



PLANT RESOURCES & MONITORING

Follow up report & recommendations on further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia.



A report for the Integrated Community Ecosystem Management (ICEMA)/French Fund for Global Environment (FFEM) Project

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EXECUTIVE SUMMARY

In May 2007, a detailed report to the Integrated Community Ecosystem Management (ICEMA)/Fonds Français pour l'Environnement Mondial¹ (FFEM) project made 46 recommendations for further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia². This report, produced a year later, reviews progress with those recommendations and suggests an Activity Plan for HVPS to 2010.

Over the past year, it is encouraging that progress has been made on a fair number of the recommendations made in 2007, with partial or on-going progress with others. A significant number of recommendations have not been followed up at all, despite the widespread that they dealt with important issues. There appear to be two main reasons for this. Firstly, that the 2007, although available in electronic format and hard copy was not widely distributed, possibly due to confusion between ICEMA and CRIAA-SADC on who was to take responsibility for this process. Secondly, a common problem in Namibia –that of the skills shortage that so often poses a major constraint.

What has helped a great deal over the past year is that the ICEMA/FFEM project has benefited from the arrival of Peggy Poncelet (Junior Professional Officer (Plants), ICEMA project), who has been strategically placed at the NBRI, and with guidance from Pierre du Plessis, has followed up on a number of the recommendations in the field. Recommendations arising from this review and recent meetings and field visits are:

- For ICEMA to distribute this report and the more detailed (2007) report more widely, following up on recommendations given in Table 1;
- Closer coordination between management planning and monitoring in Communal Conservancies (CC's) and Community Forests (CF's);
- To implement the proposed Activity Plan for further integration of HVPS into CC and CF in Namibia (Table 5);
- Jointly through the NBRI, IPTT and CRIAA-SADC develop and raise funding for a 5 year training and mentoring programme for applied work linking local people's knowledge and expertise to plant resource use, conservation and management in CC's and CF's so that when the ICEMA/FFEM programme ends in 2010, work to build Namibian capacity in this field continues.

¹ French Fund for Global Environment

² Cunningham, A B. 2007. People, plants & landscapes: a review & recommendations for further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia. Unpublished report to ICEMA/FFEM, Windhoek, Namibia.

1.0 Background

The overall objective of the ICEMA Project is to restore, secure and enhance key ecosystem processes in conservancies in order to reduce land degradation and improve the conservation of globally important biodiversity. The associated development objective is to promote community-based, integrated ecosystem management that results in socio-economic benefits to conservancies. This second objective is an important one both in terms of plant use and for the long-term success of some Communal Conservancies and Community Forests³.

Namibia contains several Important Plant Areas (IPA's) of global importance in addition to areas of national and regional significance, including several that fall outside protected areas and conservancies. Namibia also has an outstanding track record in supporting and developing tourism and wildlife values in communal areas. About 120 000 km² of Namibia and many vegetation types, are covered by 50 registered Communal Conservancies (CCs), with an additional 20 communities in the process of forming additional CC's. More recently, a total of 51 Community Forests have been supported through Finnish and most recently German consultants and international donor funding. Thirteen of these Community Forests (CFs) have been gazetted, with 25 of the total CF's overlapping with Communal Conservancies⁴.

Namibia has an impressive track record of commercialising natural products and has a great opportunity to further integrate plant use, conservation and resource management into CBNRM. The TOR for this report, aimed at furthering this process are given below.

2.0 Terms of reference

- Evaluate what's been done to mainstream plants into CBNRM/CBIEM in the past year;
- Report on progress following recommendations made in the report to ICEMA/FFEM in May 2007, discussing interim developments with key informants;
- Suggest prioritized actions for remainder of the ICEMA/FFEM project, which at this stage, is scheduled to end in 2010;
- Based on above, make recommendations about key plant species to include in Event Book system in each ecological zone and suggest appropriate levels/methods of monitoring for each (including *Harpagophytum* in more detail);
- Recommend applied research on *Ximenia* to support Peggy Poncelet's community-based work on this species in the Kaudhum North complex, followed up by providing ICEMA with the most recent peer-reviewed research papers on methods for assessing annual fruit production in trees and shrubs.
- Recommend training processes and modules to mainstream the plant component. During the field visit, additional advice on *Terminalia sericea* adaptive management was requested. This will be given separately.

³ **Note:** the term "forests" in Namibia can be confusing. Namibia has no true closed canopy forest. Less than 10% of Namibia is covered by tall woodland. However, under the FAO definition of "forest" (vegetation with more than 10% canopy cover and over 5m high) these tall woodlands are sometimes termed "forest". An additional 50% of Namibia is covered by savanna or shorter woodland.

⁴ Sprung, R-D. 2007. Integrating Conservancies and Community Forests. Unpublished progress Report 03/07 – 08/07 to the Namibia Nature Foundation (NNF), Windhoek.

3.0 Progress on recommendations made in the 2007 report to ICEMA/FFEM and Suggest prioritized actions for remainder of the ICEMA/FFEM project (to 2010)

At this stage, the ICEMA/FFEM project is scheduled to end in 2010. In May 2007, a detailed report to the Integrated Community Ecosystem Management (ICEMA)/Fonds Français pour l'Environnement Mondial⁵ (FFEM) project made 46 recommendations for further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia⁶. Table 1 below, produced a year later, reviews progress with those recommendations and suggests an Activity Plan for HVPS to 2010.

Table 1. Summary of progress, follow-up and responsibilities for implementing the 46 recommendations made in 2007.

RECOMMENDATIONS (May 2007)	Progress (Yes/NO/Partial)	SUGGESTED FOLLOW-UP	PRIORITY LEVEL ⁷ (1-4)	WHO NEEDS TO TAKE ACTION?
COMMERCIALIZATION OF HIGH VALUE PLANT SPECIES (HVPS)				
Recommendation #1: Continue with the exemplary IPTT coordinated process, but with a full time (rather than part-time) visionary "champion"	partial	Strategic plan has been designed during a workshop last year. It now needs to be implemented.	3	IPTT
Recommendation #2: Work through CC's and CF's to reduce the high transaction costs of coordinating hundreds – or even thousands – of small scale producers to get sufficient quantities of plant products to export markets.	ongoing	Link more with CFs' facilitators via Rolf Sprung, DED and IRDNC	2	ICEMA/FFEM (Peggy & Pierre) working with NNF (R Sprung), IRDNC (Frederick Alpers, K Nott) and DED
Recommendation #3: If the Millennium Challenge Account (MCA) funding is	ongoing	(a) mopane and <i>Commiphora</i> (b) <i>Terminalia</i>	1	Peggy, Pierre and Karen Nott (IRDNC)

⁵ French Fund for Global Environment

⁶ Cunningham, A B. 2007. People, plants & landscapes: a review & recommendations for further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia. Unpublished report to ICEMA/FFEM, Windhoek, Namibia.

⁷ 1=Very high priority; 2=high priority; 3=Medium priority; 4=Lower priority

<p>forthcoming, consider expanding the “<i>plant product pipeline</i>” beyond the cosmetic oils⁸ focus to include: (a) <u>flavours & fragrances</u> (including aromatic resins); (b) <u>commercial products from invasive plant species</u>; (c) <u>Functional food ingredients</u>; and (d) <u>Gums from <i>Acacia</i> and <i>Terminalia</i></u> colloidal gums, although, for reasons given below, may be less viable for export, but could be investigated for import substitution.</p>		<p>(c) <i>Guibourtia</i> (d) <i>Ochna</i></p>		
<p>Recommendation #4: Develop four pilot-study commercialisation projects building on the botanical diversity of CC’s for export that add to the “product pipeline”, namely:</p> <ul style="list-style-type: none"> • aromatic resins (Kunene conservancies); • high value oils (from <i>Ochna pulchra</i> and <i>Guibourtia coleosperma</i>, Caprivi CC’s, CF’s & Kyaramacan Trust, West Caprivi); • high value botanicals from invasive species (starting with <i>Terminalia sericea</i>); • functional food ingredients may be worth investigating; and • marketing cultivated plants for horticulture 	<p>partial</p>	<p>There has been a market survey done in 2005 and there is willingness to take this activity forward (Steve Carr, NBRI). <i>Guibourtia coleosperma</i> seeds with their oily arils were collected in May 2007 for Pierre du Plessis, but are still in storage and have yet to be analyzed. Good progress has been made by IRDNC with buying <i>Commiphora</i> resin in Kunene, following the signing of two commercial agreements with international buyers in 2007.</p>	<p>3</p>	<p>Peggy, Steve Carr/NBRI, Karen Nott/IRDNC and Pierre du Plessis.</p>
<p>Recommendation #5: Investigate the potential of “high-end” tourist lodges and hotels in southern Africa, including Namibia, as a market for plant products that give a “sense of place”.</p>	<p>Yes</p>	<p>Progress has been made towards marketing natural products through high-end lodges with the final report on the CBNRM Brand-name Recognition Assisting Niche-market Development (C-BRAND) project. This project was implemented by CRIAA SA-DC with support from the Namibia Trade and Poverty Programme (NTPP) sponsored by</p>	<p>1</p>	<p>Pierre du Plessis/CRIAA-SADC with IRDNC and private sector partnerships.</p>

