

# THE NAMIBIAN ROOT CROPS RESEARCH PROJECT BASELINE INFORMATION ON SWEET POTATO AND CASSAVA IN THE OKAVANGO AND CAPRIVI REGIONS

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## ABSTRACT

The north-eastern Okavango and Caprivi regions are the main target regions of the Namibian Root Crops Research Project. In these two regions a baseline survey on sweet potato and cassava production was conducted in 1996. A total of 117 people were interviewed in five villages situated either next to a river or inland. General information was obtained from root crop producers in this group. As previously conceived, survey results confirmed that production levels of these two crops are very low. Of the interviewed households 25% produce sweet potatoes and only 8% produce cassava. Both crops are generally produced on small scale for own consumption, only 26% of the interviewed producers sell part of their crop. Sweet potato is mostly ranked fourth after pearl millet, sorghum and maize in crop importance rankings. Cassava is a relatively new crop to the Okavango region and is ranked least important. The most important constraint to production of these two crops is the unavailability of planting materials. Most of the previously existing sweet potato materials have been lost in recent years of drought. There is a high level of interest in producing root crops, however many survey participants expressed the need of more information on the production of both crops.

## INTRODUCTION

The initial work of the Namibian Root Crops Research Project is concentrated in the Okavango and Caprivi regions in north-eastern Namibia. This area receives 500 or more mm of rainfall annually during a short rainy season from November to April. The Okavango and Caprivi regions are bordered by the Kavango and Zambezi rivers respectively. Due to drought prone growing seasons, shortages of the staple food pearl millet are frequently experienced. It is perceived that a minority of rural residents currently cultivate and consume sweet potato and cassava (1994/95 Namibia Agricultural Census). Root crops are additional foods and development of their production therefore has the potential to impact significantly on food security in the region.

In 1990 the Government of Namibia sought assistance from the Food and Agriculture Organisation (FAO) to advise on the improvement of cassava production in northern Namibia. A resulting request by the FAO to the International Institute of Tropical Agriculture (IITA) in Nigeria and its former Eastern and Southern Africa Root Crops Research Network (ESARRN) led to a visit by two scientists to Namibia in 1991 (Alvarez & Mahungu, 1991). During 1993 the Southern Africa

Root Crops Research Network (SARRNET) was developed by the Southern Africa Centre for Co-operation in Agricultural Research (SACCAR) as specified in a project proposal by SADC and IITA. SARRNET is funded by USAID and the International Development Research Centre (IDRC), specifically to sponsor cassava and sweet potato research and development in all countries of SADC. The project was implemented in 1994 by IITA and the International Potato Centre (CIP) in Kenya. During 1994 the SARRNET coordinator and a regional scientist visited Namibia to develop a root crops research program at the annual planning meeting of the Division Plant Production Research (Teri & Muimba-Kankolongo, 1994). Work plans and budget for the Namibian Root Crops Research Project were approved by the Government of Namibia and SARRNET Steering Committee meetings during 1995.

A baseline survey was undertaken in 1996 to obtain information and data on the level of awareness on root crops among rural residents, levels of production and production practices in the Okavango and Caprivi regions. The information is essential in effectively directing research and extension activities undertaken on root crops with limited time and resources.

## METHOD

Two representative villages in the vicinity of each of the three Research Stations in the Okavango and Caprivi regions were chosen for the baseline survey (Annex A2: map of Okavango region and Annex A3: map of Caprivi region). One community in each pair is at a river and the other inland, indicating that it is away from a river and dependant on rainfall and groundwater. In each of these six communities any twenty households, regardless whether they grow root crops or not, were approached to participate in the survey. This approach enables a quantitative estimation of root crop growers in the villages. From those which do grow root crops, information was gathered by informal discussion guided by a checklist on applicable topics, including relative importance of the crop in the farming system, varieties, cultural practices, planting material, plant health, production, post-harvest practices, marketing, constraints and gender issues. The survey was carried out by Research Technicians from the three Research Stations together with Extension Technicians or Farming Systems Research Technicians for the area. In Mbwata, the river community chosen near Mashare Agricultural Development Institute, the survey on individual households was not completed. A group meeting held with villagers revealed that survey results would be similar to those of the inland community.

