvesting, processing and marketing.

Overall, reviews are mixed regarding the effectiveness of the Fund. The private sector key informants views it very positively while the implementing partner key informants were not as positive given that many projects will not be funded beyond initial stages. This also suggests that the associated evaluation question is not suitable for analysis using quantitative methods.

4.10 Research Question: How has the re-organisation of the Indigenous Plant Task Team contributed to the growth and sustainability of the INP sector? (RQ6)

- The re-organisation that the IPTT underwent during the MCA-N Compact was welcome by stakeholders as the IPTT is seen as a valuable component of the INP sector
- However, the MCA-N was functioning as the informal IPTT since it holds the funding and it is therefore unclear how much it has contributed to the INP sector
- Discussions are underway to discuss the future of the IPTT

Qualitative Findings

This research question also did not lend itself to quantitative analysis and our findings are based solely on qualitative interviews and research. The Indigenous Plant Task Team (IPTT) was formed in 2000 because the Government of Namibia wanted to include INPs in development efforts. It is housed within the National Botanical Research Institute (NBRI) which falls within the Ministry of Agriculture. The IPTT functions as a warehouse for research, centralization of information and dissemination. It is primarily conceptualised as a dialog forum for the INP stakeholders in the country to discuss new developments and shape domestic strategies to enhance the INP sector in Namibia. One key informant indicated that the IPTT was essential to the initial development of the INP sector in Namibia as it assisted in securing funds for projects. When the MCA Namibia Compact was established, an IPTT organizational audit was conducted and several recommendations for improvement of the IPTT were made. All key informants agreed that the IPTT was not fulfilling its full mandate before the most recent audit and re-organisation led by MCA-N[70] and agreed to by the IPTT in 2011.

After this re-organisation the IPTT became more attractive to stakeholders, which boosted attendance to meetings and participation of the civil society, government and private sector. The general perception is that the IPTT is a valuable component of the INP sector in Namibia contributing to a more comprehensive understanding of the problems in the sector and a platform to pull together strengths from different stakeholders. However, some isolated voices did criticize the IPTT for lacking the resources to be an effective lobbying body for the INP sector. According to a key informant, the management committee staff are unfortunately too busy with other tasks to dedicate the necessary amount of attention to the IPTT. Furthermore, another key informant noted that MCA-N funded audits were never clear about what the mandate of the IPTT was and not all recommendations from the audit were implemented.

A key informant also indicated that MCA-N has been functioning as the informal IPTT since it holds the funding; stressing that it wasn't a negative thing but that the IPTT should have been more integrated

[70] An initial audit was conducted by GoN in 2007 and followed up in 2010 and 2011 through MCA-N funding.

with MCA-N in order to ensure sustainability. It is therefore unclear how much the IPTT has contributed to the growth and sustainability of the INP sector over the life of the compact, their role will be more pronounced post-compact. It has been suggested that some of the post-project support to the PPOs and the private sector should be taken over by IPTT if necessary funds can be acquired.

The most salient current function of the IPTT is as a central repository and dissemination body for the findings coming out of the MCA-N Innovation Fund. The data from these important projects will be stored at the IPTT and made available to authorized users in the future.

A workshop was conducted in July of 2014 in order to understand where the sector is headed and to gather lessons learned on the INP Sector. Discussions are currently under way in Namibia to review the scope of the IPTT. The scope of the IPTT could be reduced, to a dissemination body, or increased, to work with research institutes and various government bodies. According to a key informant, there needs to be a vision about what is still required for each INP as this would help the IPTT determine where it can add value after the end of Compact and help shape the direction that the IPTT should take. In short, the IPTT could serve as a central point for sustainable INP harvesting in the future. However, both sector players and government units would need to support the IPTT to a greater extent than is now visible.

4.11 Research Question: How sustainable are the results in terms of increased production, sales and income? E.g., market chain (are there long-term buyer contracts in place, are the institutions functional and independent). (RQ5)

- Many PPOs are still dependent on external suport from implementing entities and will need continuous training especially due to management staff turnover which is one of the biggest risks to sustainability
- Ximenia is particularly sensitive to weather conditions and it is therefore difficult to guarantee a stable supply. CRIAA still plays a big role in support Ximenia PPOs.
- For Devil's Claw, it seems that the commercialization of the INP may be an issue. Harvesters mentioned that finding buyers without the assistance of IRDNC would be an issue and that they relay too much on outsiders
- For Marula, EWC manages its supply chain almost completely independently from CRIAA. The establishment of the processing facility was instrument in the success of EWC. Some PPOs believe that they could stand on their own while others do not.
- For Commiphora, the Kunene PPOs appear to still be lacking basic organisational capacities and PPOs do not believe that could survive without external assistance.
- There is a sense that the intervention did not focus sufficiently on the demand side, which is a threat to the sustainability of the INP sector as a whole

Qualitative Findings

This question is answered solely based on qualitative data and research.

The sustainability of the results in terms of increased production, sales and income is dependent on the sustainability of the supply chain as a whole. It is especially true of INPs that are more sensitive to weather conditions, such as Ximenia. If the weather negatively impacts harvest, the supply suffers and harvesters are unable to provide enough material for the international market. The international market then looks elsewhere and may not view Namibia as a reliable source of the INP. On the other hand, Commiphora has had an oversupply and Commiphora PPOs have been struggling to sell their product. This in turn deterred harvesters from continuing to harvest. Once demand increases again, there may be new harvesters who, in turn, will require additional technical support to maintain the resource base. These examples illustrate the need for supply and demand to be equally balanced - the main challenge of the INP sector today. For INPs which are in high demand, such as Ximenia, ensuring a consistent supply has proven challenging; for INPs which are in high supply, creating higher demand nationally and internationally has been difficult. Several key informants also noted that the intervention paid great emphasis to the supply side of the value chain but not to the demand side. In particular, most INPs currently go to European markets and the US and Asian markets have not been exploited to the extant possible. However, it is important to note that some work has been completed which strengthens the demand side, in particular through the Innovation Fund and research into new INP resources and the development of plant data sheets.

All key informants agreed that one of the biggest risks to sustainability is the high turnover of management teams both in terms of non-conservancy PPOs as well as conservancy based PPOs. Management staff are trained and once they gain skills they leave for higher paid and more stable jobs, often with the government, which requires training of new staff members. One key informant also indicated that at the producer level, women may marry or move from the area which again leads to brain drain. It appears that in many cases, there is no formal onboarding procedure of the new members whereby former members transmit their knowledge to new members. Fortunately, the more important management posts, such as the weighing point operator and the person in charge of monitoring the harvest, don't seem to be as susceptible to turnover although key informants had diverging opinions on that issue. Turnover in management members is a challenge that can affect the overall long-term organisational capacity of PPOs, especially once technical support and trainings end.

One key informant indicated that for Marula and Ximenia, knowledge transmission occurs at the harvester level more than the management level. There have been "training of trainers" events where harvesters learn techniques and then conduct their own trainings. For instance, at the George Mukoya PPO, management members have been training harvesters for the past two years.

In terms of sustainability, it is also important to differentiate between PPOs which are managed by conservancies, PPOs which have their own factory and PPOs which are not part of conservancies. The latter group (not part of a conservancy and or part of a factory based group) is at a significant disadvantage as they do not have existing management structures to build upon.