⁸ Including seed oils from *Ochna pulchra* and *Guibourtia coleosperma* (see **Recommendation #4** below)

		the United Kingdom's Department for International Development (DFID) and has developed a community conservation namibia ⁹ brand that should be used for this purpose ⁹ (see Figure 1).		
Recommendation #6: Involve the Namibian Institute for Culinary Education (NICE) in selection of recipes & awareness campaigns for selected wild foods.	No	It would be strategic to get funding (for example through ICEMA/FFEM or from Aus-AID) to enable wild foods promoter and expert chef in Australia's hospitality industry, Athol Wark , to run a series of well-publicized training courses in Namibia. Although an Australian recipient in 2004 of the prestigious International Specialized Skills Institute Overseas Fellowship, followed by promotion of "bush foods" to high end markets in Japan, the USA and on Norwegian Cruise liners, Athol is originally from Zimbabwe, so understands and has an affinity with southern African wild foods. Contact details: P O Box 3052 Alice Springs NT Australia 0871. Web Site: www.warkabout.com.au . Email: info@warkabout.com.au	2	Pierre/ICEMA
Recommendation #7: Deal with distance from major markets for high value plant products by improving national readiness for e-commerce.	No	This recommendation needs implementation resulting through discussions and support from the Department of Trade and Commerce in the Ministry of Trade and Industry. This Department is responsible for national policies and programmes geared towards management, regulation, promotion, development and facilitation of internal trade, commercial and business activities, and international trade activities such as bilateral, regional and multilateral trade relations.	3	Trade and Commerce section, Ministry of Trade and Industry, Namibia, through CRIAA-SADC
INVENTORIES WITHIN CONSERVANCIES				
Recommendation #8: Develop a strategy	No	This has not been followed up yet, but the	3	Peggy Poncelet, Pierre du

⁹ Du Plessis, P. 2007. Strategy and Action Plan: Marketing CBNRM ecosystem services under the *community conservation namibia*[®] brand. Unpublished report, CRIAA-SADC.

linking inventories within Communal Conservancies & Community forests (<i>“People’s Biodiversity Registers”</i>) to the IPTT natural products “pipeline” approach & Namibia’s ABS responsibilities under the CBD.		People’s Biodiversity Register (PBR) training manual used in India (Gadgil, 2006) has been supplied to ICEMA/FFEM to assist in this process.		Plessis and NBRI.
Recommendation #9: To assist and stimulate the inventory, monitoring and resource management process in Communal Conservancies and Community Forests, collate, update and publish a cross-reference of vernacular-botanical names for Namibia.	Ongoing	Modules to be developed along with Forestry and training to follow. List of vernacular names could be obtained once gaps in the existing list will have been identified thanks to NBRI	2	Peggy, NBRI
Recommendation #10: Develop local capacity for effective, practical management systems for high value plant species in communal conservancies in Namibia that ensures the sustainable utilisation of these plant resources for the benefit of the local communities.	No	Training on how to use newly developed EB modules will be conducted later this year	2	Peggy
REVIEW EXISTING PATENTS & PLANT BREEDERS RIGHTS OVER NAMIBIAN PLANTS				
Recommendation #11: Commission a review of which information on Namibian plant species is already in the public domain or is patented.	No	This is an essential first step.	3	Pierre/ IPTT, together with Phytotrade (Cyril Lombard)
Recommendation #12: Review information on Namibian plant species to find out which have horticultural varieties are already registered (focussing on wild bulbous species).	No	South Africa is a major competitor, yet is also using Namibian species and varieties, so this review would have useful policy implications on the question of whether to co-operate in order to compete.	3	Pierre/ IPTT/MET
Recommendation #13: Design Access and Benefit-Sharing (ABS) legislation following the recent recommendations.	Partial	Some progress has been made on this by Mr S Shikongo and his colleagues.	3	Pierre/MET
Recommendation #14: Link Namibian products to the most recent legal “Certification of Geographic Origin”, <i>Appellation Origine Protégée</i> , which has recognition in European markets, as a	Very initial stage for KMS	A few workshops are planned for this year regarding the use of Geographic Indicators (GI) for Kalahari Melon Seed varieties.	2	CRIAA

product of the ethnobotanical inventory process within CC's (Recommendation #5).				
HVPS MANAGEMENT AT MUTIPLE SCALES				
MANAGE ECOSYSTEM LEVEL IMPACTS				
Recommendation #15: Manage and monitor key drivers at the landscape scale.	Ongoing	Photographic monitoring has been developed by the NRWG and training has been provided. Method could perhaps be improved.	2	NRWG
Recommendation #16: Strongly support the current process of developing fire management plans for the Caprivi and Kavango.	Yes	Financial support from ICEMA will go to Robin Beatty's fire management activities in Caprivi and later this year he will develop a fire management strategy for Kavango to be implemented next year.	2	Robin Beatty (IRDNC)
Recommendation #17: Assess the potential of linking a carbon related "payment for environmental services" to CC's in return for improved fire management.	Ongoing	Pierre du Plessis (CRIAA-SADC) and MET are active in this area. There may be potential to link carbon sequestration to the <i>community conservation namibia</i> [®] brand as part of payment for an ecosystem service.	3	Pierre
Recommendation #18: Tailor management & monitoring to particular landscapes & selected high value species within them.	Partial	This has been done in part through Tony Cunningham's recent work with ICEMA, but needs additional follow-up training and advisory support.	2	Peggy
Recommendation #19: Develop processes for priority setting & monitoring species of special concern: "keystone species" & rare HVPS.	Yes	Priority species have recently been identified for Caprivi. Tony Cunningham's report will enable the development of monitoring modules for those species and training on the field will then be provided.	2	Peggy
Recommendation #20: Get greater time-depth for landscape level management through relocation of fixed-point photographs, linking local and more formal scientific knowledge in their interpretation.	No	Could be done using the BIOTA photographic database of certain regions, plus historical photographs from the collections of Dr K L Tinley and the late Dr W Geiss. In the case of the West Caprivi, Frederick Alpers, with support from the EU project there, is keen to follow up with Ken Tinley.	4	Peggy and F Alpers/IRDNC & EU project, West Caprivi
Recommendation #21: Draw on local ecological knowledge of ecosystem dynamics, habitat types & drivers of change.	No	This has been done in part through Tony Cunningham's recent work with ICEMA, but needs additional follow-up training and	4	Peggy and Tony

		advisory support.		
Recommendation #22: Carry out an independent review of the firewood trade in Mkata and Ncumcara Community Forests.	No	No fuelwood was being sold at Ncumcara Community Forest on this visit although the problem with “first-party” branding still persists (this time for craft trade-marking, with little credibility (see Figure 1)). In addition, logging of <i>Baikiaea</i> trees at Ncumcara Community Forest needs independent review, as this is illegal under Namibian law and is unlikely to be sustainable.	1	MET or Directorate of Forests, in consultation with KfW or DED need to contract independent reviewers. Experts recommended are: Chris Hines or Jeff Calvert (Baikiaea) and Prof Charlie Shackleton (fuelwood sales).
RE-INTRODUCTIONS & PRE-EMPTING FUTURE EXTINCTIONS				
Recommendation #23: Re-introduce <i>Protea gagedi</i> to the Caprivi.	No	Not necessarily needed if recent reports from local people in West Caprivi of continued existence of this species there are true. Need to first confirm and locate the existence of <i>Protea gagedi</i> in West Caprivi and then develop an action plan for better management and perhaps cultivation.	3	NBRI
Recommendation #24: Anticipate and pre-empt trade related plant extinctions resulting from globalisation of trade	No	This falls under the CBD and Global Strategy for Plants Conservation (GSPC)	2	MET
BUILD ON APPROPRIATE LESSONS LEARNED IN OTHER PLACES				
Recommendation #25: Draw on appropriate lessons from Community Forests (CF) and Joint Forest Management (JFM) in other places	No	This is really needed, as indicated by unsustainable and illegal logging of <i>Baikiaea plurijuga</i> in Ncumcara Community Forest. JFM in several parts of India is now widely regarded as a failure (based on discussions during my recent visit there in May 2008 and recent research papers). CF in Namibia has a great deal to learn from the Indian experience.	1	ICEMA, DED, IRDNC
RESOURCE MAPPING, MANAGEMENT PLANNING & MONITORING				
Recommendation #26: “Harmonise” conservancies and community forest institutions to reduce the transaction costs of	Partial	Rolf Sprung from NNF has been investigating this part. HVPS modules could be circulated among CFs and training could be hold jointly	2	Peggy and DED/ DoF

