ASSESSMENT OF THE SUSTAINABILITY OF PALM USE IN THE KAVANGO EAST REGION OF NAMIBIA

Submitted by Charlie Paxton to the Omba Arts Trust

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Birdplum trees *Berchemia discolour* planted next to homesteads

Makalani palms *Hyphaene petersiana* planted in homestead gardens

Funded by:

TABLE OF CONTENTS **Page**

ACRONYMS:

CBCD	Community-Based Craft Development
CBNRM	Community-Based Natural Resource Management
CBR	Community-Based Research
CLB	Communal Land Board
EO	Enterprise Officer
ERP	Every River has Its People
MET	Ministry of Environment and Tourism
MHT	Mud-hut Trading
MLR	Ministry of Land Reform
NACSO	Namibia Association for CBNRM Support Organisations
NCE	Namibian Chamber of Environmental
NGO	Non-Government Organisation
NNF	Namibia Nature Foundation
NR	Natural Resources
NRM	Natural Resource Management
OAT	Omba Arts Trust
RC	Regional Councillor
RF/SP	Rössing Foundation Shankara Project
SC	Shankara Craft
TA	Traditional Authority
VDC	Village Development Committee
WFTO	World Fair Trade Organisation

Makalani palm and Birdplum homestead garden planted in 1995

1. INTRODUCTION

The objectives of this assessment are to:

- determine whether the current increased levels of harvesting natural plants materials by commercial basket makers in Kavango East region is sustainable; and
- assess the effectiveness of past planting and cultivation of palms, dye plants and other useful trees in gardens close to homesteads in the Kavango East region and explore whether this could be further promoted.

Background

The Omba Arts Trust (OAT) has consistently invested in the development of craft in the Kavango East region since 1992, particularly basketry, previously through the Rossing Foundation (RF) Craft Development Programme that evolved into the Omba Arts Trust, which was registered in 2004.

OAT is a member of NACSO (Namibia Association for CBNRM Support Organisation) and WFTO (World Fair Trade Organisation). OAT therefore supports the sustainabile utilization of natural resources, core principles of both NACSO and WFTO. OAT was a CBNRM pioneer in the craft sector, developing homestead palm-gardens from April 1995 to December 1997 (under RF) and in 2015 and 2016 (OAT), supplying palm and dye trees to weavers who attended workshops on crafts-making and sustainable use of resources.

From 1994 to date OAT has facilitated many upgrading basketry workshops and implemented systems that address pricing, grading and a supply chain to OAT in Windhoek, where the bulk of baskets are marketed, contributing significantly to the livelhoods of women in the region. The baskets are much sought after and are some of the finest coming out of the Africa. OAT has also implemented other initiatives that focus on the socio-economic challenges of the weaving communities like the "Lighting of Women's Lives" project where access to solar lighting for members of the weaving communities is facilitated in areas where there is no electricity.

OAT is committed to this partnership with weavers in Kavango East. Based on the knowledge and experience gained, OAT could expand to Kavango West in the future.

Intermittent assessments since 1994, have indicated that weaver's access to Makalani palm *Hyphaene petersiana* leaves for basketry is logistically difficult, particularly in the Shankara catchment area. Harvesting palm can involve days walking to the areas where it grows abundantly. In addition, weavers need to source natural dye materials, collect water and firewood to boil and prepare the palm leaves for weaving.

To assist the weavers and protect the natural resources (NR), it was decided to establish homestead palm gardens from 1994 to 2016. These gardens included dye and useful trees such as Birdplum / Ukerete *Berchemia discolour* as there was concern that excessive use of *Berchemia* bark as a dye resource was damaging the trees (Mendelsohn J & el Obeid S 2005. Forests and Woodlands of Namibia. Directorate of Forestry, RAISON: pg 130). Later community-based research (CBR) has in fact shown weavers preferred the shedding bark near the base of the tree (root bark) as it has a better colour. Basketry, therefore, does not in fact have a major impact on the trees; debarking for medicinal use appears to be more damaging.

The following palm and dye planting initiatives were undertaken:

1. November 1994:
    a. A palm and *Berchemia* planting trial was done at RF/SP, which was successful.
2. 1995 to 1997:
    a. 22 homestead palm gardens were established
    b. 450 useful tree saplings and 2,300 palm-nuts were planted.
    c. This included 500 palms planted in 3 hectares of land in the southwest corner of Shankara and 20 *Berchemia* trees on land north of the gravel road.
3. 2015 & 2016:

    During OAT workshops that included NRM training, an additional 3 palms & *Berchemia* gardens were developed, when participants were given 450 palm-nuts and 10 trees to plant without supervision.

From November 1994 to December 2015, therefore, a total of 2,650 palms and 460 other trees (mainly species used for dyes) were planted in a total of 24 palm gardens. There has, however, been no formal follow up and assessment of these gardens or the dye trees.

Fluctuations in basket production are caused by seasonal rainfall patterns; in times of drought weavers produce more baskets to mitigate against the effects of crop failure and during good rains fewer baskets are produced as weavers are working in their fields. OAT has observed a decline recently in the supply of baskets and weavers continue to report increasing difficulty in accessing palm and some dye resources. The decline in production could possibly be due to other selling opportuntiies in the region and/or seasonal job opportunies for the weavers, although OAT has no access to the records of alternative buyers nor the number of weavers finding job opportunties elsewhere to verify this. The reality is that many more weavers are producing baskets more frequently throughout the year since 1994.

As a result of the above findings, the Omba Arts Trust commissioned a quantitative assessment of palm sustainability in two phases:

1. **Phase 1**: A Palm and Dye Tree Survey from December 2017 to January 2018. This incuded:
    a. An investigation into the status of the available palms and the causative factors for the perceived decline in both palm availability and basket production.
    b. An evaluation of the homestead palm gardens that were established from 1994 to 2016.
    c. Based on the above, the planning of further gardens for implementation in Phase 2.

2. **Phase 2:** Based on information gained in Phase 1**:**
    a. Five Communal palm plots that included *Berchemia* trees were developed in January and February 2018 with a total of 1,200 palm-nuts and 42 *Berchemia* trees successfully planted.

