

# Namibia - Community-Based Rangeland and Livestock Management

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## Overview

### Identification

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**COUNTRY**

Namibia

**EVALUATION TITLE**

Community-Based Rangeland and Livestock Management

**EVALUATION TYPE**

Independent Impact Evaluation

**ID NUMBER**

DDI-MCC-NAM-IE-AG1-2014-v2

### Version

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**VERSION DESCRIPTION**

Anonymized dataset for public distribution

## Overview

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**ABSTRACT**

This report provides the results of a mixed-methods randomized independent impact evaluation of the Community-Based Rangeland and Livestock Management (CBRLM) sub-activity, which was implemented by the Gesellschaft für Organisation, Planung und Ausbildung (GOPA) Consortium under the Namibia Compact.

Research design: Innovations for Poverty Action (IPA) implemented a randomized evaluation of the CBRLM sub-activity, using both quantitative and qualitative assessments to measure the program's effectiveness. IPA investigated whether CBRLM led to improved rangeland and livestock management best practices among participating farmers, and whether these management changes then led to improvements in three outcome areas: (1) the sustainability of the rangeland, (2) the productivity of cattle herds, and (3) household income and well-being. The evaluation randomly assigned CBRLM eligibility to 21 of 41 rangeland intervention areas (RIAs) in the northern communal areas of Namibia, and collected data in approximately 2-to-5 grazing area communities in each RIA that were determined most likely to participate based on pre-program indicators. A baseline assessment of household income and cattle ownership was conducted in 2011, but the data were not used in analysis because of insufficient overlap between the grazing areas where baseline data were collected and the grazing areas where the CBRLM program was ultimately implemented.

Key findings of the evaluation are summarized below:

**Implementation and Uptake**

- The program delivered trainings, support funds, livestock inputs, community facilitation, and water infrastructure as expected. However, it only met or exceeded three out of seven output targets.
- 76 percent of households in the 58 grazing area communities offered the program chose to participate.

**Behavioral Outcomes**

- Compared to farmers in comparison areas, farmers in CBRLM areas were more likely to follow a communal grazing plan, graze their cattle in groups with their neighbors, and participate in grazing area committees.
- At program end, farmers in CBRLM areas were more likely to deworm their cattle, and took them to water sources more frequently.
- Program impacts on collective rangeland management persisted two years later but effects on animal husbandry practices diminished.

- The program did not impact livestock marketing or herd composition.

#### Rangeland, Livestock, and Economic Impacts

- CBRLM areas exhibited slightly worse rangeland outcomes than comparison areas two years after program end.
- Two years after program end, CBRLM had no impact on cattle herd size, health, or productivity.
- Three years after program end, CBRLM had no impact on household income, expenditure, economic security, or nutrition.

### EVALUATION METHODOLOGY

Randomization

#### UNITS OF ANALYSIS

The unit of randomization is the Rangeland Intervention Area, which are intervention zones with commonly agreed upon boundaries, common authority, and predefined (by the program implementer) characteristics such as fencing and accessibility.

The unit of analysis depends on the outcome:

- (1) Baseline Household Survey: households (not used in analysis)
- (2) Baseline Cattle Survey: households (not used in analysis)
- (3) Qualitative Data Collection: individuals
- (4) Kraal Manager Survey: other (kraal / kraal manager)
- (5) Kraal Manager Survey Direct Observation: other (grazing area / kraal)
- (6) Rangeland Manager Survey: other (rangeland site)
- (7) Endline Cattle Survey: other (kraal)
- (8) Endline Household Survey: households
- (9) Headman Survey: other (headman)

#### KIND OF DATA

Sample survey data [ssd]

#### TOPICS

Topic	Vocabulary	URI
Agriculture and Irrigation	MCC Sector	

#### KEYWORDS

CBRLM, Agriculture, Rangeland, RIA, Grazing area, Livestock, Cattle, Northern Communal Area, NCA, Randomization, IPA, GOPA, Namibia, Herd

## Coverage

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#### GEOGRAPHIC COVERAGE

The CBRLM sub-activity covers parts of seven regions in northern Namibia: Kunene, Omusati, Oshana, Ohangwena, Oshikoto, Kavango East, and Kavango West.