## RESULTS

### Relative Importance of Sweet Potato and Cassava in the farming systems

The staple food crop in the northern communal areas of Namibia is pearl millet. Of the 117 households interviewed 25% grow sweet potatoes and only 8% grow cassava (Table 1). In rankings according to importance of crops, root crops

are generally ranked fourth after the grains, pearl millet, sorghum and maize. Root crops are grown for own consumption, only 26% of the growers sell part of their crop. Almost all survey participants are aware of root crops, more so of sweet potatoes. It is seen as additional food, especially in dry years when pearl millet yields are poor. In such dry seasons sweet potato plots near the Kavango river can be watered, offering greater household food security than the rainfed pearl millet.

TABLE 1: SUMMARY OF ROOT CROP PRODUCTION LEVELS IN THE OKAVANGO AND CAPRIVI REGIONS.

Station	KATIMA	KATIMA	BAGANI	BAGANI	MASHARE		
Situation	Inland	River	Inland	River	Inland		
Village	Sibbinda	Lisikili	Shamunaro	Shamughongo	Taratara	Total	
Total Interviews	20	20	27	30	20	117	%
PROPORTION OF GROWERS							
Growers	6	5	5	8	7	31	26
Former Growers			6	4	3	13	11
Sweet Potato	6	4	5	8	7	30	25
Cassava	3	1	2	3	0	9	8
RANKING							
Rank Range	2 to 7	3 to 7	2 to 4	1 to 4	1 to 4	1 to 7	
Rank Mean	4.4	4.4	4	3	3		
CONTRIBUTION TO HOUSEHOLD FOOD SECURITY AND CASH INCOME							
Own use	6	5	5	8	7	31	100
Sale	1	0	0	1	6	8	26

### VARIETIES

In the Okavango region mainly two sweet potato varieties are grown, whereas several varieties are grown in the Caprivi region. Only one type of cassava is known along the

Kavango river. At least three cassava varieties are found along the Zambezi river (Table 2). Varietal characteristics desired by some survey participants are a high yield potential, a short production season, non-spreading short vines and resistance to pests and diseases.

TABLE 2: VARIETIES OF SWEET POTATO AND CASSAVA IN THE OKAVANGO AND CAPRIVI REGIONS.

Variety name	Major characteristics	Origin	Uses
SWEET POTATO VARIETIES IN THE OKAVANGO REGION			
Shinguru	red tubers, green leaf veins, less sweet	Local	Tubers and leaves
Kavandja	white tubers, purple leaf veins, sweet	Local	Tubers and leaves
CASSAVA VARIETIES IN THE OKAVANGO REGION			
Utomo (Mwandja)	brown skin, white flesh, sweet, tasty leaves, drought tolerant	Angola, across Okavango river	Tubers and leaves
SWEET POTATO VARIETIES IN THE CAPRIVI REGION			
Unknown	white tubers, upright growth habit	Solwezi, Zambia	Tubers and leaves
Shesheke	red tubers, yellow flesh	Local	Tubers and leaves
Kanjoro	white tubers, white flesh	Local	Tubers and leaves
Chibukumane	big red tubers, yellow flesh, early	Unknown	Tubers and leaves
Unknown	white tubers, white flesh	Unknown	Tubers only
CASSAVA VARIETIES IN THE CAPRIVI REGION			
Kapumpa	white pulp, early maturing, good yield	Unknown	Tubers and leaves
Sikonko	red skin	Unknown	Tubers and leaves
Kangolo	reddish skin, tasty leaves	Zambia	Tubers and leaves

## PLANTING MATERIAL

Planting material is generally scarce. Local varieties and planting materials are often said to be inherited over generations. Some growers have enough planting materials for themselves and are able to distribute surplus materials among neighbours and friends. Planting materials are generally not sold. People moving from the river to inland communities often bring planting materials with them. Sweet potato planting materials are always kept from the crop of the previous season. A few growers depend on growth from residual tubers from the previous season in the soil. Length of sweet potato cuttings depends on the quantity of planting material available and varies between 15 cm and 50 cm.