adaptive management & monitoring HVPS		with CFs' facilitators.		
Recommendation #27: Avoid "fiscal forestry" which "mines" high value timber resources for short-term gains, rather than on sustainable management for the long-term.	No	This could become a serious issue as demand for hardwood timber for export to China and India reaches Kavango, not only for <i>Baikiaea plurijuga</i> , but other species as well.	1	ICEMA can facilitate this through MET and Forestry.
Recommendation #28: Value – and value-add – to cultural connections to landscapes, habitats and their component species.	Partial, on-going	This can be done in various ways, including through art, labelling or "telling the product story" when using the <i>community conservation namibia</i> [®] brand.	3	Mud-hut trading
Recommendation #29: Collect baseline data on priority species.	Partially	Ongoing survey for Devil's Claw. Survey to be carried out on <i>Ximenia</i> , <i>Terminalia</i> and <i>Citrullus lanatus</i> (Kalahari Melon).	1	Peggy
Recommendation #30: Enrich the inventory process through additional technical support and training to Community Resource Monitors (CRM's) that links to a PBR structure (see Recommendation#8).	No	The PBR Manual (Gadgil, 2006) which has been supplied to ICEMA (May 2008) would be a useful tool in this process.	4	MET, ICEMA/FFEM
Recommendation #31: Use "appropriate precision" in monitoring for adaptive management.	Ongoing	Need to link with NBRI for its expertise and support in data analysis for adaptive management guidelines.	2	Peggy, Tony and NBRI
Recommendation #32: Take a precautionary approach.	Yes	This approach has long been adopted for the large mammal component in CBNRM and needs to applied in CF as well.		MET, ICEMA, WWF-LIFE
Recommendation #33: An adaptive management approach is crucial, yet the boundaries of adaptive management need to be set by what is achievable and sustainable.	No	Simple, enforceable rules and a pragmatic approach to what is achievable when sustainable harvest is attempted are well recognised. Starting commercial harvest of resources which is likely to be unsustainable (eg: <i>Baikiaea</i>) or for which there is a very fine line between sustainable harvest and overexploitation (commercial <i>Guibourtia</i> fuelwood harvest using chainsaws) is not a wise move, judging from CF or JFM elsewhere and should be avoided, despite donor pressure to show a quick profit.	2	Peggy, Tony and NBRI
Recommendation #34: As soon as possible, "fill in the blanks" in the West Caprivi map through use of the approach already applied	No	This may have stalled due to local politics over Bwabwata National Park, but is still very necessary.	2	IRDNC with Conservation International (Carol Murphy)

in North-Central Namibia.				
Recommendation #35: Present results from economic assessments of high value plant species in a way that is easily understood by local people & can be taken into account in resource management decisions.	No	There is a huge need to communicate more on plant-related income generation not only at local level but also at institutional level and international level (ICEMA, NACSO, WWF, MET, FFEM, NRWG). Could be linked with recommendations #29 and 31.	1	Peggy and all stakeholders/experts
Recommendation #36: Develop of training materials illustrating "best practices" for high value plant species (HVPS) inventory, monitoring and management.	Partially	Could be done for <i>Ximania</i> and later for <i>Terminalia</i> . Methods have been developed for Devil's Claw (<i>Harpagophytum</i>) although the method used for measuring plots (by pacing out distance) should be modified to a measured distance (eg: using a 20 m rope) so that lengths are comparable.	4	Peggy
Recommendation #37: Expand the use of fixed-point photographs for populations of selected high value plant species.	No	Could be implemented for <i>Protea gagedi</i> and <i>Hoodia</i> , as well as <i>Terminalia</i> in selected trail harvest sites. Guidelines for the development of this activity are given in Cunningham (2007)	3	Peggy
BUILD NAMIBIAN CAPACITY				
Recommendation #38: Systematically develop a Namibian economic botany programme	Partially	Peggy Poncelet (ICEMA Researcher) recruited and based at NBRI and has been working with NBRI technical staff in the field. This is much appreciated by the NBI (G Maggs, pers.comm., 2008). There is a strong need to have a dedicated person within NBRI to carry on with HVPS of CBNRM after completion of ICEMA (especially for adaptive management based on analysis of community-based monitoring data).	1	NBRI, ICEMA, Pierre, Gillian

DEVELOP DRYLAND AGROFORESTRY				
Recommendation #39: Promote dryland agroforestry and enrichment planting in selected conservancies, including “underground agro-forests”.	No	There is a useful opportunity to raise funds for this component linked to adaptation to climate change & food security.	3	IPTT
Recommendation # 40: Get international funding to review <i>Acacia</i> trials in Zimbabwe implemented under the Africa Acacia Trials Network.	No	It would be best to wait until things settle in Zimbabwe before following this up.	4	IPTT or Directorate of Forestry
Recommendation # 41: Establish provenance collections and trials of <i>Terminalia sericea</i> .	No	Will be done this year.	2	Peggy with Directorate of Forestry
Recommendation #42: Develop multiple-use management systems for mopane woodlands.	No	Richard White’s (1979) early work on this is useful and this could be expanded to include <i>Terminalia</i> woodlands as well.	3	Directorate of Forestry
CERTIFICATION, TRACEABILITY & SUSTAINABLE HARVEST				
Recommendation #43: Reduce the costs of certification, tailoring certification systems to local circumstances and smallholder production	Partially	Cost of certification to be reduced by combining several products for certification assessment (Devil’s Claw, Marula, Mopane,...)	4	CRIAA
DEVELOP MARKETING STRATEGIES FOR VALUE-CAPTURE FROM BULBS & SUCCULENTS				
Recommendation #44: Investigate marketing and strategic partnerships to beat competition from South African nurseries.	No	This requires private-public partnerships and careful thought.	4	NBRI with the IPTT
Recommendation #45: Develop strategic business plans for nurseries linked through conservancies to eco-regional satellite centres.	No		4	Peggy NBRI/ IPTT and Steve Carr
MOPANE CATERPILLARS & MARKETING				
Recommendation #46. Develop more intensive production and management of mopane “worms”, building on recent experience from other southern African countries.	No	This is an increasingly important issue. In April 2008, for example, at Ojongoro village, Kunene, 150 mopane caterpillar collectors each paid N\$100 just for the right to collect caterpillars, which were selling for N\$950 per	2	ICEMA and MET, with DED/KfW and IRDNC

		50kg sized bag, with collectors hoping to collect over 3 bags per person in order to sell mopane caterpillars in Windhoek and Walvis Bay ¹⁰ .		
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¹⁰ Kulunga, T. 2008. Mopane collectors happy in Kunene. The Namibian, Friday, April 18, 2008.



Figure 1. Sustainable harvest, credibility & branding. For the long-term benefit of local livelihoods, enterprises and conservation, claims of sustainable harvest or trade-marks claiming local origin of crafts or other products need to be credible, whether in Communal Conservancies or Community Forests. A. Flower of *Baikiaea plurijuga*, a tree species protected under the Forestry Act (no.72, 1968) and is a Red Data list species (lower risk, near-threatened). B. *Baikiaea plurijuga* log spray-painted NUCF (Ncumcara Community Forest). C. Aside from that fact that sustainable harvest is unlikely, *Baikiaea* logging raises questions about secondary damage to other trees along logging “skid-trails” and about inequitable benefit sharing, given limited access to tractors and chain saws. D. Claims of sustainability need to be backed up by research, particular where labelling is independently verified, but is done by the producers themselves. E. Hambera label on a Zimbabwean basket. F. Hambera craft products sold by the outlet Ncumcara Community Forest claim to “originate solely from Community forests of Kavango”, yet these labels are attached to Zimbabwean textiles and: G. Stone carvings from Zimbabwe; H. what was said by one of the NCF staff to be ivory (from Zimbabwe). I. Carved *Hyphaene* fruits (from Otavi). J. To regain credibility, and avoid customer confusion due to a proliferation of labels, adoption of a single label (such as *community conservation namibia*[®] brand) with claims that can be independently verified would be strategic.

5.0 Recommendations on key plant species to include in Event Book system

Adaptive management is a systematic and iterative way of improving resource management that emphasizes learning through monitoring management outcomes. Adaptive management is not simply changing management direction in the face of failed approaches. Instead, it is a planned way of learning how to improve policies or management practices over time in the face of uncertainty. What is needed in Namibia is to develop local and national capacity for HVPS monitoring and management.