#### UNIVERSE

- (1) Baseline Household Survey: households overseeing 10 or more cattle in selected grazing areas
- (2) Baseline Cattle Survey: cattle owned by a sampled household at baseline

(3) Qualitative Data Collection: participating farmers in CBRLM grazing areas, non-participating farmers in CBRLM grazing areas, and non-participating farmers in non-CBRLM grazing areas

(4) Kraal Manager Surveys: kraal managers overseeing 10 or more cattle that grazed primarily in a sampled grazing area at the start of treatment

(5) Kraal Manager Survey Direct Observation: kraal managers overseeing 10 or more cattle that grazed primarily in a sampled grazing area at the start of treatment

(6) Rangeland Surveys: randomly selected sites in each grazing area

(7) Endline Cattle Survey: any cattle owned by a sampled kraal manager

(8) Endline Household Survey: any household with 10 or more cattle that kept cattle in a sampled kraal

(9) Headman Survey: the local headman of each selected grazing area

## Producers and Sponsors

### PRIMARY INVESTIGATOR(S)

Name	Affiliation
Innovations for Poverty Action	

### FUNDING

Name	Abbreviation	Role
Millennium Challenge Corporation	MCC	

## Metadata Production

### METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Millennium Challenge Corporation	MCC		Metadata Producer

### DATE OF METADATA PRODUCTION

2020-05-04

### DDI DOCUMENT VERSION

Version 2.0 (Original: 2014-11-06): Revised to describe evaluation as implemented and findings.

### DDI DOCUMENT ID

DDI-MCC-NAM-IE-AG1-2014-v2

## MCC Compact and Program

### COMPACT OR THRESHOLD

Namibia Compact

### PROGRAM

The Community-Based Rangeland and Livestock Marketing sub-activity centered on helping rural communities develop and implement their own land-use management strategies with an aim of reducing environmental degradation, improving livestock productivity, and increasing household income in Namibia's Northern Communal Areas. Between 2010 and 2014, the implementer worked with 58 communities to help identify each community's specific needs and optimal strategies for rangeland and livestock management. The implementer then supported these strategies with a package of technical, financial, and infrastructure support across five program areas: rangeland, livestock, marketing, water, and community development.

### MCC SECTOR

Agriculture and Irrigation (Ag & Irr)

**PROGRAM LOGIC**

The CBRLM sub-activity was organized around five areas that were all aimed at improving household well-being: community development, rangeland management, livestock management, livestock marketing, and targeted infrastructure support (including substantial investment in water access). As immediate outputs of the intervention, participants, field staff, and government partners were trained on improved rangeland and livestock management practices; committees were organized to oversee communal grazing areas and boundaries were defined for those grazing areas; livestock cooperatives were established and livestock auctions were conducted; and water infrastructure was upgraded. Short-term outcomes included grazing area committees functioning with the implementer's support; participants implementing the improved rangeland and livestock practices; livestock cooperatives becoming more functional; and increased capacity and motivation of staff and government partners to support these efforts. Expected intermediate outcomes included grazing area communities functioning autonomously; measurable improvements in cattle and rangeland quality; increased marketing opportunities and offtake; and continued support from government and community leaders for the CBRLM practices. Ultimately, the intervention was expected to lead to an increase in household incomes and a reduction in poverty.

**PROGRAM PARTICIPANTS**

The program focused on cattle-owning households in the Northern Communal Areas of Namibia.

# Sampling

## Study Population

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(1) Baseline Household Survey: households overseeing 10 or more cattle in selected grazing areas (2) Baseline Cattle Survey: cattle owned by a sampled household at baseline (3) Qualitative Data Collection: participating farmers in CBRLM grazing areas, non-participating farmers in CBRLM grazing areas, and non-participating farmers in non-CBRLM grazing areas (4) Kraal Manager Surveys: kraal managers overseeing 10 or more cattle that grazed primarily in a sampled grazing area at the start of treatment (5) Kraal Manager Survey Direct Observation: kraal managers overseeing 10 or more cattle that grazed primarily in a sampled grazing area at the start of treatment (6) Rangeland Surveys: randomly selected sites in each grazing area (7) Endline Cattle Survey: any cattle owned by a sampled kraal manager (8) Endline Household Survey: any household with 10 or more cattle that kept cattle in a sampled kraal (9) Headman Survey: the local headman of each selected grazing area

## Sampling Procedure

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The 41 RIAs in our sample were randomly assigned to either have the CBRLM intervention offered to communities within the RIA or not to have the intervention offered. For primarily political reasons, the RIAs were stratified on a single variable: affiliation with a Traditional Authority (TA). This was to ensure that at least half of every politically-sensitive TA was included in the CBRLM intervention. IPA then checked whether random assignment was correlated with any of the variables identified by GOPA as potentially important determinants of the intervention's success. If a nontrivial level of correlation was detected, we re-randomized the sample and then re-ran the balancing diagnostics until stratified, balanced lists were produced.