Not much is known about quality and selection of planting material. Cassava cuttings are normally taken from the top and middle parts of existing plants in the plot.

## CULTURAL PRACTICES

A summary of cultural practices is given in Table 3. Planting, weeding and harvesting is done by hand by members of the family, almost all root crop plots are not irrigated and soil fertility is only sometimes maintained by applying manure. Sites chosen for sweet potato are generally those with richer soils that have a better water retaining capacity than sandy soils.

**TABLE 3: CULTURAL PRACTICES FOR SWEET POTATO AND CASSAVA PRODUCTION IN THE OKAVANGO AND CAPRIVI REGIONS**

	SWEET POTATO		CASSAVA
	OKAVANGO	CAPRIVI	CAPRIVI
Cropping System	Mostly monocultures for home use Some intercropping with maize/sorghum		Some monocultures Often intercropped with maize
Site	River terrace Shallow temporary pools with soft loamy soils in dry rivers (muramba / dikorokoro) valleys (muronga)		River terrace Sand-clay or sandy inland plots
Land Preparation	By hoe, often ploughing with oxen, when rains start in October - December		
Planting Method	Cuttings half into soil or rolled up, ends left sticking out of soil On planting stations, flat or on plough ridges		Cuttings half into soil Slanted or upright
Spacing	Varying between 0.3m to 0.5m in rows 2m between rows		1m in rows 2m between rows
Weeding	By hand or with hoe		
Irrigation	None	Some only after planting if water is available	
Soil fertility	No manure or fertilisers	Some growers apply manure only	
Labour	Family, mostly women		
Harvest Time	Some Dec - Jan Normally May - August	May - August	October - December One year after planting
Harvest Method	By hand with hoe ploughed out collected	by hand with hoe	by hand
Crop Rotation	None		

## PRODUCTION:

Since root crops serve only as additional food, generally small areas are planted in form of home gardens. Only a few fields of a size larger than a few square meters could be found. Production from these small areas planted to root crops ranges from some buckets to a few bags. Tubers and leaves are normally harvested when they are used, as is the case for home grown vegetables. Sweet potato is mainly planted for the tubers, the production of leaves is not always important and therefore not measured.

## POST-HARVEST

Survey participants seemed little aware of post harvest losses and storing abilities of root crops (Table 4). Sweet potatoes are generally not stored for long periods because they are harvested as they are consumed.

**TABLE 4: POST-HARVEST CHARACTERISTICS OF ROOT CROP PRODUCTION AND CONSUMPTION IN THE OKAVANGO AND CAPRIVI REGIONS.**

	SWEET POTATO	CASSAVA
Uses and forms of utilisation	Leaves: salad or boiled as relish Tubers: fresh, boiled, porridge	Leaves: pounded and boiled as relish Tubers: fresh tubers for frying, flour for bread and porridge
Storage	Any place safe from animals Spread on empty bags on roof and covered with empty bags	In bags In traditional storeroom
Processing	Tubers: sometimes sun dried	Left soaking in water, dried and pounded into flour Fresh tuber shredded, fried and stirred into porridge in boiling water
Post-harvest Losses	Damage to tubers during harvest causes rotting	
Post-harvest Constraints	Transport of tubers from field to homestead Poor storage facilities	

### MARKETING AND MARKETS

If at all, only a part of the sweet potato crop is sold to other inhabitants of the village a producer lives in. Tubers are normally sold when just harvested and the tubers are still fresh. Prices primarily depend on the availability of the product in the village. When sold tubers are sorted and priced by size. Tubers loose quality when damaged by weevils and are sold for less than clean tubers. Constraints mentioned are lack of transport and no nearby markets. Local markets are often considered poor because villagers have little money to spend on less important foods.