5.1 Background on monitoring: “which species”, “why”, “how”, “who” & “when”?

With over 4000 species to choose from, it is crucial to prioritize species for management related monitoring. Criteria for choosing priority plant species are established¹¹. Resource managers, local Community Resource Monitors (CRMs) and technical support staff all are busy and thinly stretched, so in each CC, are realistically only able to focus on 3-5 key species. Collecting baseline data is an important first step in this process. Only then can monitoring begin.

Deciding whether or not to incorporate quantitative scientific approaches involves weighing the need for precise, or reliable, quantitative information against the cost of obtaining it. If scientific approaches are used, they can give the community a more precise idea of, for example, how much of the NTFP there is and how long it will take the resource to recover from harvesting. This will enable the community to set sustainable harvesting limits closer to the maximum possible. The community will also be able to make business plans, based on a sustained NTFP yield, with more confidence. However, using these approaches makes management more costly, especially since the precision of an estimate increases as the cost incurred obtaining it increases. In many cases, the cost required to obtain an adequate precision will make the use of scientific approaches impractical. If scientific approaches are not used, the community will need to apply the precautionary principle to a greater extent, for example by harvesting less ‘just to be safe’. They will also need to run their businesses with greater uncertainty. On the positive side, the costs of management will also be less and as Danielsen et al (2005)¹² point out:

“When properly designed, local schemes yield locally relevant results that can be as reliable as those derived from professional monitoring. Many management decisions emanate from local schemes. The decisions appear to be taken promptly, in response to immediate threats to the environment, and often lead to community-based actions to protect habitats, species or the local flow of ecosystem benefits; however, few local schemes have so far led to actions beyond the local scale. Locally-based monitoring schemes often reinforce existing community-based resource management systems and lead to change in the attitude of locals towards more environmentally sustainable resource management. Locally-derived data have considerable unexplored potential to elucidate global patterns of change in the status of populations and habitats, the services they provide, and the threats they face, but more effort is needed to develop effective modalities for feeding locally derived data up to national and international levels”.

5.1.2 Species selection processes in different ecological zones

Given current limits on available professional expertise for plant resource monitoring, strategic decisions need to be taken not just on who will monitor which resources, but also at what scale using which methods. In some cases, such as with *Harpagophytum procumbens* (Devil’s Claw), international, national and local incentives co-occur, while in other cases, they don’t (Figure 2).

¹¹ Cunningham, AB. 2001. Applied ethnobotany: wild plant use, people and conservation. Earthscan, London.

¹² Danielsen, F., N. D. Burgess and A. Balmford. 2005. Monitoring matters: examining the potential of locally-based approaches. *Biodiversity and Conservation* 2507-2542

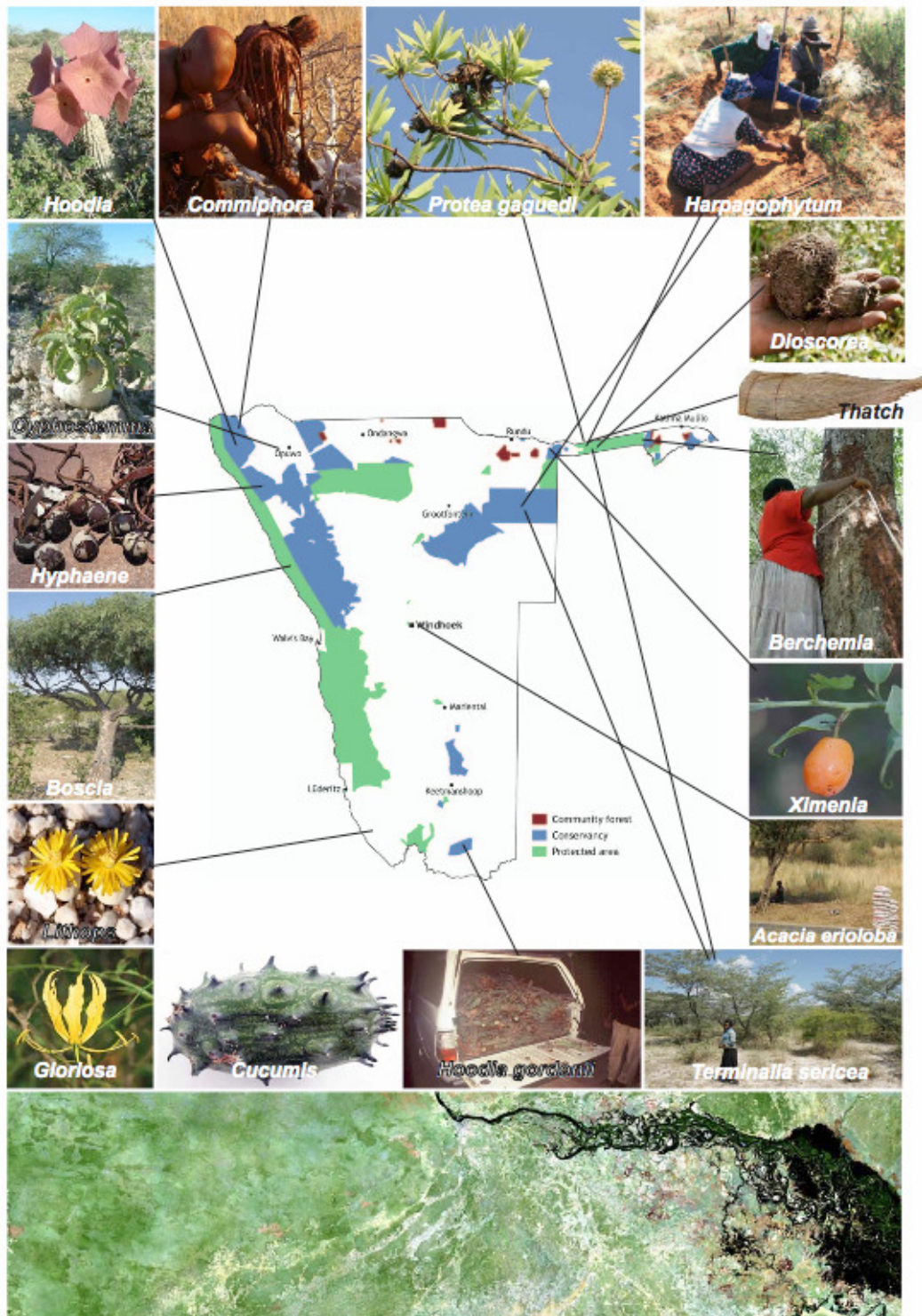


Figure 2. Species priorities, methods and appropriate spatial and time scales of monitoring vary greatly with geographic area and according to audience (local, national, international). In some cases, these coincide, either due to high use values, trade (*Berchemia*, *Harpagophytum*, *Hoodia*) or cultural values (*Boscia albitrunca*). In other cases, priorities are high locally, but low internationally (eg: edible *Dioscorea* tubers), high locally and nationally, but not internationally (*Protea gaguedi*) or high nationally and internationally, but where there is less awareness locally, export of genetic resources, such as for *Cucumis metuliferus*, *Gloriosa* (for commercial alkaloid production through cultivation outside Namibia) or rare *Lithops* species. In the Kuiseb delta, *Acanthosicyos horrida* populations also need monitoring, due to changing tenure and ecological circumstances. Lines indicate general area within CC's or CF's where monitoring could or does apply, except for genetic resources (eg: *Gloriosa*, *Cucumis*), which is a national and international policy implementation issue.

As it is important for plant resource monitoring to fit as closely as possible with the current Event Book system, we tested a prioritization framework previously used by Greg Stuart-Hill with CRM's. This was done in two group interview processes with separate groups of men and women in West Caprivi, based on two main steps. First, "free-listing" of local plant resources and secondly, ranking these plant resources from 1 to 6 according to four characteristics: **importance/usefulness** (1:Important/ 6:Less Used), **commonness/ rarity** (1:Rare/ 6: Common), **harvest impact** (1:Die when harvested/ 6:No impact) and **population trend** (1: Declining/ 6: Not declining). The results of these are presented in Tables 2-4. While the process used by WWF-LIFE in the past to prioritize plant species for resource monitoring was a useful start (resulting in a focus on *Berchemia discolor*, amongst other species, which should continue in modified form (see Module 2), the process can be improved in order to better prioritize plants for management and monitoring (M&M) in the future. The current process certainly helps make strategic choices for management and monitoring, leading to decisions on the costs (time, funding) and level of precision required for M&M (Figure 3).