These palm gardens should improve and increase access to NR in the future, ensuring the continued sustainable use and the rejuvenation of the resources used. These strategies should contribute to improving sustainability and enable the continuation of this essential livelihood for the weavers in the Kavango East well into the future, which would also be beneficial for the overall basket sector in Namibia. Data from the Kavango East experience would also provide a base-line should OAT implement basket weaving on a commercial basis in the Kavango West region.

2. METHODOLOGY

1. Phase 1:

2.1.1. A questionnaire interview with basket groups and individual weavers was conducted. The information was recorded and used to guide phase 2 – the implementation of additional palm plots in 2018.

2.1.2. The palm gardens planted between 1994 and 2016 were visited, photographed, the number of palm and other trees counted, the resources assessed as to whether they were suitable for harvesting or not, if not - why not, and if weavers were using them to make baskets to sell.

2. Main Outcomes:

2.2.1. **Phase 1:** The survey was done from November to mid-December 2017. Eighty-one (81) people in total were interviewed: 78 weavers and 3 men.

2.2.2. **Phase 2:** Palm gardens were established from January to end of February 2018.

3. FINDINGS PHASE 1

3.1 Palm and Dye Resource

3.1.1. There is evidence of increased stress on natural wild palms due to growing human settlement in the areas where they are traditionally harvested, particularly around inland boreholes, new gravel roads, schools, clinics and cuca shops.

3.1.2. Weavers confirmed that they must go further and deeper into the bush to find suitable palms.

3.1.3. Palm leaves today have added-value and are a frequently traded commodity being harvested in traditional areas by non-weavers who sell it to weavers living 20 to 80 kms away.

3.1.4. The collection and sales of palm leaves is evolving into another livelihood with prices for prepared palm ranging from N$20 to N$50 per bag, standardised on a 10 kg maize bag.

3.1.5. The monetary value attached to palm harvesting is resulting in some weavers losing the basic rights to these resources which were once freely available to them, their mothers, and grandmothers, throughout the region.

3.1.6. When weavers from outside an area go to harvest the palm leaves, they are increasingly expected to pay the Village Development Committee (VDC) or local headman. This does not extend to resident weavers who are local – they can harvest palms free-of-charge.

3.1.7. Some weavers living alongside the Okavango (Kavango) River cross over the border and harvest in Angola. They risk being arrested and having their palm and dye material confiscated and handed over to the Namibian border police.

3.1.8. Crushed dye resources as well as dyed palm leaves are bartered, exchanged and sold at N$5 per cup and N$10 per small bundle of pre-dyed palm respectively.

3.2 Assessment of Palm Gardens and Recommendations

3.2.1 The homestead gardens proved successful regarding germination and growth of palm, *Berchemia* and other useful trees that were planted.

3.2.2 Not all the gardens were effectively benefitting the original weavers as much as hoped due to socio-economic factors and the relocation of weavers as their circumstances changed or they passed away.

3.3 Strategic Actions Based on Findings:

3.3.1 It is recommended that palms and dye trees should be planted closer to where weavers and groups of weavers live.

This would allow weavers to protect and manage the resource and give them fee access to the palm fronds.

3.3.2 It is recommended that communal palm plots should be developed in future, instead of homestead plots. Selected weaver groups could manage "their" plot collectively and have free access to harvesting the palm leaves.

4 ACTIVITIES PHASE 2

4.1 1,300 palm-nuts and 50 dye trees were purchased; six communal palm and tree plots and three communal dye tree-only sites were identified.

4.2 Palms and trees were to be planted in 6 plots serving 5 weaver groups, however, the 6th plot was not completed within the timeframe.

4.3 Supervised planting of 1,200 palm-nuts and 32 dye trees in five location took place. Ten trees were planted in three tree-only areas, making up a total of 42 trees.

4.4 The 100 palm-nuts for the 6th communal plot have been retained to be planted during the next rainy season.

5 COMMUNITY BASED RESEARCH OUTCOMES

5.1 Eight research plots were established in the KORO/Mbremba Pan area in 1996. Harvesting methods and differing levels of protection were tested at each plot. The data were collected four times a year from 1996 to 1999 with the core basket group. This was a community-based research study to trial different harvesting methods and the impacts on palm with group participation. It provided a practical training tool for the weavers to gain a better understanding about the best harvesting methods.

5.2 The research plots were located at one of the weaver's homesteads in the area, which is now abandoned, making it difficult to find exact locations as no fences remain. However the palm was found and there was evidence that it is still being used by weavers.

5.3 The plant's response to the interventions applied was recorded for each plot, i.e. the condition and number of fronds produced over a 3-year period every 3 months. The basket group who participated did the interventions and assisted in the recording.

6 SOLUTIONS AND ACTIONS IMPLEMENTED

6.1 Weaver groups chose to enter into an agreement with their VDC and/or headman to establish palm plots in a similar manner to how fields for maize and mahango are allocated. These plots then will be managed by the weaver groups.

6.2 Plots were not fenced as Ministry of Land Reform (MLR) and the CLB are against fencing. Fencing indicates ownership of communal land, which requires CLB approval and might involve applying for a right of leasehold. In addition, fencing is currently a controversial issue in communal areas.

6.3 With mentoring, the weaver groups will manage and control their own plots. The groups have registered the names of members of the group and agreed on a process similar to a constitution.

6.4 These group then by agreement will co-manage the palm plots and the harvesting rights. The aim is to empower the weavers to manage and control the plots themselves. In this way it should protect the harvesting rights and benefits for registered members and new members in the future.

6.5 Six communal craft garden areas were identified geographically close to the residences of the respective weaver groups. Five gardens were planted, and the sixth garden will be planted during the next rainy season.

6.6 Palm nuts were sourced and purchased from the Grootfontien area and the dye trees from the Rundu Directorate of Forestry.