For baseline data collection, grazing areas were sampled based on pre-project predictions about where CBRLM would be implemented. The data from the baseline assessment was not ultimately used because of insufficient overlap between the grazing areas where baseline data was collected and the grazing areas where the CBRLM was ultimately implemented.

(1) Baseline Household Surveys: randomly selected households from targeted grazing areas

(2) Baseline Cattle Surveys: 30 randomly selected cattle from randomly sampled baseline households

For endline data collection, 123 grazing areas were sampled within each RIA based on their predicted probability of program participation based on pre-treatment covariates.

(3) Qualitative Data Collection: grazing areas were purposively selected in order to be representative of high-, medium-, and low-performing grazing areas; participating and non-participating farmers, and grazing area committee members were selected purposively by asking community leaders to provide a mix of male/female and wealthy/non-wealthy farmers; leaders of 8 of the non-participating communities were also interviewed

(4) Kraal Manager Surveys: up to 13 randomly selected kraal managers from a complete census of kraals in the grazing area (11 in first kraal manager survey, with 2 additional randomly selected kraal managers in second kraal manager survey)

(5) Kraal Manager Survey Direct Observation: 2014: Visited (i) all grazing areas for water point management information; (ii) all grazing areas where either combined herding or coordinated grazing were taking place to directly observe grazing; and (iii) where community group activities were reported. 2017: Randomly selected three kraals from each grazing area.

(6) Rangeland Surveys: up to 10 randomly selected rangeland sites within geographical boundary of sample grazing areas

(7) Endline Cattle Survey: all cattle owned by 6 randomly selected kraals in each grazing area from those interviewed during the 2014 kraal manager survey

(8) Endline Household Survey: one randomly selected household owning at least 10 cattle that kept cattle in a sampled kraal

(9) Headman Survey: the local headman of each sampled grazing area

## Deviations from Sample Design

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There were no major deviations from the planned sampling design.

## Response Rate

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Baseline Household Survey: 78.3%

Baseline Cattle Survey: 76%

2014 Kraal Manager Survey: 99%

2016 Kraal Manager Survey: 96%

2014 Kraal Manager Direct Observation: 100% (of grazing areas)

2017 Kraal Manager Direct Observation: 82% (of kraals)

Endline Cattle Survey: 96%

Endline Household Survey: 97%

Headman Survey: 96%

NOTE: The reported sample size in results deviate from the response rate in two ways: (1) we considered the same kraal manager who keeps cattle in two grazing areas as 2 respondents during sampling and surveying, but consolidated to one respondent in analysis; (2) even when a respondent participated in the survey, if data for a given outcome was missing, then they were dropped from that analysis.

## Weighting

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None

# Questionnaires

## Overview

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This report draws on a unique combination of data collection strategies to test the impact of CBRLM across multiple dimensions.

- (1) Baseline Household Survey: collected data from 2,964 households in 2011 to establish baseline consumption patterns and income of cattle-owning households. Data were not used in analysis because of insufficient overlap between areas selected for baseline data collection and areas of project implementation.
- (2) Baseline Cattle Survey: weighed, aged, and scored over 17,000 cattle to establish baseline cattle productivity and herd structure. Data were not used in analysis because of insufficient overlap between areas selected for baseline data collection and areas of project implementation.
- (3) Qualitative Data Collection: conducted 30 focus group discussions and in-depth interviews to assess qualitative responses to program implementation and outcomes.
- (4) Kraal Manager Survey: collected survey data from 1,200 kraal managers in 2014 and 2016 to assess changes in management practices and social dynamics; corroborated key behaviors with hundreds of direct-observation visits.
- (5) Kraal Manager Survey Direct Observation: collected data from 123 grazing areas in 2014 to assess collective grazing practices, community group participation, payments and water point management; collected data on 358 kraals in 2017 to assess collective grazing practices, herder support, community group participation.
- (6) Rangeland Survey: collected ground-level grass and soil data from over 1,000 rangeland sites in the rainy and dry seasons to evaluate changes in ecological productivity and resilience.
- (7) Endline Cattle Survey: weighed, aged, and scored over 20,000 cattle to measure changes in cattle productivity and herd structure.
- (8) Endline Household Survey: collected data from 1,250 households on consumption patterns, income, wealth, and food security of cattle-owning households; included interviews with 123 local headmen (i.e., traditional leaders) in each grazing area to gauge changes in community governance.
- (9) Headman Survey: collected data from 123 local headmen on headman attitudes and grazing-area level information.