INP-Specific Issues

Commiphora

The Kunene PPOs appear to still be lacking basic organisational capacities. Although a number of trainings have been organised for Kunene PPOs[71], the main focus of the intervention was on the establishment of the essential oil facility (since NRI had a large stockpile of backlogged harvest). According to the key informant interviews, currently the business seems to be managed by IRDNC completely. FGDs confirm that they do not believe that they would be able to survive without external assistance.

[71] NRI training list, February 2014.

"We are not ready because the people that gave us training never gave us an opportunity to look for buyers ourselves. If they give us that training and the exposure of finding buyers […] then maybe it will go on, but the way that we are, we will just end here." [Otjiu-West management, Commiphora]

Furthermore, the essential oil of Commiphora resin does not yet have an international market. Domestically it is actually used in small amounts which would not constitute a sufficient market to match the potential production. Some of the reasons for the lack of an international market are the high price and very volatile character of the oil which makes it difficult to process and reduces its shelf life immensely. Preparations would need to contain solid waxes rather than fluids in order to retain the scent for a longer period of time, which all key informants praised for its citrus notes and tangy myrrh flavour. It is seen as a promising product due to the fact that it only grows in certain areas and can be promoted effectively using the "Himba story".

Devil's Claw

Focus group participants agreed that the commercialization of Devil's Claw is problematic. When asked what the main challenge to sustainability would be, Dzoti harvesters answered that it would be finding buyers without the assistance of IRDNC and that it would be better if local buyers could be found. As one harvester indicated *"buyers will be a big challenge because we rely much on outsiders."* There are five major exporters in Namibia who export the Devil's Claw raw material to Europe, America and Asia. According to some key informants, not all exporters are currently active. According to KIIs, one company, Ecoso Dynamics CC, seems to be the more dominant one and thus has a higher pricing power. The material can be purchased in two different ways. One is the scheme that has been implemented by the MCA-N's INP activity whereby a contract is signed between a PPO and exporters. This initial contract is typically valid for three years and defines minimum prices, quotas, management fees and the management functions from the PPO side. The model contract used by the IPs allows for annual renegotiations of prices and allows PPOs to cancel the contract if they get better prices elsewhere (this clause might in fact interfere with the long-term perspective of international buyers who need to guarantee the pharmaceutical manufacturers a continuous flow of material of constant quality). Furthermore the contractual conditions require the buyer to collect the material at regular intervals and to issue payments at fixed dates in order to provide planning certainty to harvesters and exporter.

The other way that material can be purchased in Namibia involves the spontaneous marketing of conventional material to mobile buyers, the so-called *bakkie* buyers, who pay less but pay immediately. Indeed, another risk to the sustainability of the supply chain for Devil's Claw comes from delay in payments experienced by harvesters. In some instances, harvesters may need to wait for up to three weeks after product drop-off before receiving payment. Bakkie buyers take advantage of this delay by offering to pay harvesters immediately, albeit at a much lower price. The quality of the material sold this way is

usually inferior due to long periods of storage and unstandardized harvesting and processing. But this may undermine the supply chain structure of the PPOs and is therefore a risk to its sustainability[72].

According to focus groups with harvesters, the general feeling is that their income is now steadier but has not increased much because of quota restrictions which are strictly enforced in some areas. Harvesters still sell to "*bakkie* buyers" when they are in need of instant money or in order to channel surplus material that is in excess of the quota. In general, the contracting scheme promoted by the INP activity is welcome in terms of higher selling prices but the restriction to one buyer per area is seen as an unnecessary reduction in competition that affects their negotiation power, according to FGDs.

Marula

Marula is the second most important INP in Namibia. In contrast to Devil's Claw, there were modest efforts to foster the domestic value chain at first before the project started and which are still ongoing. EWC has a well-developed business model and the export of Marula has grown in response. According to one key informant, EWC manages its supply chain almost completely independently from CRIAA; EWC even funds its own trainings on association management and quality control. The project's main focus is to safeguard a supply chain of bulk Marula oil for the international cosmetic oil market. In order to do so, emphasis has been put on the development of the EWC processing facility, and the management thereof. This processing facility as well as provision of working capital were instrumental in the success of EWC according to key informants. The organisation is still selling directly to the same international companies with the marketing help of PhytoTrade, a non-profit organization representing producers in Namibia and other Southern African countries, as before the project. PhytoTrade has been working with EWC for many years as EWC was one of the first members of PhytoTrade. In addition to Marula oil, EWC produces Marula fruit juice. Another product, a food oil, will be launched when there is sufficient raw material.

There are contractual agreements in place with more than one company for the purchase of Marula oil. However, it was not possible for Eudafano (EWC) to deliver as much as demanded. It seems that the resource is spread over a big area and partially grows in very remote areas making supply logistics difficult. This seems to be aggravated by the fact that the management is struggling with the basic organisation of the supply chain. EWC lost active members due to frustrations about rejected raw material and delayed payments but the most recent FGDs indicate that this is no longer the case as harvesters are better trained to harvest high quality Marula. This is especially true for Nkugoyepongo while Tunetu harvesters still mention long waits before getting paid. According to the focus groups, many communities complain about poorly run weighing points without scales and where the material

[72] One key informant indicated that harvesters need to decide which way they want to sell. If they sell small amounts of harvests without traveling a distance to bigger markets, they should accept lower prices. The intervention was seeking to provide harvesters with an alternative with the hope that over time harvesters organized into PPOs can have more negotiation power.

sits for long periods of time before being picked up. Although there are membership fees shared between Eudafano and their branches, it seems that the weighing point operators are not compensated for their time.

As a result, harvesters are still using traditional channels to sell Marula kernels when they are in need of instant money even though they have to accept a lower price. These problems might be related to an insufficient amount of managerial training, as mentioned in several focus groups and by IP key informants. According to KIIs with some domestic buyers, EWC is lacking the business skills to manage such an enterprise. However, these views were not supported by other key informants in the sector who view EWC as a model for other INP resources in Namibia.

However, the majority of Marula harvesting communities in the focus groups seems grateful for opportunity to improve the business. They agree that they sell to Eudafano in larger quantities and at a higher price than before the project started and that these quantities could not be sold through traditional channels. Today, many of the women see themselves in a better economic position than before the project. Nevertheless, the price per kg appears to still remain too low to attract youth to this activity, putting in jeopardy the long term sustainability of the harvest.

In terms of long-term sustainability, different PPOs voiced different opinions however. Management members from Kuupenda and Nkugoyepongo indicated that they would not be able to stand on their own without CRIAA, especially as there is no formal process for training new harvesters. In contrast, Tunetu mentioned that they do have a process for transmitting knowledge to new harvesters and that they felt the PPO could manage without CRIAA assistance.

Ximenia

For Ximenia, TTC is younger and according to two key informants needs more technical capacity. CRIAA still plays a big role in supporting Ximenia PPOs, especially as CRIAA is the buyer of Ximenia. According to the Eenhana management members[73], *"CRIAAA is our mother and father."* Eenhana harvesters believe that more associations could join TTC in the future which would lead to increased harvest. One key informant indicated that TTC would also need a working capital base, similar to what EWC received. This was reiterated in the focus groups, as one harvested mentioned that *"[they] have received trainings and knowledge, so if [they] have [their] own factory, [they] would be able to stand on [their] own."* Although TTC is currently the main Ximenia provider, this could change if consumers start looking for Ximenia elsewhere in Southern Africa. One key informant indicated that if TTC does not improve its institutional capacity, it may not be able to supply Ximenia in a consistent manner and buyers may seek other sources of supply. Key informants expressed concerns about the long term sustainability of the

[73] Note that Eenhana is the only Ximenia PPO which was part of the FGD data collection.

resource base due to reasons like climate. Climatic variation leads to an erratic supply of Ximenia which affects habitat and the economic sustainability of PPO harvesters engaged in Ximenia harvesting.