6.7 Of the 1,300 palm nuts purchased, 1,200 were sowed directly in the lands and left for rainfall to germinate.

6.8 Forty-two dye trees were planted.

7 RECOMMENDATIONS

7.1 That both the weavers and OAT monitor the plots and trees during 2018. A more formal evaluation towards the end of 2019 is recommended. The evaluation would record survival and growth data and make further recommendations.

7.2 That OAT continues their proactive training and development programme in the region.

7.3 A 2-page document with photos relevant to each group has been produced, and each group will be given a folder in which to keep their information, which should be updated from time to time.

7.4 That this report be distributed to the TA and the 2 RC offices by Omba Arts Trust to keep community leadership informed. This will foster an improved understanding of OAT's work in the Kavango region, sustainable NR management and encourage local support of the basket programme.

7.5 That the occupant of Shankara be approached by Omba Arts Trust to allow weavers to harvest palm planted in 1995/6 on the land south of Shankara.

7.6 That a one-page information leaflet / poster be prepared on basket making in the Kavango, and specifically on how to plant and manage Makalani palms and *Berchemia* dye trees for sustainable production.

7.7 That an outreach programme with local schools and lodges be initiated to encourage and support them (using the information leaflet / poster) to start palm and other useful tree gardens.

8 CONCLUSION

Phase 1:

The Survey proved that planting palm, dye and other useful trees can be successfully done in the Kavango East region. Increased settlement in the areas where palm is harvested has put the resource under pressure making it more difficult for weavers to access. Access to sufficient natural plant resources is essential for basket makers to make sufficient baskets of suitable quality to meet the demand and optimise their income. Supply of baskets is affected both by weavers relocating to other areas where they get full time or seasonal employment and due to changes in their circumstances. An increase in other customers and selling opportuntiis for weavesr is also impacting on the supply of baskets to OAT. When weavers relocate elsewhere, their homestead gardens become available to new residents. Exclusive homestead gardens allow relatively few weavers to benefit from the palm resource. Also, the planted palms on Shankara land are currently not accessible to weavers.

Palm and dye resources are exchanged between weavers and are traded or bartered by non-weavers as an additional livelihood. However, this means that weavers have to pay for the raw materials, resulting in baskets costing more to make and lower profits. Palm now has a monetary value, similar to reeds, wood poles, wood planks and thatch grass. This has changed how palm is perceived by local VDC and/or Headman who now expect non-locals to pay for the right to harvest. The old accepted traditional way of harvesting is changing and weavers have had to adapt to these changes.

Phase 2:

For the above reasons, a strategic decision was made, in consultations with the weavers, to establish bigger and more accessible community palm plots rather than more homestead gardens. These communal plots will be "owned" and managed by the basket group of each respective area, similar to forming a working committee/group, where members are registered. To this end 1,300 palm nuts and 50 *Berchemia* trees were procured, of which 1,200 nuts and 42 trees were successfully planted, in five of the six identified community gardens. An additional three areas were identified for planting dye trees only as there are already palms growing there. On the completion of Phase 2, flip-file folders were prepared and distributed to each

group, and an abridged version of this report will be presented to the RC and TA by OAT. It is recommended that the newly established palm gardens should be monitored and evaluated over the next few years.

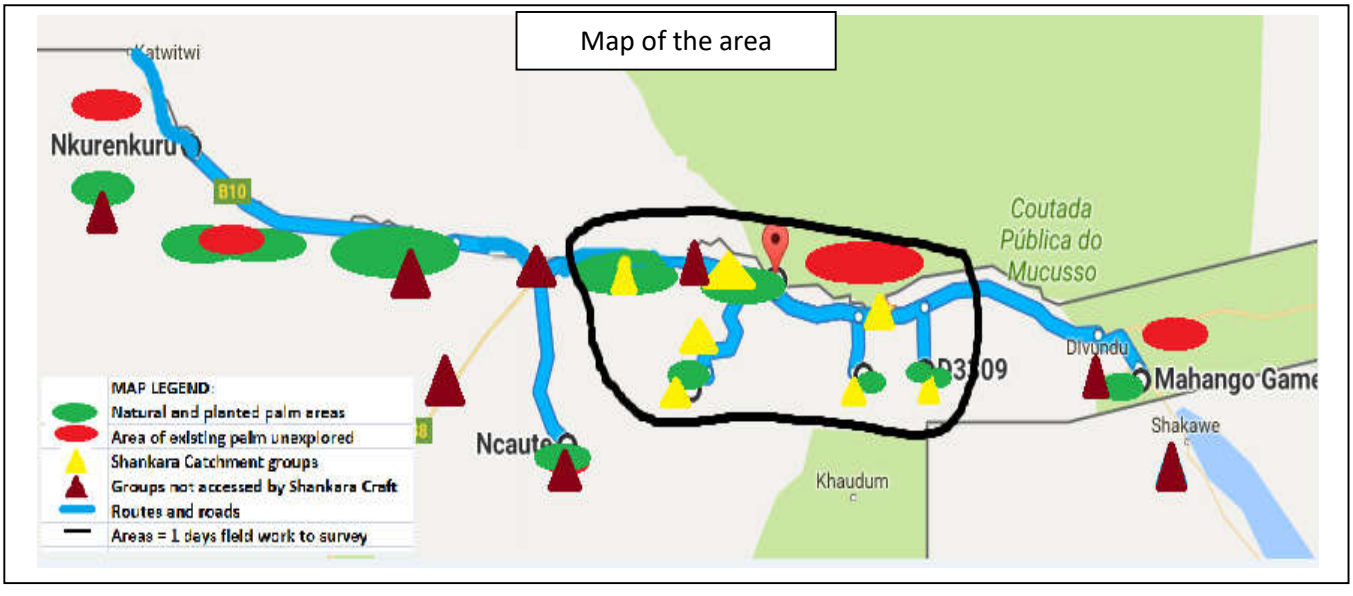
9 ACKNOWLEGEMENTS

Namibian Chamber of Environment, B2Gold Namibia and Total Namibia for funding this project. Omba Arts Trust for initiating, managing and monitoring the survey. The Giriku Traditional Authority and the Regional Council at Ndiyona and Ndonga linene for their ongoing support. The NGOs IRDNC, NNF, ERP, WWF & RF for their support. Basket weavers for their enthusiasm and participation, Kristina and Kornelia for there facilitation and interpretation, and Dr Tony Cunningham, Dr Beth Terry and Annie Symonds for information. The Rundu Directorate of Forestry for supplying the trees, Sally Khaeler for sourcing the palm-nuts, the Ackerman's for assisting with transport for the palm-nuts, Shamvura Camp for logistical support and MLR and KeCLB for advice on fencing.