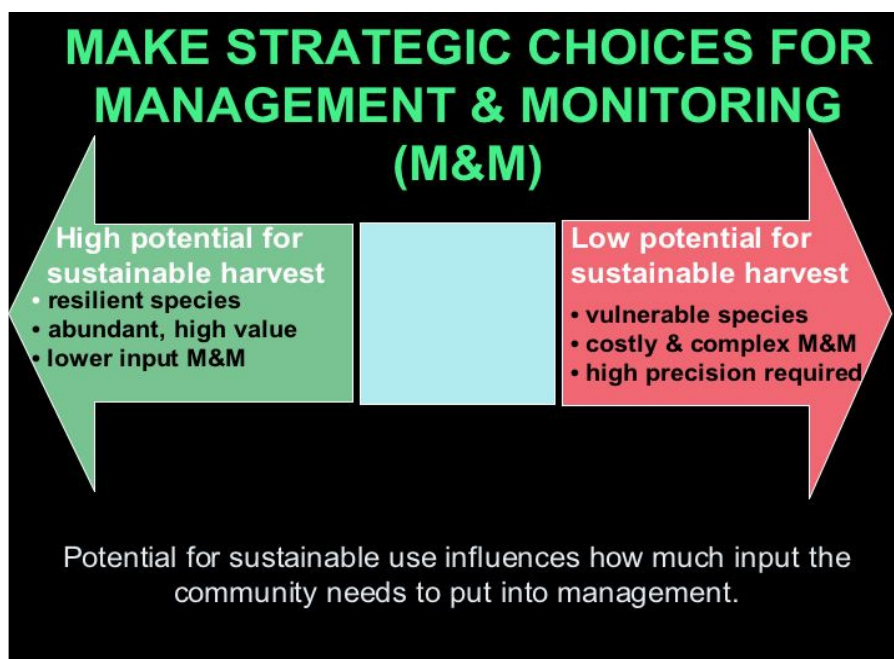


Figure 3. The potential for sustainable use influences how much input (time, funds, training) needs to be put into monitoring and management. In Namibia, for example, commercial harvest of thatch-grass or marula fruit after high rainfall years would fall to the left (high potential, lower input M&M) and medicinal root harvest from *Citropsis dawweana* or *Protea gagedi* to the right (low potential, more costly and complex M&M).

Suggestions for a future prioritization matrix¹³ are to:

- have community members **free-list useful species**, perhaps grouping them by **part used** (as in the trial process used in this field visit, fruits dominated the listings by men, only later followed by edible roots and tubers, when prompted. This was similar with the women's group, with household remedies added later);
- if not already done, group according to **part used**. In theory, harvest of leaves, flowers, seeds or fruits has a lower impact than harvest of bark, roots or the whole plant, but "**flag**" **species where branch cutting or tree felling to get fruits occurs**;
- rank species according to **demand**, "flagging" **commercially harvested species**, distinguishing those traded commercially on a local scale from those entering national or international markets;
- fine-tune the "**commonness or rarity**" approach using three criteria that link together (**geographic distribution, habitat specificity & local population size**, see Figure 5).

¹³ for more detail on this approach, see Cunningham, A. B. 2001. Applied ethnobotany: people, wild plants and conservation. Earthscan, London.

Table 2. West Caprivi, men's group, edible fruit bearing species, in order of mention, showing local rankings for **importance/usefulness**, commonness/rarity, **harvest impact** and **population trend** (the extent to which they were declining or not), using the earlier system used for setting M&M priorities. Although some species (eg: *Dialium englerianum*, *Guibourtia coleosperma*) could be useful for MET or DoF to monitor in terms of the impact of long-term fire effects, none of these species (aside from *Berchemia discolor*, which is being monitored by CRM's where commercial crafts production occurs), could be considered a CRM priority.

SPECIES	LOCAL NAME	Import/usefulness	Commonness or Rarity	Harvest impact	Extent declining	PARTICIPANTS COMMENTS
<i>Schinziophyton rautanenii</i>	!Xom	1	6	6	3	Common, fruits every year.
<i>Dialium englerianum</i>	//umbe	3	6	3	2.5	Does not fruit annually, instead, usually every 3 yrs. Fruit harvest by branch cutting.
<i>Guibourtia coleosperma</i>	tceu	2	6	3	3	Big fruit yields, but affected by fire. Trees also pushed over by elephants seeking fruit.
<i>Parinari curatellifolia</i>	naxani	2	6	3	3	Riverine species with yellow/orange fruit containing a nut.
<i>Diospyros mespiliformis</i>	tcukxom	2	1	6	3	
<i>Strychnos pungens</i>	//que	5	6	6	5.5	
<i>Strychnos cocculoides</i>	!x'una	4	6	6	5	
<i>Diopsiros chamaethamnus</i>	Tc'inya	4	6	6	6	Also used medicinally by women.
?	N!umitara	4.5	6	6	3	Low, small shrub.
<i>Grewia falcistipula</i>	cee	4	6	6	3	
<i>Grewia retinervis</i>	//x'ani	4	6	6	3	
<i>Berchemia discolor</i>	tcitcere	5	6	6	3	
<i>Ochna pulchra</i>	kyara	2	6	2.5	2.5	Oil has a long shelf life. Fruiting every 2-3 years. Branch cutting occurs.

Table 3. West Caprivi, men's group, edible roots & tubers: species, in order of mention, showing local rankings for importance/usefulness, commonness/rarity, harvest impact and population trend (the extent to which they were declining or not), using the earlier system used for setting M&M priorities.

SPECIES	LOCAL NAME	Import/usefulness	Commonness/Rarity	Harvest impact	Extent declining	COMMENTS
<i>Dioscorea species</i>	Dinga	1	6	2	6	Easy to replant from tubers, eaten in old times. Mixed with mangetti kernels, punded.
<i>Dioscorea asteriscus</i>	Tcere	1	6	2	6	Available each year.
?	Lu'na	5	6	2	6	Eaten by old people, but bitter, so not liked by young people.
<i>Vigna vexillata</i>	!iya	1	6	4	6	Quenches thirst, can be eaten raw.
?	nanga	5	6	4	6	Traditional food, mixed with mangetti kernels.
?	diga	5	6	4	6	Bitter, eaten with mangetti.
?	tcamini	1.5	6	2	6	Nice food.
<i>Talinum species</i>	//gereku	1	6	3	6	Nice food, mixed with mangetti.



Figure 4. Two local priorities, West Caprivi: edible *Dioscorea* tubers. A. Drying leaves of the climbing *Dioscorea asteriscus* (locally known as *tcere*). B. Detail of leaf. C. Large & medium sized tubers. D. Tubers are either roasted whole or peeled, then boiled, throwing out the first water as part of detoxification. E. Small seed tubers. F. *Dioscorea* species (locally known as *dinga*), G. with characteristically long tubers, carefully dug out using two fingers. H. Section of tuber. I. Young *dinga* plant. J. Digging *dinga* in riverine woodland (*Acacia nigrescens*-*Berchemia discolor*-*Garcinia*).

Local ranking of *Protea gagedi* in Table 4 provides a good example of why a finer-tuned system to rank priority species is suggested. What should also be considered is group discussion processes with specialist user groups for some resource categories (eg: herbalists, traditional midwives, basket makers and woodcarvers). Although it is widely considered extinct in the wild in Namibia and the focus of an extensive search (P Horn, pers comm., 2004), *P. gagedi*, which was never common, was not ranked as particularly rare or in decline. In discussions after the group ranking process, local people said that it was “finished” at Borica, but still occurred further along the same *omuramba*. When sought after this fieldwork by P Poncelet with local assistance, no trees were found. In addition, although used as an aphrodisiac by men, it was not mentioned by the men’s group at all, and neither was *Citropsis daweana*, which has a limited distribution in Namibia and whose roots are intensively collected for medicinal purposes. In addition, as gaps in botanical names in Tables 2-4 show, priority setting can’t be done in a hurry and needs fieldwork, back-up by a comprehensive cross-reference of vernacular names to botanical names (Recommendation #9).

Table 4. West Caprivi, women's group: species, in order of mention, showing local rankings for importance/usefulness, commonness/rarity, harvest impact and population trend (the extent to which they were declining or not), using the earlier system used for setting M&M priorities.