## Data Collection

### Data Collection Dates

Start	End	Cycle
2011-03-01	2011-06-30	Baseline Household Survey
2011-09-01	2011-11-30	Baseline Cattle Survey
2014-06-01	2014-07-31	Qualitative Data Collection
2014-08-01	2014-11-30	2014 Kraal Manager Survey
2014-08-01	2014-11-30	2014 Kraal Manager Survey Direct Observation
2016-05-01	2016-06-15	2016 Kraal Manager Survey
2016-05-01	2016-06-15	Rangeland Survey - rainy season
2016-08-01	2016-09-30	Rangeland Survey - dry season
2016-09-01	2016-11-30	Endline Cattle Survey
2017-04-01	2017-06-15	Endline Household Survey
2017-04-01	2017-06-15	Headman Survey
2017-04-01	2017-06-15	2017 Kraal Manager Survey Direct Observation

### Data Collection Mode

(1) Kraal manager surveys: in-person surveys with kraal manager (2) Rangeland surveys: rangeland data collection (soil samples, stick-and-notch, quadrat analysis) (2) Cattle survey: cattle weighing, ageing, and body condition scoring (3) Household survey: in-person surveys with head of household

### Data Collection Notes

#### (1) Baseline household survey

- Data collection was carried out by NORC, a US-based data collection firm
- The survey took an average of 1 hour and 30 minutes to complete. Interviews were conducted in the primary language of the respondent.

#### (2) Baseline cattle survey

- Each data collection team consisted of a team leader, one-to-three cattle handlers, and a data inputter
- Cattle weighing took between 2 and 4 hours. Interviews with cattle owners were conducted in the primary language of the respondent.

#### (3) Qualitative Data Collection

- Each interviewing team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group. Data collection took place over a period of approximately 6 weeks.
- The team mobilized respondents to attend focus group discussions and conducted discussions with groups of participating farmers, non-participating farmers, and grazing committee members. Focus group discussions took approximately 2 hours. The team also conducted in-depth interviews with non-participating traditional authorities.

#### (4a) 2014 Kraal Manager Survey

- Each interviewing team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group. Data collection took place over a period of approximately 6 weeks. Interviewing took place six days per week during the fieldwork period.
- Interviews took between 30-45 minutes for the primary questionnaire. Interviews were conducted primarily in primary language of the respondent.

#### (4b) 2016 Kraal Manager Survey

- Each interviewing team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group. Data collection took place over a period of approximately 6 weeks. Interviewing took place six days per week during the fieldwork period.
- Interviews took between 45 minutes and an hour for the primary questionnaire. Interviews were conducted primarily in primary language of the respondent.

#### (5a) 2014 Kraal Manager Survey Direct Observation

- Teams visited all grazing area water points and documented when cattle arrived at water point, whether there was a lock, and asked nearby herders some questions about water point use.
- In grazing areas where community groups were reported, surveyors asked the secretary of the community group for an

attendance sheet and recorded information about most recent meetings, attendees, and contributions.

- In grazing areas where coordinated herding was reported, surveyors located the combined herd and reported basic information about herding practices and participating kraals.

(5b) 2017 Kraal Manager Survey Direct Observation

- Teams visited three randomly selected kraals and followed the herd throughout the day and recorded basic information about herding practices and herder equipment.

- Teams also asked for meeting minutes and budget from each grazing area committee list and recorded attendance and contributors.

(6a) Rangeland Survey - rainy season

- Each data collection team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group.

- Data collection techniques are described in the evaluation report.

(6b) Rangeland Survey - dry season

- Each data collection team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group.

- Data collection techniques are described in the evaluation report.

(7) Endline Cattle Survey

- Assessment followed the steps below:

· First, surveyors rounded up the farmer's entire herd in a kraal and recorded the total number of cattle present.