10 ANNEXES

Annex 1: Map of the project area
Annex 2: Table of Meetings
Annex 3: Assessment of previous gardens
Annex 4: Photographs of planting in new (2018) gardens
Annex 5: Results of Palm and Tree planting 1995/1997 – 2016.

ANNEX 1: Map of the Project Area



ANNEX 2: Table of Meetings

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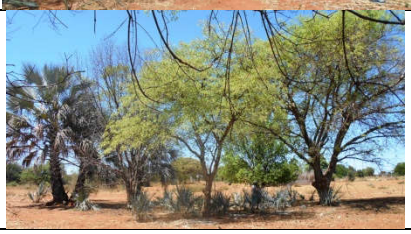
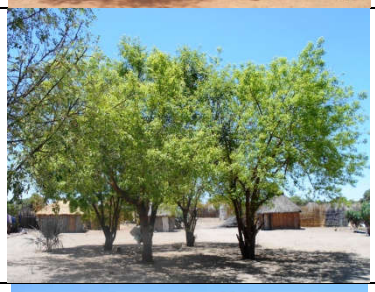
Photo or map	Name	Problem needs identified	Way forward
	Kashira-Sharuwanda	Women harvest palm in Angola, if they get caught, are arrested handed over to Namibian border police and get punishment duty, palm is confiscated	Keen to have a communal palm garden are confident it's possible. They can manage similar to communal veggie gardens and bakeries with a committee. ± Half of this group sell to FAWENA and Kayova River Lodge, although sales to Kayova are sporadic and not paid cash up front?
	Makandu	Women harvest at Koro and as far as Lileria as increased settlement, livestock, harvesting pressure, reduced available palm at KORO. Palm is confiscated, and local headman want payment	Would like a communal palm garden. Are in process of meeting TA/VDC to resolve palm confiscation & payment. Do not sell to anyone else, although one time they did sell to another person
	Muduva Nyangana,	Struggle to find palm, risks such as elephants, which damaged the palm and trees they planted. Distance to get baskets to selling point at Kashira difficult 2 visits the second to speak to the basket weavers, but representation of whole group (quorum) not found. Intend to carry interview and palm site visit over to phase 2	Were given 200 palm nuts and 4 Berchemia trees in 2015, have 98 palms growing north east of the Livayi school, in the omaramba and 3 trees growing at the school where they have water. Would like own palm garden, need suitable location, fencing that deters elephants. They have sold to FAWENA and through Namibia Exclusive Safaris to hunters.

	Shankara group	This group the founder group has dwindled to small core group and consider themselves now separate from Ndonga Linene	The group sell directly to Christina, there is no alternative market and they struggle to get palms, they buy from Koro and Ngone. They are not accessing the Shankara project palms. They feel they have first rights to the projects palm and trees but sadly it has already been given to the communal farmers?
	Manager Shankara Project Terence Spyron	Interviewed particularly in relation to weavers having access to the palm plantation and trees.	This revolves around a land dispute and while on a personal level the manager of the project has no objection to the weavers harvesting on the land, he would like to be informed or asked and possibly receive some compensation, even if it is nominal
 	Ngone	This area has a lot of palm, however they have no *Berchemia* trees	The group have easy and free access to palm, feel justified that outsiders should pay the TA for palm, they themselves do not sell palm, but relatives of weavers outside who live at Ngone harvest and sell? They would appreciate Berchemia trees which they would plant near water but in locations that enable weaver access. Pricing and grading their main concern. They sell to the nun at Shambyu, no other frequent or regular buyers?

We have not documented the number of palm fronds it takes to make an average sized (35cm) basket. A regularly harvested palm produces about nine fronds a year and a palm not pruned regularly in the wild produces about three fronds per year. Once we have established the number of fronds it takes to create a 35 cm basket it will be possible to estimate the number of baskets that can be produced from 1,000 palms; and the number of palm trees that should be propagated to meet the basketry demands without harvesting from wild palm trees. Palm fronds produced is also influenced by rainfall both quantity and seasonality, and other stress factors such as fire, and browsing by elephants.

ANNEX 3: Previous palm and other tree gardens visited and assessed

Photos	Name of weaver	Notes
	Josephine Kunyima	Still alive, lives in Angola, daughter harvests and makes baskets. Trees are utilized. 11 palms, 4 *Berchemia*, 2 marula.
	"Mama", Johanna Katere	Still alive lives Rundu. Daughter harvests and sells to OAT, the second best looking and cared for palm garden and is utilized. 127 palms, 4 *Berchemia*, 2 marula.
	Maria-Hilda Mashova	Still alive, was not cared for palms grew too big to harvest, daughter harvests some, a neglected plot, reasons for lack of harvest linked mainly to movement of residents, change in ownership and increased value in palm, making it a commodity to sell, with the weavers who planted the palm and moved resenting or refusing to pay for palm she planted. Is partially utilized. 21 harvestable palms + 13 too big to harvest = 33 palms. 1 *Berchemia*, 1 mangetti & 2 marula.
	Christina Shitoka	By far the best most well used and kept palm garden. Is utilized. 155 palms all harvestable. 4 *Berchemia*, 2 marula, 1 African wattle. On riverside here are 46 randomly planted harvestable palms.
	*Berchemia* "forest" just west of Shankara project on the river bank, below gravel pit	1995 two adult *Berchemia* trees that women harvested for dye, (only mature trees are suitable), & medicinal purposes. These two trees are old huge & still heavily harvested yet are thriving. Unable to count all the medium, young trees and saplings estimate the forest has grown to have ± 26 trees, maybe more.