In terms of the commercialization of Ximenia oil, there are contractual agreements in place with more than one company. However, it has not been possible for TTC to meet their obligations due to harvesting issues linked to adverse weather conditions. The particular species harvested in Namibia is only found in a relatively small area covering parts of the north of Namibia and Botswana which show climatic and soil similarities. However, other areas in Africa with comparable climatic conditions have *Ximenia Americana* populations too (and *Ximenia caffra*) and are exploiting them. According to some key informants, the resource base of Ximenia may be endangered and thus threatening the sustainability of the economic enterprise. According to harvesters, Ximenia is traded through channels other than TTC although the price at which it is traded as well as the reasons why it is traded through these other channels are unclear.

When it comes to post-extraction processing, the oil of Ximenia is more challenging to process than Marula oil due to a slightly sticky texture. According to key informants, this argument is used by importers as a way to pay a slightly lower price for the crude oil, although it has not been the case recently due to the shortage of supply. On the other hand the preparation and pressing of Ximenia is easier and therefore favourable to the cost structure. There is almost no marketing of Ximenia oil in the domestic market. In terms of sales in the domestic market, the key informant interviews indicated that the domestic private sector is aware of the product and of its oil prices, but that they do not sell Ximenia currently.

In summary, prices per kg, adjusted for inflation, appear to have remained relatively stagnant with the exception of Marula as Marula harvesters have reported selling more and at better prices. In terms of the market chain, Devil's Claw seems to be the only resource with a functioning market chain as contracts with buyers have meant a more predictable source of income for harvesters. For Marula and Ximenia, while contracts are theoretically in place, the harvest has not been able to meet the demand of buyers. For Marula, this seems to be due to difficulties in harvesting the resource in very remote areas and loss of active members due to frustrations about delayed payments and rejected raw material although this may have decreased recently, as well as the amount of labour available to decorticate and extract the kernels. For Ximenia, as mentioned earlier, adverse climatic conditions have been preventing the harvest of the resource. As for Commiphora, the international market is not developed and the domestic market is relatively small.

5. Key Take-Aways and Limitations of the Evaluation

Application of training. Of the households that participated in training, almost 100% said they applied what they learned. The qualitative data confirmed that the majority of harvesters found the trainings useful and applied what they learned in trainings.

Determinants of training take-up. While female-headed households were less likely to attend training at baseline, this correlation vanished at endline, suggesting that eventually there was no gender bias in training take-up. On the other hand, there is a positive correlation between education level and training participation, which may have implications in terms of inequality, as abler individuals may have been the ones that benefited the most from training.

Effect of training on harvested quantities. We find a positive and significant effect of training only for Marula. We did not find significant effects of training on harvested quantities for Devil's Claw or Ximenia. The null effect found for Ximenia may be a consequence of the drought observed in 2013. Although any change that affected all the harvesters is controlled in our specification through year fixed effects, any shock devastating enough will impede any program to have an effect, even if such a program would had a positive effect in the absence of the shock.

Effect of training on INP quality. FGD participants strongly indicated that the trainings had an effect on the quality of INPs. It improved the harvesting practices for Devil's Claw and Marula. Trainings also increased the quality of post-harvesting practices.

Effect of training on revenue and other financial constructs. Not surprisingly, we found positive effects of training on INP-related revenue only for Marula. Although the coefficients were positive for household total revenue and income (for Marula), the standard errors were large and no significant effect was found for these variables. For Devil's Claw and Ximenia we did not find any effects. The perception from FGD participants is that the trainings contributed to increase their income.

Gender. As Marula harvesters are females and there was an effect of training on Marula, it was to be expected that training affected positively the revenue of females for Marula households, which was corroborated by the data analysis. Qualitative data suggest that trainings have had an effect on women as they became more empowered and their role as income earners elevated their status in the household. However, there is also a sense that despite this, men still remain the heads of households and decide what to do with the money.

Market Bulletin. The original market informational tool was ill-conceived and replaced with a market bulletin. Key informants felt that the market bulletin did not have a strong impact on the sector and it will likely disappear after the end of the Compact.

IPTT. The IPTT is seen as an important platform and the re-organization that it underwent during the Compact duration was welcome. However, the future of the IPTT is not yet clear, so a vision for the IPP in years to come needs to be well-defined.

Innovation Fund. The innovation fund funded some promising projects but unfortunately there was not enough time to implement many of the results that came out of the projects.

Sustainability of the sector. Many PPOs are still dependent on implementing entity support and will need continuous training especially due to management staff turnover. Overall there is also a sense that the project did not focus sufficiently on the demand side of the supply chain and that is a threat to the sustainability of the INP sector as a whole.

There are important limitations that need to be taken into account before extracting any final conclusions from this study. In what follows a description of what these are, their possible implications for the analysis and our strategies to deal with them are described

Quantitative sample: It is important to keep in mind that the quantitative sample is not representative of all PPOs that were included in the INP Activity. The household survey sample was drawn from a sample frame comprised of 2009 PPO membership lists and only 18 PPOs figure in the household panel, out of more than 60 PPOs that benefitted from the intervention. Therefore the quantitative results presented in this report are only applicable to the 18 PPOs represented in the sample.

Counting training sessions: Our covariate of interest is number of training sessions in the twelve months before data collection at baseline and endline. This implies that trainings that occurred between mid-2011 and mid-2013 are not counted. This constitutes a measurement error problem that may be biasing our results. This is particularly problematic if we consider the possibility that, as it was our understating before analyzing the endline data, all or most households participated in training at some point. However, our variable for treatment constitutes a good proxy (although, perhaps, deflated) for the actual number of trainings if the households that participated in more training sessions 12 months before data collection, were also more likely to participate in training between mid-2011 and mid-2013. The fact that we found a positive correlation between current and previous treatment, suggests this is the case.

Selection into treatment: Selection into training sessions was driven by a joint selection process. On one hand treatment was provided and on the other households members participated. This implies that selection into treatment was determined by many factors, which could also be correlated with the outcomes of interest. This could bias the causal effect of training. Our identification strategy relied on the use of household fixed effects and propensity scores. The assumptions needed for these strategies to work as intended are that the characteristics they may confound the treatment effect are either time-invariant, or are observed (and included in the propensity scores).

Attrition: A small fraction of households surveyed at baseline were not surveyed at endline. This constitutes an attrition problem that may be biasing our results. Although the data suggested that there were some differences between households that stayed in the sample and households that didn't, assuming that this selection process was driven by time invariant characteristics, attrition is controlled for in our household fixed effects models.

Qualitative Sample: It is important to keep in mind that the FGDs only covered 12 PPOs at midline of which 8 were re-selected for the endline. For Ximenia, only one PPO was interviewed. It may therefore be difficult to generalize the qualitative findings to the entire INP harvester population.

ANNEX A – WEIGHTS CALCULATION

Harvester Sampling Weights for Baseline and Endline by INP

Stratum name (INP Species)	Harvesters in population	Baseline			Endline		
		Harvesters selected for sample	Actual sample size*	Sample weights	Additional HHs	Row total	Sample weights
Commiphora	367	63	0	n.a.	63	63	5.825
Devil's Claw	882	150	62	14.226	91	153	5.765
Marula	1,763	175	166	10.621	7	173	10.191
Mopane	224	42	0	n.a.	42	42	5.333
Ximenia	407	70	70	5.814	1	71	5.732
Totals	3,643	500	298		204	502	

* Total realized sample size (responding and replacements).