· Second, surveyors passed each cow or bull in the herd through a mobile crush pen and scale provided by IPA. As this happened, electronic survey software told the enumeration team whether this animal had been randomly selected for assessment.

· If the animal was selected, enumerators situated it on the scale and recorded its weight and body condition score (semi-subjective 1-5 scale measure of nutrition).

· Enumerators then placed the animal in a neck clamp and aged it by dentition. (Extremely young calves were aged visually instead.)

· In addition to the 30 randomly selected cattle, enumerators weighed all bulls in the herd.

· If the farmer's entire herd was not weighed that day, enumerators returned to the kraal multiple times until they had assessed all cattle. Surveyors painted cattle with a mark upon passing them through the crush pen to assure they were never assessed twice.

- Cattle weighing took between 2 and 4 hours. Interviews with cattle owners were conducted primarily in primary language of the respondent.

(8) Endline Household Survey

- Each interviewing team consisted of pairs of surveyors, usually one male and one female, who travelled together as a group. Data collection took place over a period of approximately 6 weeks. Interviewing took place six days per week during the fieldwork period.

- Interviews took between 45 minutes and one hour and fifteen minutes for the primary questionnaire. Interviews were conducted primarily in primary language of the respondent.

(9) Headman survey

- The headman survey took place alongside the Household Survey. In each grazing area, the assigned team identified the local headman and conducted a 1 hour survey with him or her.

## Questionnaires

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(9) Headman Survey: collected data from 123 local headmen on headman attitudes and grazing-area level information.

## Data Collectors

Name	Abbreviation	Affiliation
Innovations for Poverty Action	IPA	
NORC at the University of Chicago	NORC	University of Chicago

## Supervision

### + Qualitative Teams

- The qualitative surveys were conducted by three teams of two members each. The teams were responsible for their own mobilization and logistics, and reported to the project supervisor.

### + Kraal Manager Survey Teams, Kraal Manager Direct Observation Teams, Household Survey Teams (Endline), and Headman Survey Teams

- Regional managers planned and oversaw data collection and conducted data checks
- Regional supervisors managed regional logistics, finances, mapping, and listing, and interfaced with local authorities
- Assistant supervisors conducted surveys and assisted regional supervisors
- Interviewing was conducted by regional teams of interviewers, each overseen by a regional manager
- Backchecks were conducted by Regional supervisors and assistant supervisors, both by random assignment and at the discretion of the regional manager

### + Rangeland Survey Teams

- The Rangeland Survey consisted of 10 teams of 2 surveyors
- Rangeland manager planned and oversaw data collection and conducted data checks
- Rangeland supervisors managed logistics and finances for a team of 20 and conducted mobilization
- Rangeland surveyors conducted ground-based rangeland data collection
- Backchecks were conducted by the regional supervisor

### + Cattle Survey Teams (Baseline and Endline)

- The Cattle Survey consisted of regional teams divided into 5 person-units
- Regional managers planned and oversaw data collection and conducted data checks
- Regional supervisors managed regional logistics, finances, mapping, and listing, and interfaced with local authorities
- Unit Leaders managed logistics and finances for the 5-person teams, conducted mobilization and located farmers
- Cattle surveyors were one member of each team that helped with communication, conducted surveys with kraal manager, and conducted backchecks

- Cattle handlers were three members of each team that helped weighing cattle (constructing crush pens, weighing, ageing, assessing body condition)
- Mobilizers were one individual in each region who reached out to cattle owners prior to visit
- Backchecks were conducted by Regional supervisors and assistant supervisors, both by random assignment and at the discretion of the regional manager

+ Baseline Household Survey Team

- The Baseline Household Survey consisted of 7 teams, each with a supervisor, field editor, and five enumerators.
- The teams travelled within regions reflecting their language ability.

## Data Processing

### Data Editing

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The surveys were completed using SurveyCTO. The data was subsequently downloaded from the SurveyCTO server into Stata and cleaned in the following process:

- a) Insheeting
- b) Anonymization
- c) Formatting
- d) Cleaning
- e) New Variable Creation
- f) Index Creation
- g) Analysis

### Other Processing

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Data was captured by surveyors using SurveyCTO.

Two levels of checks were implemented. First, daily data checks were conducted, both using an automated STATA do file and using eye checks, to test for observations that were non-sensical or far away from team or regional averages. Second, back checks were conducted on a random subset of interviews to identify errors.

## Data Appraisal

No content available