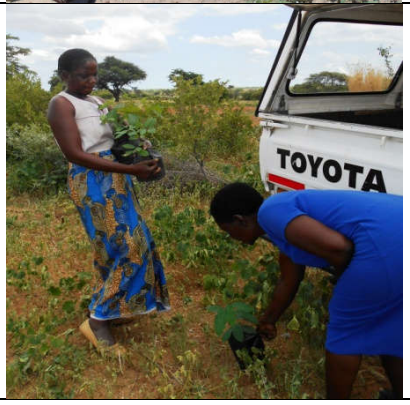
	Lydia Kashivi	Is not utilised and Lydia no longer lives in the area. 6 palms, 1 marula, 3 *Berchemia*, 1 African wattle.
	Linyando Mukwahepo	Soil not considered good for palms here, however the 4 *Berchemia* trees are thriving, provide good shade and the berries are eaten. Only 4 scraggly palms counted.
	Adelina Mukiri	Adelina moved to Makandu garden Not utilized 2 large unharvestable & 8 small harvestable = 10 total palms. 4 *Berchemia* trees.
	Reginaldo Mbamba	No palms found, Reginaldo lives elsewhere, closer to the clinic, only 4 healthy *Berchemia* trees, 1 marula found and possibly this stunning mangetti tree in the photo.
	Astrid Muranda	Soil not considered good for palms, however the 5 palms found although small one was being used. 2 healthy *Berchemia* + 2 small scraggly *Berchemia* = 4 in total. 1 marula and 1 blue-gum *(unfortunately funds from Australia-aid, donated invasive blue-gums).*
	Philomeno Mudi	Deceased, palm garden is disused, but healthy with thriving trees and harvestable palm, the only successful planting of a Kiaat tree which although being harvested for medicinal use, is thriving. 27 palms mostly too big to harvest. 6 *Berchemia*, 1 African wattle, 2 marula, 2 blue gums (sigh Aussies), 2 guavas (DoF).
	Christina Rudiru	No longer resident with neglected overgrown palms. 47 palms most too big to use. 6 *Berchemia*, 3 marula.

	Ephemia Mununga	No longer is resident but garden utilized by mother, blue-gum offers wonderful shade. 46 palms, 2 *Berchemia*, 1 marula, 1 blue-gum and they had planted a sausage tree themselves.
	Kristentia Nangura	Deceased and sister may utilize from time to time. Overgrown on southern side away from river, remaining palm harvestable 4 big palm + 49 smaller harvestable palm = 53 total. 1 *Berchemia*, 2 marula, 2 guavas.
	Christina Manunga	Is utilized palm looks healthy as do the *Berchemia* trees 66 palms 5 *Berchemia*, 2 marula The last 3 gardens are close together on river edge.
	Agnes Muhako 1	Although palm is utilized, it no longer "belongs" to Agnes, a dispute with the closest homestead caused her to abandon it. 81 healthy harvestable palms, but no other trees.
	Agnes Muhako 2	Second attempt also abandoned, and a homestead is built on part of it now, the *Berchemia* trees provide shade, there was only 1 palm, 2 marula, 2 *Berchemia*.
	Bernadetha Mpareka	Nothing could be found that may have resulted from the palm garden, there is a lodge (Marumba Lodge) built here! Tall old palms exist indicating it may have been a good location for palms.
	Vihemba Kalipa	No longer resident but garden is being utilized 26 palms, 3 *Berchemia*, 3 marula, 1 African wattle. Some old established palms nearby.
	Shikenge earliest recorded palm planted	Approximately 150 palms will need proper recounting; these were planted by a mother for her son's vehicle as a driveway in the 1980's. Palms are utilized, some are now too big to use. Although not part of this survey, more investigation needs to capture the history of these palms.

	Innocentia Mulimbura	Non-resident works at Noordover, garden neglected and occasionally used. 27 palms, 2 *Berchemia*, 2 marula, 1 blue gum, 1 African wattle and 1 silver leaf terminalia.
	Paulina Mukiri	Deceased, is being utilized, was neglected 11 palms, 1 marula.
	Shankara project palm garden	Of the 500 palms planted here, 493 (99%) germinated of which at least 60% are harvestable
	Shindough, This group has its own buyer and is combined with Koro	Initially the headman/VDC for Koro/Lileria wanted them to pay the VDC, however they successfully negotiated that they are part of Koro and should be considered as close enough to harvest palm. They have some palm growing in their area and while no promise was made would like a communal palm garden, with *Berchemia* trees. They complained about pricing and grading.
	Koro, Group resident in palm belt, part of Shindough group	Obviously, no problem harvesting palm although due to development around the Koro water point and school, they also have to go further to harvest to Mbrema pan and also sometimes as far as Lileria, they have no Berchemia trees although one did grow that was planted at Mbrema pan. They agree that outsiders should pay the VDC for harvesting palm, they do not get the money, and it goes towards meeting that the VDC hold. They buy *Berchemia* @ N$30 per kg, would like to have *Berchemia* trees planted near water. They raised the issue of pricing and grading.

 	Kornelia Sikindo In George Muyoka Conservancy	Very active group although there is a breakaway group that sells to FAWENA. The Headwoman participated in the meeting. Although there were concerns about pricing and grading this is a productive group with their own buyer. They have planted palms and *Berchemia* trees of which 23 palms and 2 of the 4 trees were counted.
	Mabushe Group no longer makes commercial baskets	The palm garden is harvested annually by the few remaining producers who make baskets for harvesting and winnowing. No *Berchemia* trees survived however 87 palm out of 100 have germinated and survived. They cited that their now deceased leader of the basket group initiated selling to FAWENA, then left to work at Noordover before passing away, the group has not reformed.

ANNEX 4: Photos of planting palms and dye trees in the new communal gardens

		1. Sharuwanda / Kashira; (200 palms and 4 *Berchemia* trees were planted),
		2. Shankara; (200 palms / 4 *Berchemia* trees).