SPECIES	LOCAL NAME	Import/ usefulness	Rarity	Harvest impact	Extent declining	COMMENTS
<i>Schinziophyton rauteneni</i>	ixom	1	4	6	6	Edible nuts
<i>Guibourtia coleosperma</i>	tceu	3.5	3	6	3	fruit
<i>Ochna pulchra</i>	kyara	5	3	2	4	Seed oil
<i>Dialium englerianum</i>	//umbe	2	2	3	3	fruit
? <i>Strychnos pungens</i>	//que	5	2	6	4	fruit
<i>Berchemia discolor</i>		2	5	4	6	Fruits & basketry dye
? <i>Strychnos coccoloetus</i>	!x'uma	6	2	6	3	fruit
<i>Parinari curatellifolia</i>	naxani	2	1	6	4	fruit
<i>Diospyros mespiliiformis</i>	tcukxom	5	5	6	6	fruit
<i>Ficus cordata</i>	!xava	5	5	6	6	fruit
<i>Indigofera flavicans</i>	!gabe	1	6	3	5	roots
<i>Piliostigma thoningii</i>	Du!gu	1	6	6	5	Leaves, to treat coughing
<i>Bolusia amboensis</i>	//'okhwe-ceu	1	4	2	5	Roots, for children's disease
<i>Vernonia gerberiformis</i>	khai	1	3	1	6	Roots, used by men as an aphrodisiac
<i>Pergularia doemia</i>	!xen!am	1	6	1	5	Roots, used by men as an aphrodisiac
?	Xom //evu	2	4	1	5	Roots, used by midwives
<i>Harpagophytum procumbens</i> / <i>H. zeyheri</i>	Xam!!avu	1	2	3	4	various
<i>Markhamia zanzibarica</i>	dikurwathiku	2	5	4	5	Roots, baby
<i>Tapinanthus oleifolius</i>	/xom!!aa	2	2	1	2	Seeds, branches for luck
<i>Sida cordifolia</i>	mukavu	2	2	4	5	Roots, for babies' disease
<i>Dioscorea species</i>	dinga	2	5	1	6	Roots, for food
<i>Dioscorea asteriscus</i>	tcere	2	6	3	5	Roots, for food
<i>Pterocarpus angolensis</i>	N!ao	1	6	5	6	Roots (dye?)
<i>Diospyros chamaenanthus</i>	Tc'inya	1	4	5	5	Fruits edible, dye for basketry
?	ndondo	1	3	6	6	fruits
<i>Eragrostis species?</i>	//ao'	1	1	6	2	Baskets, grass
<i>Vigna vexillata</i>	//iya	1	3	3	6	Edible roots
<i>Ipomoea oblongata</i>	!iya	1	3	3	6	Roots to protect from problem animals
<i>Protea gaguedi</i>	//ua !xanda	1	4	3	6	Roots, used by men as an aphrodisiac
?	nkyave	2	3	3	6	Roots, for babies disease
?	Kx'akhwe-doa	1	5	4	6	Roots, for medicine

When a decision has been reached on who will monitor which species and why, and at what level of detail from the most basic (how much is harvested or sold) to more detailed (resource management planning, inventory and yield studies (Figure 6)), then decisions can be made on who collects the data, processes it and who gets the results. Adaptive management planning for experimental commercial harvest of *Terminalia sericea* roots, for example, could be subject to a management plan.

1. Geographic range	LARGE		SMALL	
2. Habitat specificity	Wide	Narrow	Wide	Narrow
3. Local population size				
Large & dominant somewhere	Locally abundant, several habitats over large geographic area	Locally abundant in a specific habitat over small geographic area	Locally abundant, several habitats over large geographic area	Locally abundant in a specific habitat over small geographic area
Small, non-dominant	Constantly sparse in several habitats over a large geographic area	Constantly sparse in a specific habitat over a small geographic area	Constantly sparse in several habitats over a large geographic area	Constantly sparse in a specific habitat over a small geographic area

Figure 5. Ranking commonness or rarity based on an iterative process through three main criteria: geographic distribution, habitat specificity and local population size. The most vulnerable category of species would be popular, destructively harvested, commercially valuable plants that fit into the bottom right block (“constantly sparse in a specific habitat over a small geographic area”).

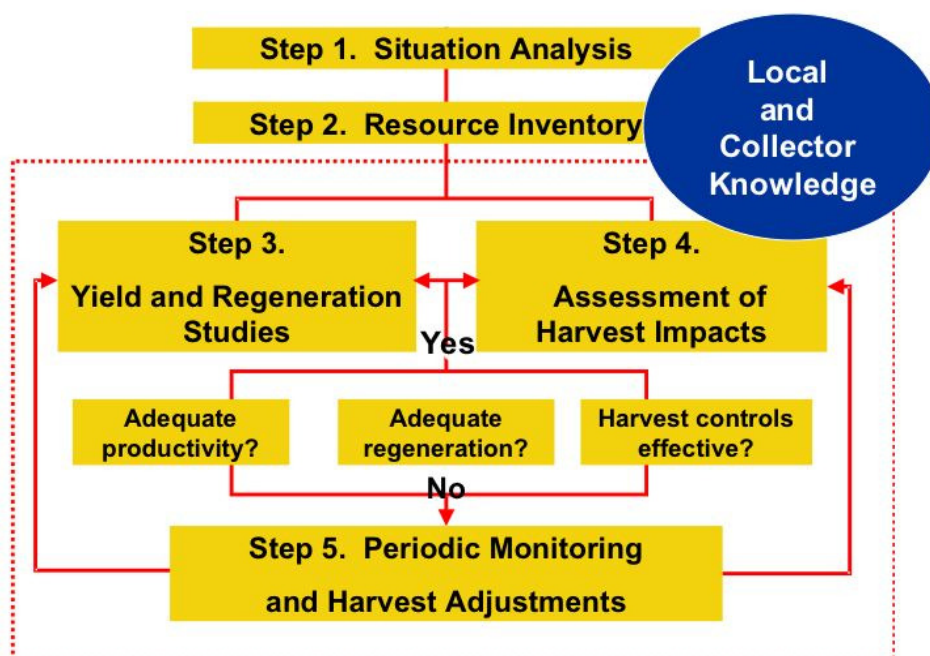


Figure 5. The adaptive management planning process (for example for *Ximenia* and possibly, for *Terminalia*).

6.0 Recommendations for applied research on *Ximения*

In 2005, 700 members of the *Ximения* collectors group near Eenhana in North-Central Namibia collected 21 tonnes of *Ximения* seed. These are the source of a valuable cosmetic oil supplied through CRIAA-SADC to the international market (Figure 6).