Cassava tubers have been sold locally in villages and so far no market constraints have been experienced.



**HARVEST OF SWEET POTATO VARIETIES AT BAGANI RESEARCH STATION**

### PLANT HEALTH

Survey participants generally have almost no knowledge on root crops diseases.

No nutritional disorders are known.

Weeds are removed by hand or hoe as in other crops.

Root damaging rodents as are the main causes of yield and quality losses. Other pests include leafminers, weevils and grasshoppers on sweet potato and white scale on cassava (Table 5).

Pests are normally not controlled or managed. Some growers mentioned controlling leafminers by hand picking, moles by trapping with a bait prepared from wild onions, termites by dumping ashes around cassava plants and cassava scale by planting clean cuttings.

### CONSTRAINTS

Most survey participants mentioned the importance that root crops can have for their household food security and additional cash income, but the main constraint to production is the unavailability of planting materials. Many participants mentioned that their stock of materials have been lost in the recent seasons of drought. There is however a high level of interest in growing root crops among participants of the survey.



**HARVEST OF IMPROVED SWEET POTATO VARIETIES FROM A TRIAL AT KATIMA MULILO**

**TABLE 5: SUMMARY OF CONSTRAINTS TO ROOT CROP PRODUCTION IN THE OKAVANGO AND CAPRIVI REGIONS.**

Station	KATIMA	KATIMA	BAGANI	BAGANI	MASHARE		
Situation	Inland	River	Inland	River	Inland		
Village	Sibbinda	Lisikili	Shamunaro	Shamughongo	Taratara	Total	%
PROBLEMS (in order of importance)							
lack of planting material	14	15	14	17	13	73	62
Drought	7	5	14	3	3	32	27
lack in-formation		1	14	3	10	28	24
Moles	9	4	1	1	8	23	20
Termites	3		3		1	7	6
Insects		1		2	3	6	5
Animals	1		1	1	1	4	3
Market					4	4	3
Thieves					1	1	<1

## GENDER ISSUES

Of all interviewed growers about one third are women and two thirds are men (Table 6).

In households of married people the crop belongs to both, but men normally make decisions about crops. Women living alone with their children own their crop and take their own decisions. Allocation of tasks is to men and women, although women are more active in the fields. The allocation of income from sales is made by the man and he also has access to information.

Station	KATIMA	KATIMA	BAGANI	BAGANI	MASHARE		
Situation	INLAND	RIVER	INLAND	RIVER	INLAND		
Village	Sibbinda	Lisikili	Shamunaro	Shamughongo	Taratara	Total	%
Total Interviews	20	20	27	30	20	117	
Growers	6	5	5	8	7	31	26
Female	1	2	1	5	3	12	39
Male	5	3	4	3	4	19	61

**TABLE 6: PROPORTION OF FEMALE AND MALE ROOT CROP GROWERS IN THE OKAVANGO AND CAPRIVI REGIONS.**

## DISCUSSION

The baseline survey provides an overview of the status of root crop production which is necessary in directing future research activities. The decision taken earlier to concentrate more on sweet potatoes than on cassava is justified by the substantially higher level of sweet potato production in the two regions. Information on production practices and varieties which has been obtained from growers will be used for the evaluation of imported sweet potato and cassava varieties. Imported varieties are evaluated under dryland conditions with the involvement of producers in the area of the various Research Stations. Strategies to produce and distribute planting materials of local and improved varieties should involve local growers and the Extension Service. The production of planting materials for sale can be a business opportunity for any local grower. Further research will be necessary on observed pests and diseases to enable information dissemination of appropriate control measures.