The baseline sample is constructed from 18 PPOs out of approximately 63 that were operational and had member lists in 2009. The number of households selected was established by MCA-N prior to NORC's participation. Harvesters were randomly selected from a sampling frame comprising of the PPO member lists of the subset of PPOs specializing in the respective INP. With this in mind each weight is calculated as the reciprocal of the probability of selection. This requires dividing the population size in each row by the row's actual baseline or endline sample size (Column 4 or Column 7, respectively).

The use of these weights depends on whether one is conducting panel analysis or cross-sectional comparisons. For panel analysis the baseline weights is applied to both rounds. For comparison of discrete cross-sections, the baseline and endline weights in the table is applied accordingly. The reason for this difference is that the latter includes additional observations randomly sampled from the same population so the larger sample implies that each observation.

Conservancy Household Sampling Weights for Baseline and Endline

For the sampling plan, NORC generated 90 site-specific sampling weights for about 1,000 households – that is, on average about twelve households receive the same weight. A complex process was used and involved a technique called variable stratification. The CS survey was a two-stage sample in which the first-stage sample units (primary sample units, or PSUs) were portions of Census Enumeration Areas (EAs) and the second-stage sample units (elements, ultimate sample units) were households. The first-stage sample units (EA portions) were selected with variable probabilities, to assure adequate variation in explanatory variables related to outcomes of interest. The second-stage sample was a random sample of households selected from each first-stage sample unit. The intended household sample size within each PSU was 12, but this varied a little, because of inability to obtain this number of sample households in a PSU, or to obtain replacement households for PSUs falling short of this target number.

An “unnormalized” sample weight is obtained for each PSU by dividing the total number of households in each sample PSU by the product of the PSU selection probability times the number of sample households in the PSU. The term “unnormalized” is used because of sampling variability. A “normalized” per-household weight is obtained by normalizing the resulting values such that the total weight for all sample households equals the total number of households in the population.

Since the endline replacement households were “near” to the original household, the sampling weight from any lost household was also applied to the household that replaced it.

ANNEX B – OUTCOME MEASURES, DATA SOURCES, AND YEARS AVAILABLE FOR CS ANALYSIS

The evaluation design report included a list of data items to be included in the analysis after consultation with CDSS at baseline. Since then, however, we learned that not all of these data are available, or are not available consistently for baseline and endline. They are listed in the table below.

Table 58: Availability of Data Items Listed in EDR

No.	Data Item	Availability from Implementer Databases?
1	Number and year-to-year change in the number of business partnerships between conservancies and private businesses by conservancy, showing JVs versus others	Number of JVs operational from 2010-2014 Number of SMEs operational from 2010-2014
2	Amount (N$) of private investment secured per year by MCA-N-assisted conservancies by conservancy	One-time investment figure available
3	Investment secured per year from different sources by conservancy by year	CDSS states that quality of data on investment in non-MCA-N co-funded enterprises is poor.
4	Annual gross revenue[74] of conservancy by conservancy by year	Available from 2010-2012
5	Conservancy income by source (JV, forest products…) by year	Only available for 2011 and 2012 in CONINFO database
6	Actual conservancy payments in cash and some in-kind benefits distribution	From CDSS Annual Report: only broken out by cash+in-kind and meat from 2010-2012. From CONINFO database: broken out by cash, social, and other benefits. Only available from 2011-2012. Does not reconcile with CDSS Annual Report.
7	Household cash dividends by conservancy by year (total amount)	From CONINFO database: broken out by cash, social, and other benefits. Only available from 2011-2012. Does not reconcile with CDSS Annual Report.
8	Share of conservancy revenue paid out in dividends or spent on community services by conservancy by year (and distribution of all spending per year)	From CDSS Annual Report from 2010-2012.
9	Number of conservancy-related jobs created by conservancy by year	CDSS-C
10	Number of conservancy-related jobs by job level by conservancy by year	Not available from CDSS or NACSO
11	# annual visitors to conservancy by year[e]	Not available from CDSS or NACSO
12	# of visitors in the baseline year by conservancy/# of paid bed nights	Not available from CDSS or NACSO
15	Conservancy located on newly developed tourist route	MCA-N Tourism Project[h]
17	# game animals translocated each year to each conservancy	Available from MCA-N and CONINFO[g]

[74] Annual gross revenue is defined by CDSS as revenue to conservancies receiving MCA-N assistance from all sources except donors, INPs and government. Includes revenue to conservancies from cash, household income from conservancy-related wages, salary, or sale of crafts, and non-financial income such as meat or in-kind services, including trainings or housing for lodge staff

No.	Data Item	Availability from Implementer Databases?
18	# rare game animals translocated each year to each conservancy	Available MCA-N and CONINFO[g]
19	Year conservancy created	Available from CONINFO
20	Other (non MCA-N) support to each conservancy each year by type, e.g., TA, training, grants	Not available from CDSS or NACSO
21	Quality of conservancy governance (14 indicators, overall score) by conservancy at baseline and endline	2013 CDSS Annual Report 2010-2014 CDSS Governance Indicators
22	AGM held by conservancy by conservancy by year	2013 CDSS Annual Report 2010-2014 CDSS Governance Indicators
23	At AGM: report made on prior year's spending; plan for next year's spending presented; and distribution of net revenues discussed with members	2010-2014 CDSS Governance Indicators; data quality and coverage across conservancies not sufficient for analysis
24	Pct of all members attending AGM each year	2010-2014 CDSS Governance Indicators; data quality and coverage across conservancies not sufficient for analysis
25	Conservancy has a sustainability or business plan in place	CONINFO database
26	Business plan/sustainability plan exists	CONINFO database
28	Conservancy has a tourism plan prioritizing opportunities[(m)]	Not available from CDSS or NACSO
29	# of grants & value to each conservancy by year for JV and each other grant purpose from CDSGF	MCA-N CDSGF database
30	Accessibility indicators	Not available from CDSS or CONINFO
31	Training by type of training by conservancy by year	Available from CDSS from 2010-2013
32	Technical assistance received by type of assistance by conservancy by year	Days of TA, available from CDSS from 2010-2013
33	Rating of results of training by conservancy by year (based on student assessments)	Not available from CDSS
34	Conservancy expenditures by category by conservancy by year	Available from CONINFO database, for 2011-2012
35	Percent of conservancy's operating costs covered by own income	Not available
36	Ratings in Annual Natural Resource Management Assessment Tool	Available from CONINFO database
37	Conservancy population, most recently available data	Several measures available from CONINFO/State of Conservancy report—however, numbers are not consistent.
38	Number of conservancy members	Several measures available from CONINFO/State of Conservancy report—however, numbers are not consistent (e.g. some membership numbers exceed population numbers)
39	Conservancy land area	Available from CONINFO data-

No.	Data Item	Availability from Implementer Databases?
		base
40	Turnover of Management Committee members by conservancy by year	Not available from CDSS or NACSO
41	Turnover of conservancy staff by conservancy by year	Not available from CDSS or NACSO
42	Number of new SMEs by sector by conservancy per year	2010-2013 CDSS Governance Indicators
43	Annual revenue of SMEs by conservancy by year	CONINFO database, 2011-2012

The following tables indicate the data sources for the indicators used in the analysis.