		3. Makandu; (200 palms / 4 *Berchemia* trees).
		4. Shindough; (100 palms / 8 *Berchemia* trees).
		**5.** Kandjara (George Mukoya Conservancy); (200 palms / 6 *Berchemia* trees)
		**6.** Livayi (Muduva Nyangana Conservancy); (100 palms / 6 *Berchemia* trees were arranged to be sent down for planting without supervision. (photos are of Christina counting their palms. The child with a tree is from Shindough.

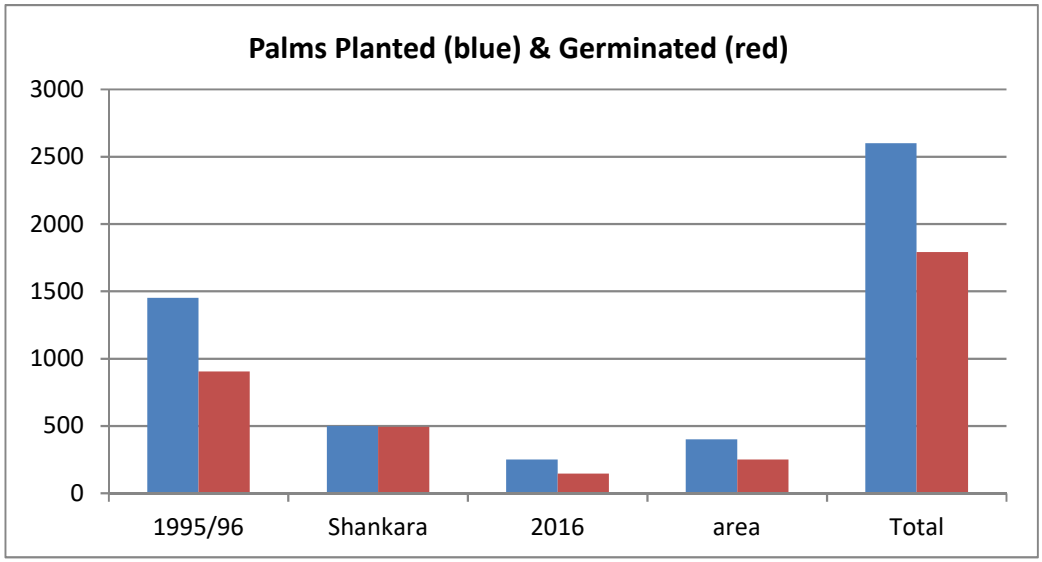
Palms not planted		7. Koro; 8 *Berchemia* trees planted
Palms not planted		8. Ngone; 8 *Berchemia* trees planted

APPENDIX 5: Results of palm and other tree species planted in 1995/97 to 2016

a) **Palms**

- From 1995 to 1997: 22 homestead palm gardens were established with palm-nuts, dye and other useful trees. Garden**s** were fenced, and all the planting and fencing was done under supervision.
- The number of palm-nuts planted per palm **g**arden ranged from 20 to 100, depending on plot size,
  - 1,950 palm-nuts were planted (including 500 for Shankara Project)
  - 1,297 germinated (including 493 for Shankara Project)
- In 2015 & 2016, (following a workshop) 3 additional gardens were added
  - 450 palm-nuts were planted
  - 246 germinated
- 1,543 of recorded palms germinated
- In the late 1980's an estimated 400 palms were planted to demarcate a driveway to a homestead by a local women in the community. Of these at least 250 survived and are used by weavers.
- Therefore, the palms planted and monitored from the late 1980's, then from 1995 to 2016 total:
  - 2,650 planted including the driveway palms planted in the 1980's

- ±1,893 (71%) germinated, including the driveway palms planted in the 1980's
- From 1995 to 1997 & 2016, a total of 164 *Berchemia* and 320 other trees were planted in palm gardens totalling 486.