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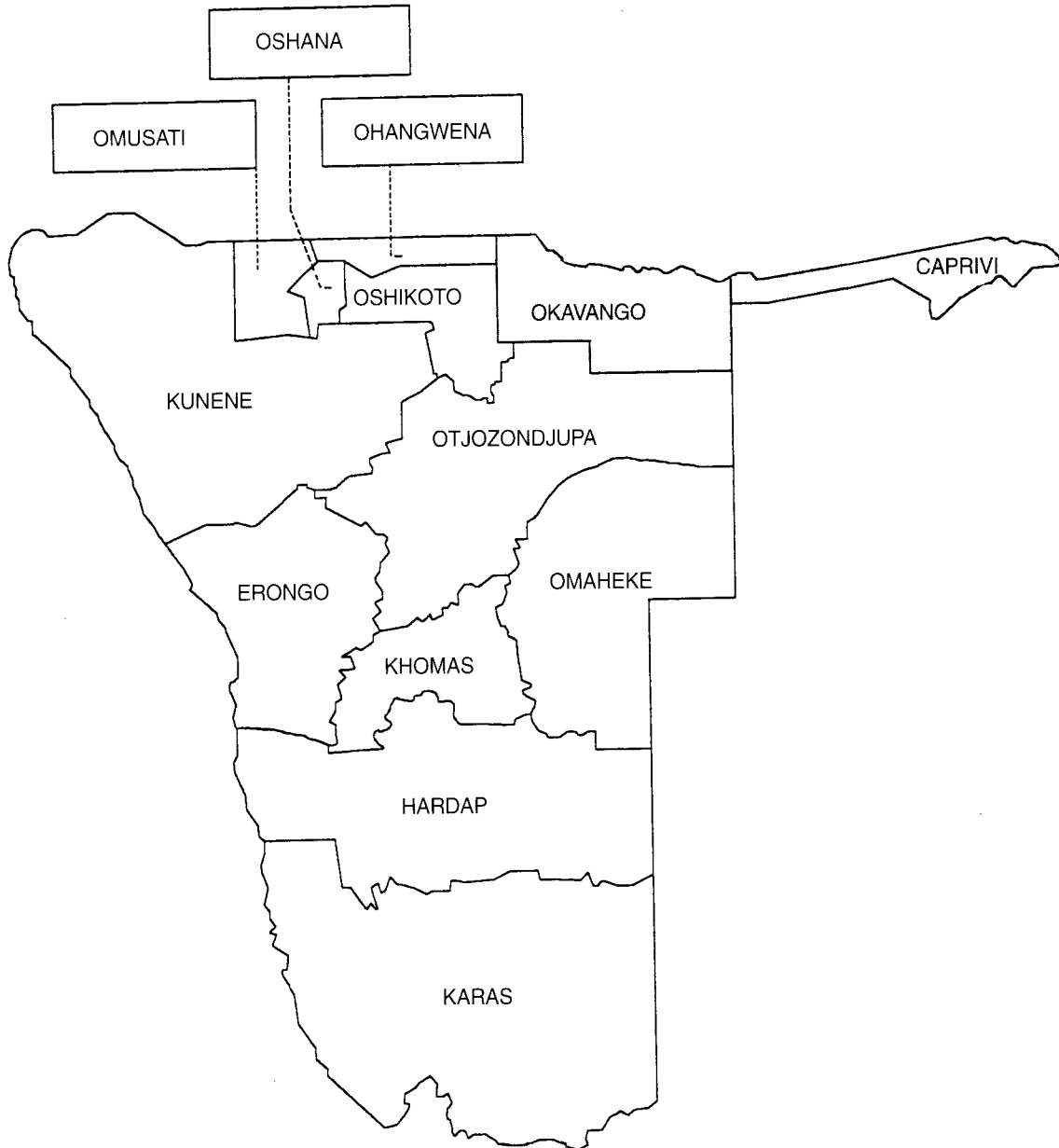
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OKAVANGO REGION