Table 59: Benefits Measures by Data Source

Variable	Data Source	Years available
Total distributed (as reported by conservancy) Meat Value (as reported by conservancy) Cash and In-Kind Value (as reported by conservancy)	2013 CDSS Annual Report	2010-2012
Cash Value (as reported by household). Includes: - Compensation for HWC - School Fees - Loans - Cash paid directly In-Kind Value (as reported by household). Includes : - Food (such as game meat) - Fuel - Transportation - Support for funerals and ceremonies - Non-game natural resources	CS/INP House-hold Survey	2010-2011 2013-2014

Table 60: Governance Indicators by Data Source

Governance Indicator	Data Source	Years Available
CDSS rating of governance	CDSS 2013 Annual Report CDSS Governance Data	2010-2012 2010-2013
CDSS rating of financial performance (subset of governance rating)	CDSS 2013 Annual Report CDSS Governance Data	2010-2013
CDSS rating of AGM performance (subset of governance rating)	CDSS 2013 Annual Report CDSS Governance Data	2010-2013
% of households that participated in AGM	CS/INP Household Survey	2010-2011 2013-2014
ARD Baseline score: democratic governance ARD Baseline score: financial performance ARD Baseline score: benefit distribution planning and execution	ARD Management Capacity Reports	2009

Table 61: Household Income and Expenditures by Data Source

Variable	Data Source	Dates of Availability
Household Income, including: - INP income - Income from crop cultivation - Income from animals and animal byproducts - Income from employment (conservancy and non-conservancy) - Cash from conservancy (benefits) - Non labor income	CS/INP Household Survey	2010-2011 2013-2014
Household Expenditure, including: - Expenditures related to INP harvesting - Expenditures related to crop cultivation - Expenditures related to the purchase and maintenance of animals - Other expenditures	CS/INP Household Survey	2010-2011 2013-2014

Comments and Response Trail – Evaluation Report (Final)

October 2014

#	Comment text	Response
1	Please proofread this report; there are typos and grammatical errors throughout. The report could also be tightened up, with some of the repetition addressed. for example, the research questions are repeated three times before page 15.	Changes have been made.
2	Any picture on front page?	No
3	This executive summary is lacking a description of the interventions, summary of implementation, and summary of results.	Included
4	Okay, but more detail about the intervention people received (e.g., the type and extent of trainings), compared to what was planned, along with the cost of the interventions, is useful context for the results reported. Without this, the report is difficult for someone unfamiliar with the interventions to follow.	More details around the intervention have been added to the Activity Overview section of the CS report.
5	In practice these approaches seem very separate, rather than explicitly confirming whether qualitative "results" bear out in the data and providing context from the qualitative material when presenting quantitative results.	This has been better integrated throughout the discussion of findings in the report, as well as by adding a discussion section for parts of the report that incorporate both qualitative and quantitative work.
6	The report would benefit from more "bottom line" discussion after the detailed findings. That exists for some research questions but many others seem to lack this. A Key takeaways and a discussion of policy implications is requested for each evaluation. If the results are a mixed bag or inconclusive, it would be useful to hear NORC's assessment of that.	Further discussion/key takeaways added to each evaluation question.
7	The sentence in the executive summary related to this could be better worded to avoid confusion.	Ok
8	Maybe some impacts are qualitative but definitely not all.	Edited
9	This stuff is all very repetitive as it was always mentioned in the Executive Summary and Introduction. Please limit the amount of repetition and be sure that information being presented in each section is new and relevant.	Edited. Keep in mind that the executive summary is supposed to contain the information found in the body of the report but in summarized form.
10	Do the necessary conditions seem to be in place for these effects to bear out in the longer term. Please consider this particularly in light of sustainability questions? If so, when might they be expected? And what was the benefit of evaluating before full benefits were expected?	Sustainability is addressed at length in Section 4.8 (RQ6) for CS. The timeline for the evaluation was determined by MCA-N. However, while the evaluation examines those overall outcomes, such as household well-being, it also captures the relationship between MCA-N interventions and a number of intermediate outcomes.
11	Is there any reason to believe results would be different for them?	Added clarification to text.

#	Comment text	Response
12	How many received grants?	Added clarification to text: A total of 15 conservancies received grants.
13	Please add details on the TA and training modules and how they were offered? For example, could conservancies request them? Did WWF decide who got what, or did regional implementers have some say? What kind of variation was there in the way regional implementers implrmented the program? Were there varying "tracks" for the same subject? For instance, we know that "promising" conservancies may have received certain types of support specifically because they were considered to have potential. Is is possible that lagging conservancies were also offered the same kinds of trainings (maybe just at a different level)?	Added explanation and discussion to text
14	Sure, it's conceivable, but is this assertion based on anything in particular?	Other studies suggest that one to two years is too short a time period for the very small changes anticipated in income growth to have a detectable effect.
15	Arguably, translocations are a part of FAT, rather than an outcome.	Correct. Good catch-- diagram has been modified.
16	Please add details on how you decided which conservancies to revisit?	Footnote added
17	What did this entail?	Added clarification to text: CDSS often uses financials and other documentation to verify information solicited from conservancies and regional partners. In this verification process, CDSS uses its local knowledge to assess the reasonableness of each data point, follows up with regional partners and conservancies themselves to confirm numbers, or verifies this information during their own field visits to the conservancies. Throughout the evaluation period, CDSS updated numbers as they received new information.
18	Does this reflect a change from pre-intervention?	Context and it is not specified
19	Does this reflect a change from pre-intervention?	Context and it is not specified
20	Do we know whether the change in amount reflects an increase in equity and not something else, like increased revenue to the conservancy?	Yes, revenues distributed have increased very substantially, but the direct quote is, "*They were just not always distributed that well. Now they are distributed more equally."* This is very explicit. Maybe they mean something else, but this is what they said, at least as translated.
21	Unclear what this is responding to or means on its own.	This sentence had mistakenly been separated from the rest of the quote in the following paragraph.
22	Is it clear to the evaluator why this is? I couldn't tell from the quote that follows.	Interpretation is spelled out, but still making it clear that it is evaluator's interpretation.
23	Unclear whether this is actually a reference to deciding how to spend cash or deciding as a community what public goods to invest in.	This refers to the community, clarification has been inserted this in parentheses
24	Do any of the data the evaluator has help sort out what might explain the differnces in the box at right?	This is explored in RQ2. Unfortunately, we don't ask that many opinion questions in the survey about the level of governance as perceived by respondents, with the exception of benefits, which we describe in the quantitative section of RQ2, to compare against the governance scores put together by CDSS.