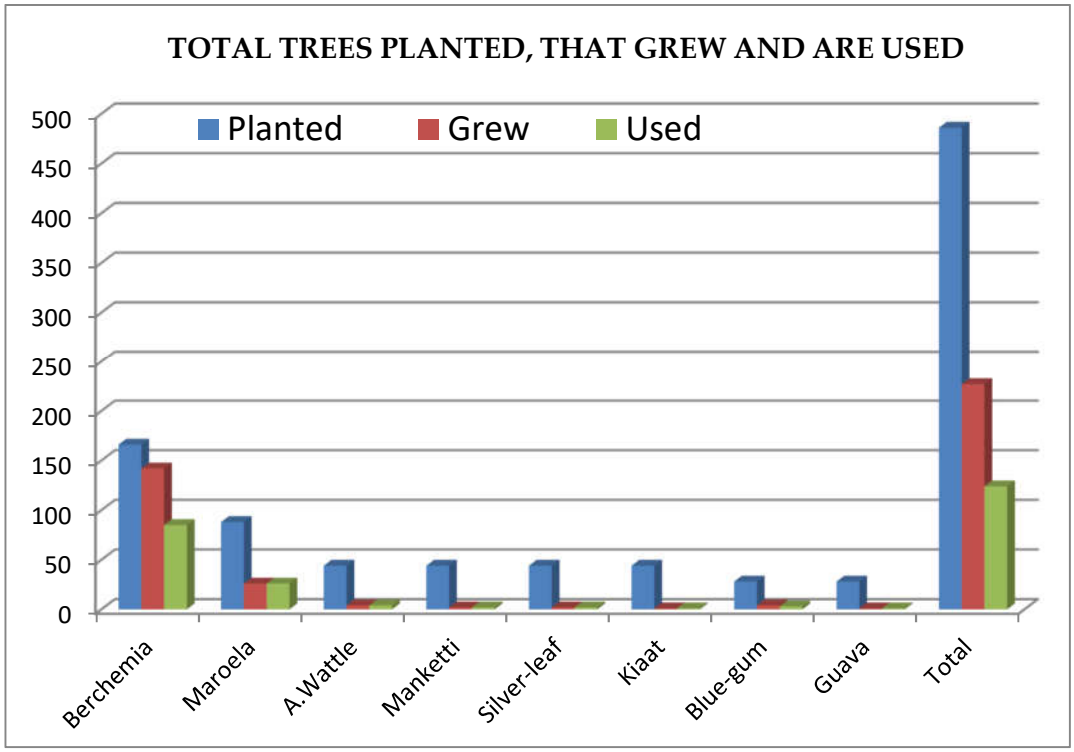


b) Other Tree species Survival: 1995 to 2015

- 96 *Berchemia* trees (60% of those planted) and 31 other useful trees (10%) of those planted are being utilized - as a dye resource, food, medicinal and for shade. After 20 years the trees have been subjected to a range of use, removal and abuse. The marula and *Berchemi*a trees were successful, but only 1 blood wood (kiaat) tree grew.
- The wild *Berchemia* trees just west of Shankara close to the river have increased from two mature trees in 1995 to six large, 11 medium, 14 young trees and at least 15 saplings. A total of 46 were counted, the small "forest" is overgrown and difficult to count accurately. There was evidence that they are regularly harvested for both basketry and medicinal purposes.

TREES PLANTED AND GREW FROM 1995 TO 2016						
1995/97	**22 Gardens**	**Koro**	**Shankara**	**Ber. Forest**	**2015/16**	**Total**
Berchemia	130	4	20	2	10	166
Marula	88					
African Wattle	44					
Mangetti	44					
Silver-leaf Terminalia	44					
Kiaat	44					
Blue-gum	28					
Guava	28					
Total	**450**	**4**	**20**	**2**	**10**	**486**

TREES PLANTED FROM 1995 TO 2016 STILL GROWING						
2017	**22 Gardens**	**Koro**	**Shankara**	**Ber Forest**	**2016**	**Total**
Berchemia	70	2	16	46	8	142
MarUla	26					
African Wattle	4					
Mangetti	2					
Silver-leaf Terminalia	2					
Kiaat	1					
Blue-gum	4					
Guava	1					
Total	**142**	**2**	**16**	**46**	**8**	**214**



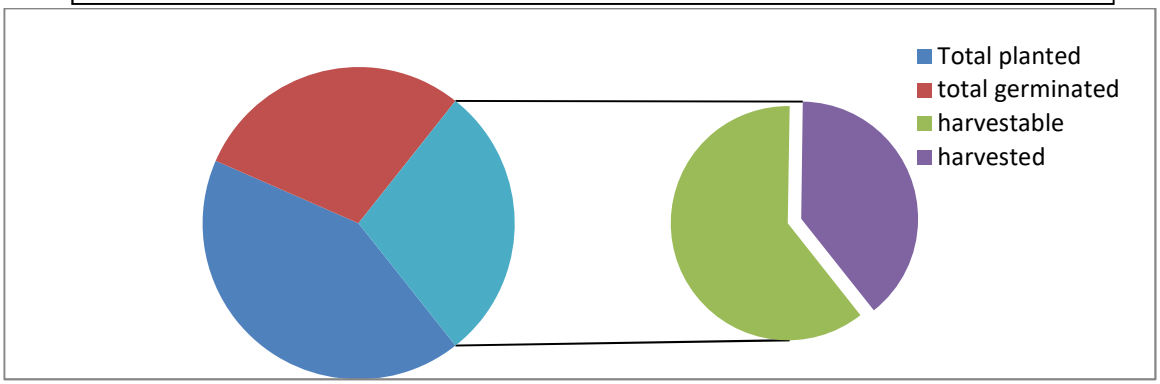
c) **ANALYSIS OF THE RESULTS**

- ± 50% of the growing palms are un-harvestable as they are either too small, too tall, neglected, or damaged, e.g. ploughed over.
- ± 50% of the planted palms are suitable for harvesting but only ± 20% are being used.
- Weavers do not have access to Shankara palm as permission needs to be arranged.
- It was noted that Shikenge palms planted before 1995 were being harvested.
- Trees planted:
  - ± 70% the all the other useful trees are used for dyes, medicinal, food and shade, including the blue-gums for shade.

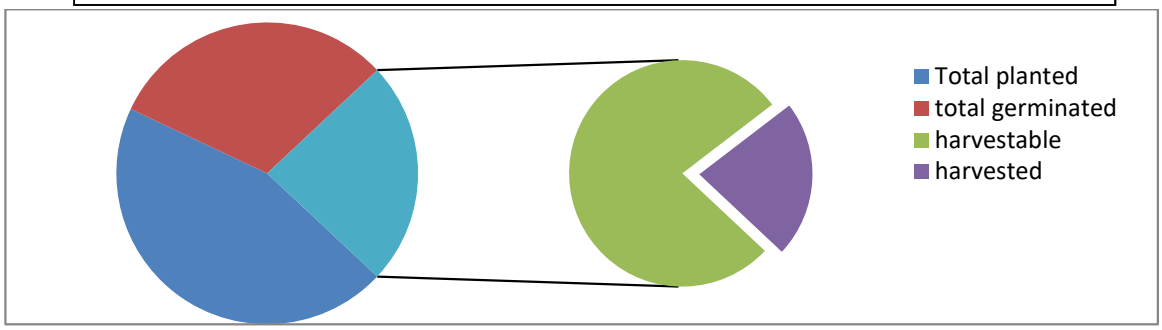
- ± 60% of the *Berchemia* trees, including those in the wild forest, were being used for palm dying.
- ± 80% of the *Berchemia* trees, including the wild forest, were being for dye, food & medicine.
- No trees are used at Shankara, these are planted on the (riverside) of the road along the driveway. This is a privately managed place and permission needs be arranged with the manager for weavers to have access.