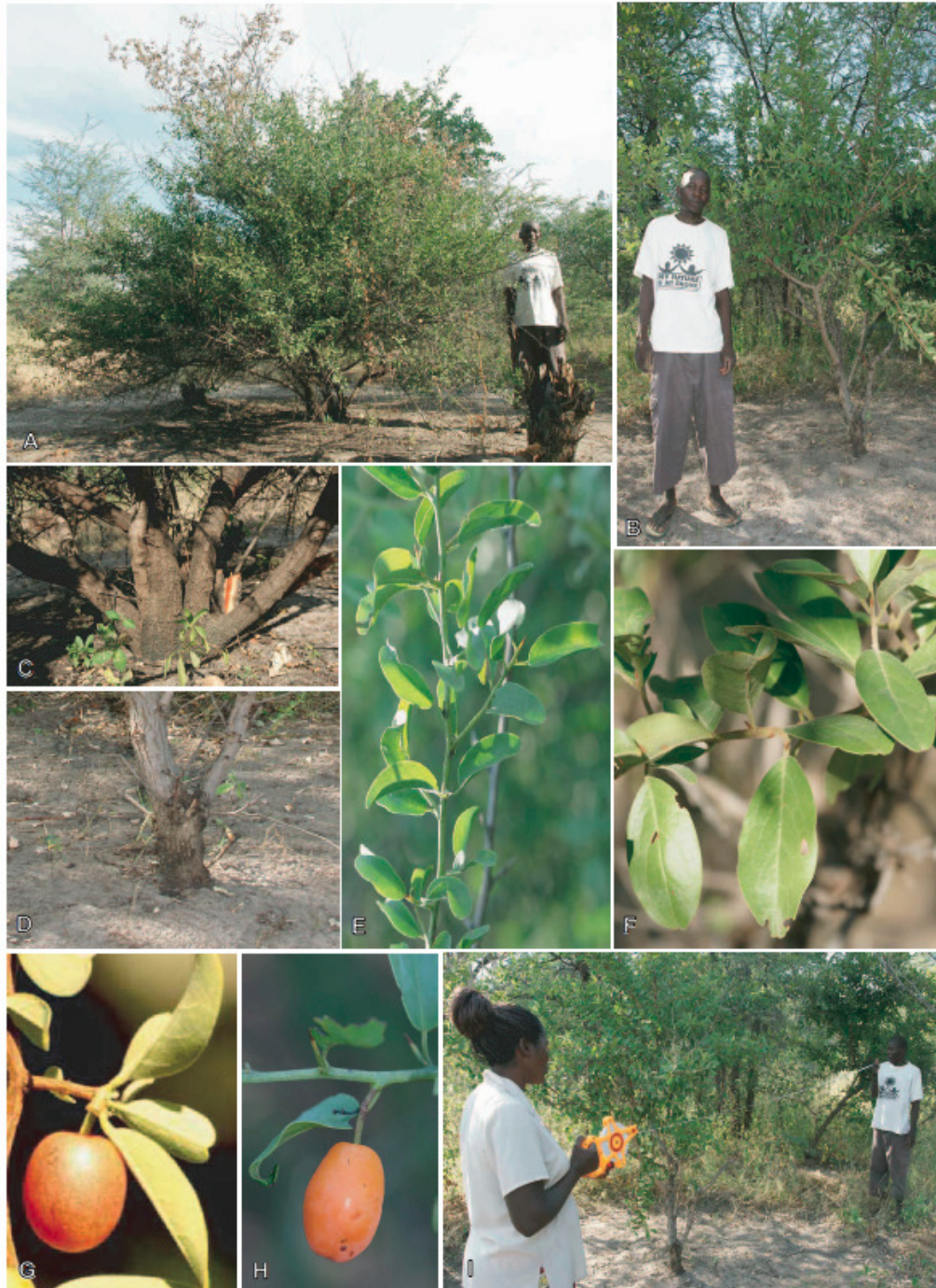
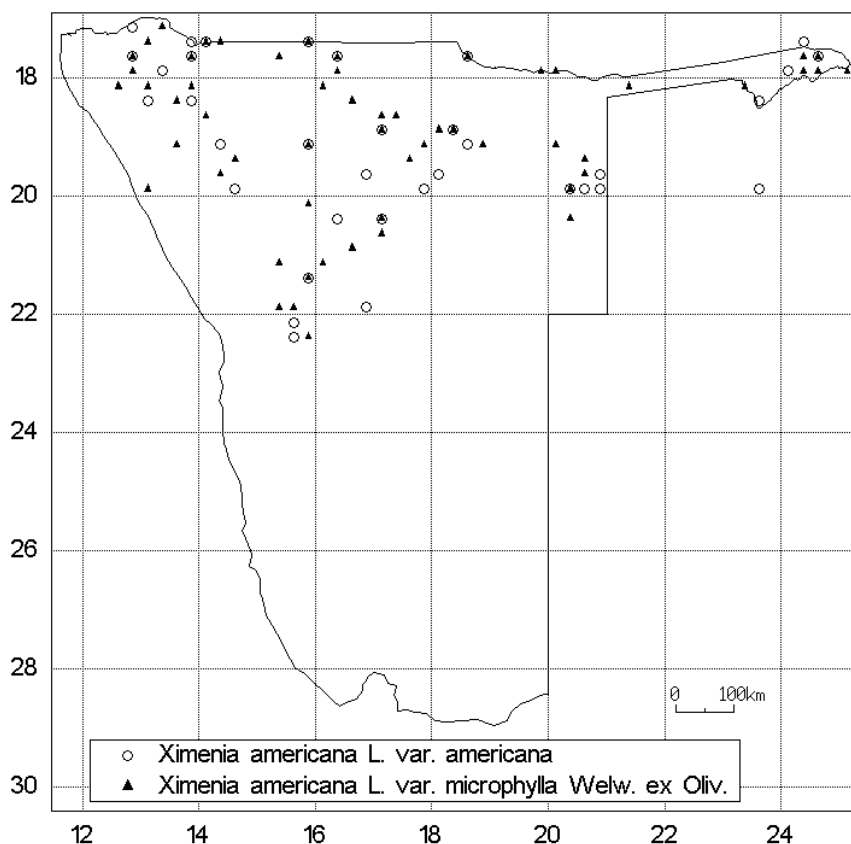


Figure 6. The very different functional ecology of the two Namibian *Ximения* species, *X. americana* and *X. caffra* needs to be recognized and taken into account in resource management planning and in the longer term, plantation or agroforestry production. A. *X. americana* is a multi-stemmed, vigorous re-sprouter with a high tree crown: stem ratio and smaller seed mass. B. *X. caffra* is generally single stemmed, has a lower crown: stem ratio and has larger seeds. C. *X. americana* detail of multiple stems. D. *X. caffra* showing detail of single stem. E. *X. americana* showing small leaf size. F. *X. caffra* showing larger leaf size. G. *X. caffra* showing larger, redder (and tastier) fruit. D. *X. americana* showing smaller fruit. I. Measuring crown diameter.

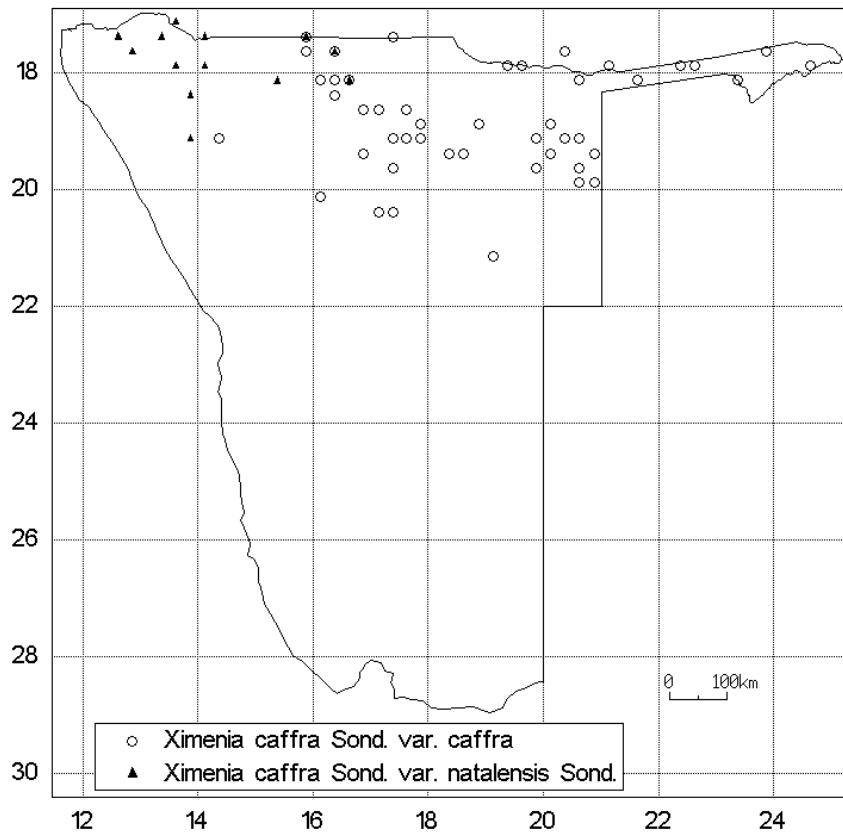
The objective is to competitively produce a quality oil high in ximenynic acid (which is the same as santalbic acid), bulking up quantities from 20-30 tonnes of kernels/yr to 200-300 tonnes/yr. With c.1400 seeds/kg and oil content of c.40%, this is a lot of seeds (and fruits)!! As the bulk-buyer of *Ximenia* is a French company and there is an existing, viable trade, it is suggested that the following questions should be addressed as a priority before the ICEMA/FFEM project ends:

1. Can projected export needs of 200-300 tonnes of oil/year be met in an economically viable, ecologically sustainable and socially equitable way through expanding production beyond North-Central Namibia?

To answer this requires research on the following: What is the ximenynic acid content of the seed oil from the different *Ximenia* species and sub-species (see Maps 1 and 2). How does the ximenynic acid content vary across their range in Namibia (or if sourcing is through Phytotrade members, across southern Africa)? Are the bulk suppliers willing to mix seed oil from different provenances and standardize their product according to a set percentage of the ximenynic acid content, as is common practice with several wild sourced natural products (such as *Prunus africana* bark extract, standardized at 13% sitosterol content)? Once suitable production areas close to good road infrastructure are identified, then a research process of mapping (land-types), *Ximenia* stock assessment and yields per tree needs to be continued, following Peggy Poncelet's current initiatives on this with Community Resource Monitors in North Kaudhum.



Map 1. Distribution of two *Ximenia americana* varieties in Namibia, *X. americana* var. *americana* and *X. americana* var. *microphylla*.



Map 2. Distribution of two *Ximenia caffra* varieties in Namibia, *X. caffra* var. *caffra* and *X. caffra* var. *natalensis*.

Locating the genus *Ximenia* the family Olacaceae has long been controversial, and only this year (Jan 2008) has it been sorted out and reclassified based on molecular and morphological criteria. It is now considered to be in the Ximeniaceae¹⁴, along with the following genera:

- *Curupira* Black. 1 species, *C. tefeensis*, of Amazonian Brazil.
- *Douradoa* Sleumer. 1 species, *D. consimilis*, also in Brazil (Amapa, Para).
- *Malania* Chun & Lee. 1 species, *M. oleifera* in SW China.
- *Ximenia* L. 9 species in Old and New World tropics.