#	Comment text	Response
25	And this is unchanged since Compact started?	The FGD shows that this is the current situation. It does not indicate how long it has been this way. A statement has been added to this effect.
26	Is this the only one?	It is the only non-management FGD whose members were overwhelmingly positive about governance.
27	Is this according to the members or NORC?	This has been clarified.
28	Are these averages conditional on getting a certain type of benefit? Do we know the statistical significance of the differences? Please include data sources for all tables. If this is based on the HH survey, can NORC briefly describe how you valued in-kind benefits?	These points were addressed in the draft submitted Sept 15. As explained in the footnote, average per household is the average benefit received across all households that received that type of benefit. It only counts households that received the particular benefit. Data source now included underneath the chart.
29	What does NORC make of the distribution of these responses?	Added explanation to text.
30	Similar to the comment above, what are these actually measuring?	Comment already addressed in draft submitted Sept 15.
31	Really, even if the Gini changes from from 0.036 (very equal) in Sheya Shuushona to 0.74 (more unequal) in Omatendeka? This cant be the result of training only, but rather a case of insufficuient data collection or errors within the data? Please investigate. Note that the variation in income fluctuated the most between baseline and endline in Sheya Shuushona!!!	(a) Training is not the only explanatory variable here so there was no implication that training was responsible for the variation in the Gini Coefficient across conservancies. All that is said is that, in addition to governance variables, when training variables were added the governance explanatory variable *still* had a positive sign. We agree that the data are problematic and, in fact, the sampling design was based on statistical significance at the level of the population, not at the individual conservancy. Still, the Gini Coefficients are highly averaged parameters (i.e., based on many observations) so there would have to be a substantial systematic bias from somewhere *across all* conservancy reporting for the governance coefficient to consistently have an incorrect sign across several specifications. (b) Note that the figures have been updated.
32	Based on years, seasons or interventions???	Lagged by 1 year (t-1)
33	Can NORC summarize how the qualitative and the quantitative analysis come together? Across the board, please include such discussion for each question, and then another for the overall evaluations.	Discussions have been included for each qualitative + quantitative question to better synthesize findings across both types of analysis. For questions that are solely qualitative, the discussion of findings is integrated into the qualitative analysis.

#	Comment text	Response
34	By omitting any discussion of what was implemented (compared to what was planned), this evaluation does not address the status of the JV grants. It has become clear that construction of many of these JVs has not completed. Accordingly, the results presented here likely are not reflective of the types of jobs anticipated for the grants—but rather, these are probably construction jobs. Can NORC verify this understanding and assess how, if at all, that influences your interpretation of the data?	CDSS's full-time employment figure "excludes the approximately 129 short-term jobs created in building new joint venture lodges[1]." I don't see why we should evaluate what was planned. Our job was to attribute any impacts discovered.
35	How are full-time and part-time defined?	CDSS acknowledges that "it is difficult to define what constitutes a casual job and how long they last for[2]". CDSS also uses full-time interchangeably with "permanent" employment, and part-time with "temporary" or "casual" employment. These definitions are outlined in the first paragraph of the Quantitative findings portion of RQ3.
36	Please distinguish between notes and indications of statistical significance. This is an issue in other tables too.	Changed stars to superscript letters
37	This is a cause of concern that all these OLS resulted in such small variation of R^2. Normally there is more variation. Please explain	I have never seen such a concern raised. It wouldn't seem relevant. Nonetheless, what seems to be the case is that most of the variation is being captured by ARD_HK and Population. These two variables are in all the regressions so the R^2 values are similar.
38	In summary?	Discussion of results (synthesized with qualitative findings where appropriate) have been added.
39	Given the question, why the focus only on governance? Is that the only (or primary?) program component that would have influenced the distribution of benefits?	Addressed in first paragraph of analytic approach: An increase the "pie" of benefits available for distribution is linked to conservancy income (and sources of conservancy income). However, an increase in the equitable distribution of benefits is linked to increase governance—in particular, greater transparency in management committee decisions, greater democratic representation, and better financial management capabilities. The focus of the analysis is on improved governance across these three categories.
40	For context, perhaps NORC could mention that redistribution can come at the expense of male-headed households—if there isn't a larger "pie" to distribute.	Added in.
41	Defined how?	The governance indicator is a straight average of ratings of AGM compliance, benefits distribution, constitution, breakdown of gender in the management committee, and financial performance.
42	This implies that you could use all of the data observations, and none had any errors resulting not to be used?	This analysis was run over several years (baseline and endline).

[1] CDSS Final Report, 2014. page 25.
[2] *ibid*

#	Comment text	Response
43	Does the evaluator have any idea what aspect of the trainings might have that effect, especially as the trainings were geared at concervancy leaders not the average member?	No, the FGD do no shed any light on this. I believe that some of the trainings were directed at members and not at managers but I haven't seen any details on this.
44	It was unclear whether this "conservancy program" refers to the Compact interventions or the conservancy movement in general. If the latter, this does not address the research question.	They can be used interchangeably in this instance
45	Since the Compact started?	The key informant did not specify. But it seems clear that if the number was already growing before the Compact, it has also continued to grow since the Compact began.
46	Defined how?	Meaning has been clarified
47	Please mention that employment of conservancy members was a specific "term" of these grants.	Ok
48	Can NORC synthesize anything from the discussions of benefits?	Synthesis has been added in "discussion of key findings" section.
49	Even without outliers, the change in a number of means and assets seems really odd, whereas the expenditures seem much more stable. Evaluator have any ideas about some of the extremely large increases? How many of these differences are statistically significant?	Outliers were cleaned and excluded—however, some large increase in assets still exist. Unfortunately, time was not available to delve deeper into the issue.
50	No regional differences? especially since we know that cultural differences occur, that agro ecological differences occur and that tourism potential differs across regions.	The sampling design was not done to support conservancy-level hypothesis testing. In any event, we did use regional dummies is several regressions.
51	Please describe why NORC answers a question about the relationship between the CS program, including grants, and household wellbeing, with an analysis between HH benefits and wellbeing—this is particularly curious given the decrease in benefits associated with increased training. Also, are we not able to quantify the extent to which the CS intervention is associated with an increase in wellbeing?	The answer requires an appreciation of the theory of change, as shown at the beginning of the section (Figure 11). As is illustrated, the impact of all technical assistance is through employment and benefits. The assistance-employment and assistance-benefits links are analyzed above so here we only need to look at the next link, namely, benefits-income.
52	This is counterintuitive. Does NORC have any ideas why this is?	Results have since been modified.
53	Because people hunted it before it stabilized?	No explanation for this was given. This statement has been added.

#	Comment text	Response
54	Was management of this business a part of the CDSS trainings, e.g. skills to do good game counts and protect animals?	Question is not clear. CDSS did not provide training for the hunter's business. The hunter is speaking about the potential for increasing conservancy-based safari hunting in general. He has had partnerships with 11 different conservancies. He was extremely negative about the Ministry's and the conservancies' roles in game counts and quota setting. He was one of the first people interviewed and he made some statements that I triangulated with several other people – statements that did not hold up, so I did not emphasize his negative statements in the report.
55	Quota discussion is unclear; please describe who sets this and how it is enforced.	This paragraph has been rewritten to make this much clearer
56	Does NORC have any sense of the extent of this problem?	This has been clarified.
57	Were elephants translocated?	Deleted
58	Is this point specific to quantitative analysis? Also, did translocations continue from other sources during this period?	We don't have access to information on other translocations.
59	Was this an explicit part of the training? (Again, a better sense for what trainings were offered and intended skill gains would be a useful addition.)	This has been addressed in the sixth paragraph of Section 4.8 where the impact of training on capacity to manage and sustain JV partnerships is analyzed.
60	Agreed that this represents potential but as referenced above, it seems this component is quite a bit behind schedule and it's unclear now how we will learn about the completion of works and outcomes expected to follow. This important context for the success story of the grants is missing here.	We didn't say it has potential but that it is the key strength of the grants program.
61	I don't think anyone can "own" land in the northern communal areas so might need to reference possession of land rights instead.	The only point that is important is that foreign investors cannot own land. I have modified the text.
62	As evidenced how? How many JVs is this true for?	Grants were excluded from specific quantitative analysis due to their low number. This is because before estimating an attribution equation we'd need to estimate a selection equation to determine why a conservancy received a grant. Again this requires more observations than we had.
63	And animal stocks are maintained?	Yes, this has been made explicit
64	Because they weren't designed for that?	That was his meaning, but he was not explicit on this point.
65	It isn't clear what this means; please explain the importance or role of this integration.	Clarifications have been added
66	Value to whom?	Edited
67	Not new	Edited
68	harvesters or producers? Please be consistent.	Edited throughout