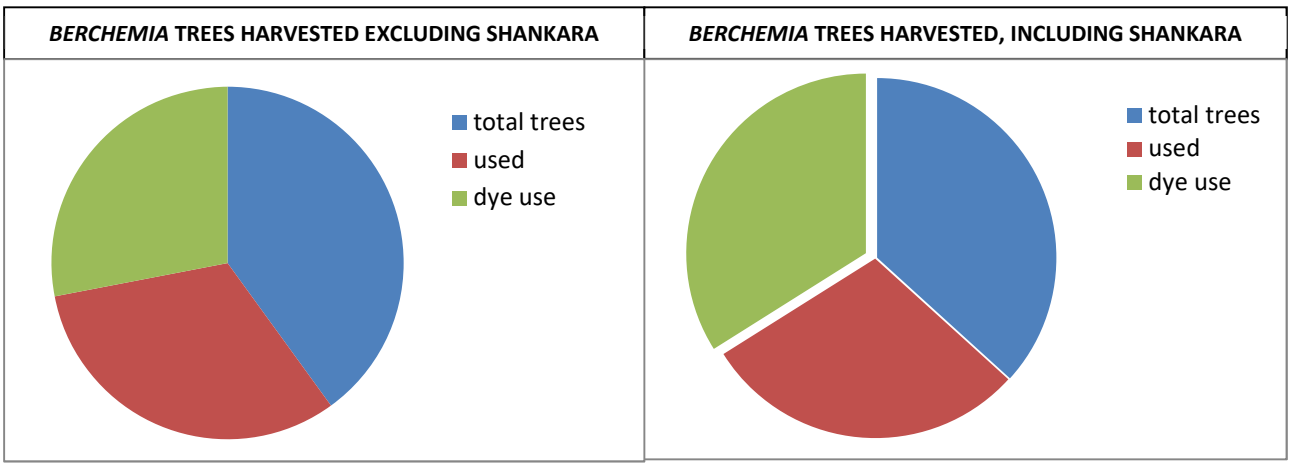
- The Shankara wild *Berchemia* "forest" west of Shankara on communal land is thriving even though the trees are being utilized. The "forest" is dense and it was difficult to count accurately.
- As shown by the charts above & below if the weavers are able to access Shankara Palm and trees, it will increase the amount of palm available to harvest and be of benefit to them.

ALL PALM AVAILABLE FOR HARVESTING BUT WITH ACCESS TO SHANKARA



ALL PALM AVAILABLE FOR HARVESTING WITH SHANKARA NOT HARVESTED





d) COMMUNITY BASED RESEARCH OUTCOMES:

a) Eight research plots were established in the KORO/Mbremba Pan area in 1996, each tested a different harvesting method and differing levels of protection. The data was collected 4 times a year from 1996 to 1999 with the core basket group. This was community-based research to trial different harvesting methods and the impacts on palm with group participation. This is a practical training tool for the weavers to gain understanding about the best harvesting methods to use.

b) The research plots were located at one of the weaver's homesteads living in the area, which is now abandoned making it difficult to find exact locations as no fences remained. However, the palms were found and there is evidence that they are still being used by weavers.

c) The plants response to the interventions applied was recorded for each plot, i.e. the condition and number of fronds produced over a 3-year period every 3 months. The basket group who participated did the interventions and assisted in the recording.

e) RESULTS

Results: Palm Trees

- An untouched palm tree producers about 3 fronds a year.
- When pruned (leaves harvested every 3 months), about 9 fronds are produced per year.
- Palm trees can withstand some abuse and recover, including, ploughing, grazing, trampling, browsing, vehicle damage, fire and harvesting with an axe into the palm heart.
- However, if heavily utilized in a continuously abusive manner, the palms did not rejuvenate fully, and some die-off occurred, e.g. where they were deeply dug-out with the core/heart burnt, or covered due to building construction.

- Trees that were ploughed through annually, driven-over on the tracks and/or continuously trampled by livestock, suffered and while they did not grow well, most survived.
- When harsh harvesting methods were applied that deeply expose the palm heart, 2 out of 4 trees showed damage with core die off, whilst there was sprouting and re-growth of young palms around the edges.
- This was surprising because palm trees do not have a rhizome, (like grass) that puts out runners with roots developing along the runner creating new plants. Palm trees have a single long tap root that feeds a single tree trunk. Information found in publications indicates that if any part of the tap root survives beneath the damaged core, new young fronds are pushed up and the tree continues to grow on the outer edge of the core.
- This is a new finding and further scientifically-based research is required.
- In the 25 plots it was confirmed that palm-nuts germinate well when just planted in a shallow hole, protected against termites with a sprinkling of "blue-death" or ash; and then left to natural rainfall to germinate. Some palms germinated 1, 2, 3 and 4 years after planting, indicating that some nuts lie dormant for several years.
- Some of the palm gardens produced harvestable palm within 3 to 5 years. While some of the germinated palms never grew big enough to be harvested, some palm grew so well in 20 years, that they were too tall to harvest.
- This aspect could be further researched and would require soil testing and specific rainfall capture in order to establish the best location to plant palm-nuts to produce suitable fronds for basketry.
- Location, soils and water capture influence germination and growth.
- Palms that were planted and germinated in large pots, did not transplant successfully. As soon as the root was exposed to light during transplant, the plant died.
- In addition, the small growing leaf above the soil is supported by a very strong, long deep tap root. When planted in a pot this root has nowhere to go and curls around on top of itself at the bottom of the pot, or cracks the pot as it tries to push through the bottom of the pot.

Results: Dye Trees and *Berchemia*

- *Berchemia* trees transplant and grow well as long as they are watered in the hot dry season until they are strong enough to survive without water.
- Of all the trees planted 86% survived of which 60% are being utilized for dye, food and medicinal purposes.

Results at Shankara

- There is currently no agreement in place that allows for weavers to access 16 healthy trees on the riverside of the road, or the 493 palms (in the south west corner south of the road) at Shankara.
- At least 60% of the palms and all the dye trees at Shankara are suitable for harvesting.
- Shankara palm was planted in 1995 and 1996 before the new private management and community vegetable gardens were established. It was suggested to the weavers that they approach the Ndonga linene RC, TA and VDC to request for "first rights" to access the Shankara palms.
- There is also an exchange of palm and dye material between the riparian and inland weavers. This is mainly for *Berchemia* harvested closer to the river and *Indigofera tinctoria* (true indigo – a purple, mauve dye) harvested in Angola. This exchange and barter is potentially a good practice as it facilitates weavers helping each other.

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