#	Comment text	Response
69	Shouldn't this be referred to as a oligopoly instead of a monopsony. Monopsony consists of a single entity's control of a market to purchase a good or service, and oligopoly consists of a few entities dominating an industry.	Edited
70	This is a confusing sentence please reword. Who sets the minimum price, PPOs or the exporter-buyer?	Edited
71	Not clear	Deleted
72	What is meant by "they"?	Deleted
73	Not accurate	Please elaborate why this is not accurate. This was information given to us from KII and is confirmed by the INP Market bulletin (e.g. July 2012 issue: "Negotiations with an international buyer during 2011 have not yet translated into any sales. The decision was made that no further harvesting of "the perfume plant" resin will take place until a firm order from a buyer has been received. No exports were recorded for in 2011/2012, and no harvesting of the resource took place. The Opuwo Processing Facility continues to process stock-piled commiphora resin for national and regional sales.")
74	Please clarify what this footnote is referring to.	The footnote clarifies the source of this information (the source being an MCA-N reviewer).
75	Please state what the Government of Namibia recog-nized as the "potential threat" in the text.	Edited
76	Northern and eastern areas of what?	Edited
77	Seems high, but is well with the realm of possible.	Ok
78	What does the denominator represent here? Annum? If so why write out per annum in the sentence?	Edited
79	I think this was oil. about 50t of kernnels	Corrected
80	Is ALDIVIA an acronym? If so, please add to the acro-nmym list. If not, please provide a description of what ALDIVIA is either in the text or as a footnote.	Edited
81	Isn't this a part of the technical improvements men-tioned in the previous point? Project documents indi-cate that the fourth area of focus is establishing a basis to attain organic and fair-trade certificatin for INPs.	The technical improvements mentioned in 3 are related to processing while this bullet point refers to harvest-ing. Added organic/fair-trade certification.
82	Please indicate which area each one is responsible for.	Added
83	What does this mean and where is this "objective" documented?	This means that the program attempts to open access to vulnerable populations in a benefit sharing approach which means that the more a PPO harvests the more the individual people benefit. This is documented in the NRI inception report in several places as well as the MCA-N M&E plan.
84	Logically, shouldn't the presentation of the INP Activity (and it's three sub-activities come before detailed discussion about the goal of one of the sub-activities (i.e. the previous PPO sub-activity discussion).	Corrected
85	Please describe what kind of processing is done at EWC. And add EWC to the acronym list.	Acronym included. Processing for Marula includes pressing and cleaning the oil and then packaging.

#	Comment text	Response
86	I'm not sure how this is relevant to a discussion headed "INP Activity Program Logic". Wouldn't this text be better positioned in the Methodology section of the report?	It fits under program logic in the sense that we discuss longer vs medium term outcomes and what these might be.
87	Please specifically mention what is meant by INP and PPO related practices and techniques.	Added
88	Write ou in full.	Edited
89	Can NORC describe the TA vs. the training and how the former might have had more impact than the latter?	TA is similar to training but on more of an individual basis and focused on the specific needs of participants. TA can happen multiple times and reinforce things learned in training. If there is more TA then it means the impact is greater (as perceived by respondents) because they directly apply what they are learning with direct oversight and input from implementers.
90	?	Deleted
91	Unclear whether this applies to INPs specifically?	Some PPOs are part of conservancies and so PPO-level trainings were given by CDSS rather than NRI. In this case there is an overlap between CS and INP activities.
92	Not correct, it has nothing to do with tube size	Deleted
93	This comment is already in a text box, no need to repeat. Either put in a box or in parentheses with italicized text, not both.	Ok
94	What statemnt is this quote supporting? Certainly not the previous sentence which leaves one with the thought that trainings did not help PPO management. Text needs to be re-worked as it leaves the reader confused.	The previous sentence is this: "Some focus group participants from management staff of PPOs, however, did seem to think that the trainings helped in terms of management." So this sentence clearly says that some participants think that the trainings DID help. Otherwise, please clarify the comment.
95	This sentence is confusing. Please reword.	Reworded
96	Same as previous comment about text box and then repeatred quote in the body of the text. Please use one or the other, not both.	Ok
97	Any information on how long the PPO had the machine and why it hadn't been used?	Unfortunately we do not have this information
98	Is this intended to be a comparison?	Edited
99	Not CRIAA because they don't operate in that area but rather IRDNC	Corrected
100	See previous comment about text boxes.	Edited
101	Please describe the trainings somewhere: what was covered within the two broad categories? For how long? All types of training created equal and offered to everyone? Is attendance generally good throughout? Is attendance required for any other part of the program, e.g., to receive equipment?	Unfortunately we do not have this information
102	Defined how?	Definition added at the beginning of the section
103	Please provide this "bottom line" throughout!	Ok
104	Just from an equity perspective?	We don't understand this question

#	Comment text	Response
105	The quantitative analysis seems disconnected from the research question, which asks about the effect of the program on participants.	Indeed this is not about the effect of the program, but about the determinants of participation, an analysis performed in most evaluations. This has been moved to section 4.2 where more relevant.
106	Is this substantiated by implementer records? And do we know whether INP training had been offered to all implementers by the time of the baseline data collection?	Training had not been offered o all PPOs by the time of baseline data collection.
107	PPIGs? If so, there wasn't much in the text section of each of the INPs about PPIGs. Could a few sentences be added regarding the PPIGs and the effect associated with them?	There is a section on effect of PPIGs
108	What does this mean? It would be good to provide an estimate of the quantity of Commiphora currently being processed and then say something about what the ideal amount would be.	Unfortunately we do not have this information. NRI should be able to provide detailed information on the processing plant to MCA.
109	What is the production capacity of the facility? Any chance of the PPO eventual producing more there?	Unfortunately we were not provided information on the production capacity of the current facility
110	Can the evaluator say anything about the volume of INPs from participating PPOs that contributes to total exports?	Unfortunately we do not have this information.
111	According to FGD? KIIs? PPO records?	Edited
112	Does this a stand for annum? If so, it might be better to simply write the words per annum or show that a = annum somewhere.	Edited
113	Add detail on how many applied, how many received? Check CDSS report	Added
114	Please note that because of the ban of Devil's claw by MET, all the Zambezi region PPO were trained but harvesting was delayed due the ban. When the ban was lifted, PPO decided not to harvest in 2013 because it was too late for harvesting.	Ok
115	Can this be worded better?	Reworded
116	There is a need for some sort of concluding paragraph here that summarizes all the individual INP findings up in a tidy paragraph easily understandable by a layperson.	A paragraph was included summarizing the main results
117	Only for devil's claw.	Edited
118	But over a period of about 8 months.	Do harvested harvest for the entire period?
119	Please reword as I am not sure what is trying to be communicated in this sentence.	Edited
120	Again, I'm not sure what is trying to be communicated here. Any revenue (gross income) can be used to build assets.	Edited
121	Does this bear out in the survey data?	Added a footnote comparing with survey data.
122	Incorrect, this has always been N$50	This was information from three different non-management harvesters from Puros. Edited.
123	Does NORC understand what explains the increases in prices across the board?	Clarified.

#	Comment text	Response
124	Dzoti was not harvesting DC before MCA-N	Added footnote
125	For a period of 8 months	See above
126	This was never the intention of this activity.	Ok
127	This needs to be worded better. If KIIs and FGDs are saying that there is an improvement in their financial situation (i.e. household income level – see highlighted sections) than this needs to be clearly stated. Regarding composition (Savings, debt, borrowing and insurance) of household income….I didn't see a lot of discussion. If it is there it isn't clearly referenced so it is hard to see what the qualitative conclusion are regarding this part of the research question.	Deleted this paragraph as it is not directly related to the research question which is more focused on hh income.
128	Please provide a concluding remark that explains what all this means and is understandable to a layperson. Please interpret the result and talk about the magnitude	We reworded the paragraph so its clearer, discussed the magnitude of the one parameter of interest we can estimate with precision in this table in the previous paragraph, and summarize the results at the end of the section
129	By how much?	We included this in a previous paragraph
130	Can you note what is and isn't significant? How does this situation differ from baseline?	To produce significance levels we present average number of household members in each activity instead of the ratios we had before, by gender of the household head and by baseline and endline (we could calculate standard errors for ratios too, but then it won't be clear what changed, the numerator or the denominator or both).
131	I thought training was already discussed. Isn't this section about changes in intra-household incomes and assets, including specifically around income earned by male and female household members? Does the intra-household distribution of income and employment by male and female household members change?	We present summary statistics for female INP revenue in levels and as a share of total INP revenue for baseline and endline and by INP. As changes over time can be attributed to many different things other than the intervention, we left the analysis that looks at the effect of training on female INP revenue, but we can drop it.
132	There needs to be more discussion here on potential reasons why this occurred.	We cannot speculate further at this point
133	Really? Never is pretty strong word, perhaps it would be more appropriate to say unlikely to be involved.	Deleted sentence as not directly related to household gender relationships
134	Is this correct? I thought head of household was usually a man. Is that what data from Population census of Namibia saying?	Deleted sentence as not directly related to household gender relationships
135	No quantitative discussion?	No (please look at table of research questions presented at beginning of report that lists methods (qual, quant or both) to be used for each research question
136	Meaning that in other words, harvesting INPs might not be worth the effort?	This is dependent on the INP and time use associated with each one. Unfortunately a time use analysis was beyond the scope of our current evaluation
137	These are interesting points. It might be good to elaborate further on this if possible.	Elaborated further

#	Comment text	Response
138	The supply chain was already there before the Visitor Center was build.	Modified slightly
139	Isn't that the way INPs work for non-PPO members? Not clear what benefit of PPO membership is for INP harvesting then?	Being part of a conservancy is the same as being part of a PPO when the conservancy acts as a proxy for PPO. I'm not sure I understand the question.
140	Again, very interesting points.	Elaborated further
141	Please state what this means in language a layman would understand.	Elaborated further
142	I assume one is still talking about before intervention here, if so, it would be add to the report to identify what entities were providing the harvesting practice and PPO management training and at what frequency.	Clarified
143	Repeat of text box. Use one or the other, not both.	Deleted
144	You must factor in geographical facts, Dzoti is small while Otjiu is huge with no cellphone coverage.	Ok
145	Do you have any idea on how Puros might improve? If so, please add to text. Otjiu-West PPO needed improvements are clear from previous paragraph.	Clarified
146	One harvester or a concensus among several harvesters? Please be clear. Was this information generated from a FGD?	Clarified
147	Is there one management borad for both Eudafano and TTC? Or should this sentence read …..through Conservancy management committee or the Eudafano and TTC management boards and the institutions and buyers?	Clarified
148	It seems that one buyer could actually suppress prices; can NORC describe why that isn't the case here?	Devil's Claw PPOs for instance are able to find new buyers which could be the case for other PPOs eventually
149	Please name these private sector partners if possible.	We cannot for confidentiality purposes
150	Does this refer to the private sector partners in the previous sentence? If so, it is important to indicate who these partners are.	See above comment
151	Again, need to state who these informants are.	See above comment
152	Were some undertaken (contrary to the table early on in the INP section)?	From midline round.
153	What does this mean? Please provide details.	Clarified
154	Please provide a clear statement on whether the Market Bulletin provided information on the volumes, markets, key players, etc. Then provide your opinion based on FGDs and KIIs on whether the Market bulletin was useful to them and explain why it was or was not useful.	Edited
155	Any information gleaned from KIs or FGDs on why this was the case? If so, it would be good to add this information to the report.	Edited

#	Comment text	Response
156	What intervention, the Market Bulletin? If this is paragraph is discussing generalities of the PPO sub-activity then it should be located elsewhere in the report (e.g. in the concluding section that brings all the summary remarks about each of the research questions together in one place in the report and then makes concluding remarks based on the summary remarks.	The market bulletin is also related to the demand side and as such the demand side is discussed here.
157	Please state that there was no quantitative analysis done.	Edited
158	Out of how many?	Edited
159	Perhaps this could be worded better.	Edited
160	Not enough time in reference to what, the end of Compact implementation? It was never intended that the INP grants be finished well before the end of the Compact. Follow-on activities based on these gratns were to be done with separate funding and after the Compact.	Edited
161	What is “this”, the cost of processing or the added value due to processing?	Edited
162	Again what is expected to increase 35 – 40%, and why is it just for some of the material produced?	Edited
163	This needs to be reworded. It is confusing as written, is one discussing the value of domestically processed Devil’s Claw or the cost of domestic processing?	Edited
164	Please explain what is meant by implementing partners.	Edited
165	Was the reorganization due to the organizational audit? Did MCA-N have a role in making the audit happen? If, so please explain this in the text.	Edited
166	It was not the mandate of MCA-N to determine the mandate of IPTT	This is not quite true. Regardless of whether it was the mandate of MCA-N, they did fund multiple audits of the IPTT with the intention of describing the way forward.
167	incorrect	This is a direct quote from a highly involved key informant
168	This sentence needs to be re-worded.	Edited
169	There may have been more of an emphasis on the supply side, but I wouldn’t go so far as to say that there was no effort on the demand side or on US markets (e.g. research and market entry planning for DC done by TAMU and EcoSo). There is other European market work that was done as well. Best to review deliverables and talk with Dave Cole about additional marketing work that was done.	Edited
170	True of PPOs and conservancy management? Was this anticipated by the project at all and addressed in trainings?	Edited

#	Comment text	Response
171	What structures are referenced here? If PPOs, weren't many of them existing before the Compact?	Management structures were not in place as compared to EWC and conservancy lead PPOs. In particular, DC PPOs that are not part of a conservancy and were organized after the compact ended are at risk due to the lower level of underlining management structures.
172	Please explain what this is and their role.	Added
173	I don't think this is discussed above. Please consider what other lay of the land would be useful for following discussion of PPOs.	Ok
174	What can NORC say about the extent of business training that was undertaken?	Added clarification
175	Is that the case for younger women as well? Is there a sense or evidence that they have better opportunities?	It may be more attractive for young women as they grow up and faced with limited life choices.
176	Why are you saying possible? Don't you have data on price/kg to confirm this?	Edited
177	Is this NORC's summary of overall results from the intervention? Please expand to provide an overall summary and note about policy implications.	Ok
178	This report ended just abruptly, leaving a reader the question "so what?" No summary of findings and discussion, policy implications, recommendations and conclusion.	Added
179	Zero or na??	Corrected
180	Zero or na??	Corrected
181	Same as below???	Same as below
182	Same???	Same as below
183	Are you sure none is duplicated, i.e. hh surveyed for more than one INP???	Yes we are sure