How can Namibia (or in the case of Phytotrade, southern African producers) beat the existing competition? Ximenynic acid is widespread in the Santalales (which include the Santalaceae and new families in the “old” Olacaceae) – for example in *Santalum acuminatum*, *S. album* and *S. obtusifolium* (ie: Australia & India), *Olax subscopioidea* (West Africa) and *Heisteria silvanii* (South America), as well as *Ximenia*. Indian multi-national companies, such as the Sabinsa Corporation already market ximenynic acid internationally as an anti-inflammatory and hair tonic, derived from Indian sandalwood (*S. album*). Unless mechanisation occurs, Australia is less of a competitor due to high labour costs, however ximenynic acid production in India is a potentially serious threat, as both *Ximenia americana* and *Santalum album* naturally occur there. The Sabinsa Corporation manufactures and markets phytonutrients, Ayurvedic herbal extracts and specialty fine chemicals for nutritional, pharmaceutical and food industries and has established markets in the India, the USA, China, Australia (see www.sabinsa.com). I therefore suggest the following strategies and options for expanded *Ximenia* oil production in Namibia:

¹⁴ Malécot, V and D. L. Nickrent. 2008. Molecular Phylogenetic Relationships of Olacaceae and Related Santalales. *Systematic Botany* 33:97–106

Short term strategy 1: try to source seeds from all species & sub-species from the wild at a competitive enough price that does not put local people off from collecting seeds. It is highly likely they all contain ximenynic acid. If this is the case, then it makes sense for ICEMA/FFEM, through Peggy Poncelet to continue fruit production research in north Kaudom. It would be really useful, however, to have ximenynic acid content of oils tested from all species and varieties (and ideally a range of collections from different sites), ie: for: *Ximenia americana* var. *americana* & *X. americana* var. *microphylla* as well as *X. caffra* var. *caffra* and *X. caffra* var. *natalensis*;

Short term strategy 2: either within Namibia or ideally across southern Africa, collect seeds from the largest seed bearing trees of *Ximenia caffra* and *X. americana* so that provenance trials can be established. *Ximenia* definitely is a hemi-parasite, but is not fussy about which plants are used as hosts¹⁵ and can grow without a host plant. That *Ximenia* is a hemi-parasite was first observed by a French scientist in the 19th century (published in 1900¹⁶) and later (1907) in India¹⁷. Both species grow well from seed, but are susceptible to fire. Based on horticultural work in KwaZulu-Natal, the suggestions are that *X. caffra*: “is easily cultivated from fresh seed with a mixture of river sand and compost (5:1). The seeds germinate after 14-30 days and transplanting should take place when the seedlings reach the two-leaf stage. This plant is partly parasitic, and will grow better once in the ground where it can make contact with other plant roots. The growth rate is moderate, up to 0.5 m per year, it can withstand moderate frost and it is drought resistant, but needs full sun”. There is evidence (from Tanzania) that *X. americana* can also be grown from cuttings, so this is worth trying.

Medium term strategy: Work with French business partners to see if ximenynic acid can also be derived from pod mahogany aril & seed oils, as this species is widely distributed across southern Africa. This would have to be a Phytotrade regional strategy and wouldn't be viable in Namibia, as there are just a few trees near Katima Mulilo, but *Azelia* is common in Zambia, Zimbabwe (less so due to conversion into timber and carved hippos) and Mozambique. I suggest this strategy as ximenynic acid is a mono-acetylenic fatty acid. The orange-red arils and cotyledon (seed) oils from *Azelia quanzensis* (Caesalpinaceae) contain crepenynic acid and dehydrocrepenynic acid (9,14-octadecen-12-ynoic acid) (65% of total fatty acids) and have been studied using nuclear magnetic resonance spectroscopy (Vlahov G, *Phytochemistry*, 1996, 42, 621). It may be possible to convert these to ximenynic acid (or they may be of great interest on their own, but that's another story);

Longer term strategy: In the long-term, to be competitive will require plantation production (or small plantations through out-grower schemes), probably of sandalwood mixed with *Ximenia*, based on selected high yielding provenances. Namibia should also consider importing seed from either Australian or Indian *Santalum* species for trials. The seeds are a lot larger than those from *Ximenia* and have a higher oil content (therefore are highly competitive). Natural host trees are *Acacia*. It may be that mixed plantations with *Ximenia* and *Santalum* could be established in Kavango or North Central Namibia.

7.0 Training processes and modules to mainstream the plant component

Community-based management and monitoring of high value plant species in CC's and CF's needs integration with and a similar level of as has been provided for monitoring of large mammals. Bringing plants into the Event Book system would follow the same three reporting

¹⁵ Musselman, L. J and W. F. Mann, Jr. 1979. Haustorial Frequency of Some Root Parasites in Culture. *New Phytologist* 83: 479-483

¹⁶ Heckel, E. 1900. Sur le parasitisme du *Ximenia americana* L. *Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences* 131: 764-765.

¹⁷ Barber, C. A. 1907. Parasitic trees of southern India. *Proceedings of the Cambridge Philosophical Society* 14: 246-256.

levels, clearly designated into yellow (CRA), blue and red forms. Community-based monitoring of selected plant species has already followed a similar approach, on two themes, firstly, resource assessment (dye plants (primarily *Berchemia discolor*) and secondly, the enterprise component (with a focus on crafts). Three phases are suggested:

- Phase 1: CRM's (Community Resource monitors), all together, training on use of modules;
- Phase 2: Links between Janet Mutota's (HVPS team) and Bevan Munali's Event Book team (including illegal activity monitoring into Event book system);
- Phase 3: Community leaders. The proposed Activity Plan for further integration of HVPS into CC and CF in Namibia is given below, as requested by Jo Tagg during the meeting in Windhoek on 14 April 2008 (Table 5).

Development of Training Modules suited to CRM's with low literacy or numeracy (such as those shown below) should be followed by field testing followed by annual 7 day field training courses where an experienced technical support person with an ethnobotanical background works with Dave Ward (sub-contracted for c. 2 weeks/yr) and Peggy Poncelet (ICEMA/FFEM) to assist with training processes and development of user-friendly forms for Event Books. Starting with what is already monitored for resource management and improving on this process is a good start. For example:

- *Berchemia discolor* is rightly being monitored by CRM's in East Caprivi, but the current form needs to be simplified, the tree sample size increased (from 9 trees in the Kongola area to at least 20 trees), with monitoring frequency decreased to just once a year. The Yellow form needs to be modified to clarify that "cm" means circumference (measured in centimeters (cm) at breast height (ie: 1.3m), with "Cover index" modified instead to reflect "Tree Crown health" (based on a ranking widely used in forestry, see Cunningham (2001) and (2007). The columns dealing with "number of people using this tree" should be deleted. The Blue form needs to collate the **bark damage** and **tree crown health** rankings into two separate histograms. Bark damage should not reflect careful cutting of bark (or scraping bark) from the outer trunk (which is sustainable), only bark removal that exposes the cambium (see Module 2);
- Thatch species (including *Hyparrhenia*, *Eragrostis* and possibly *Hyperthelia* and *Loudetia*) have been the focus of two attempts at developing a user-friendly system based on measuring biomass, first using a tape measure, then trying a different method (using a disk meter) (P. Tutalife and J Sitapata, pers. Comm., 2008). These were discontinued. As a "cover index" system has already been adopted within the Event Book system, based on annual relocation and assessment, a similar approach could be field tested for thatch-grass (see Module 1). In areas with *Terminalia sericea* encroachment, this could link to the root-bark and pole harvest experiments, if sufficient technical support is available;
- Although monitoring of mopane pole cutting was suggested as a priority in our meeting in Windhoek, 14 April 2008), CRM's in Kongola felt that this was being dealt with through the CF system;
- Devil's Claw (*Harpagophytum procumbens* and *H. zeyheri*) has probably received the most attention and technical support of all the non-timber products being harvested in Namibia, particularly since the failed attempt to CITES list the species. A lot of thought and field-testing have gone into developing management and monitoring system for *Harpagophytum*¹⁸, and the results could be developed into a user-friendly format for CRM's, as commercial harvest is taking place in Libuta CF, Masida CF and Kwandu CF elsewhere in the West Caprivi. My only concern is that the system of pacing out plot dimensions (rather than measuring them using a tape measure (or the cost-effective, user

¹⁸ Strobach, M and D Cole. 2007. Population dynamics and sustainable harvesting of the medicinal plant *Harpagophytum procumbens* in Namibia. Federal Agency for Nature Conservation, Bonn, Germany.

friendly equivalent in a community situation, ropes of known length) sets a precedent for pacing out plots (with resultant error creeping in).

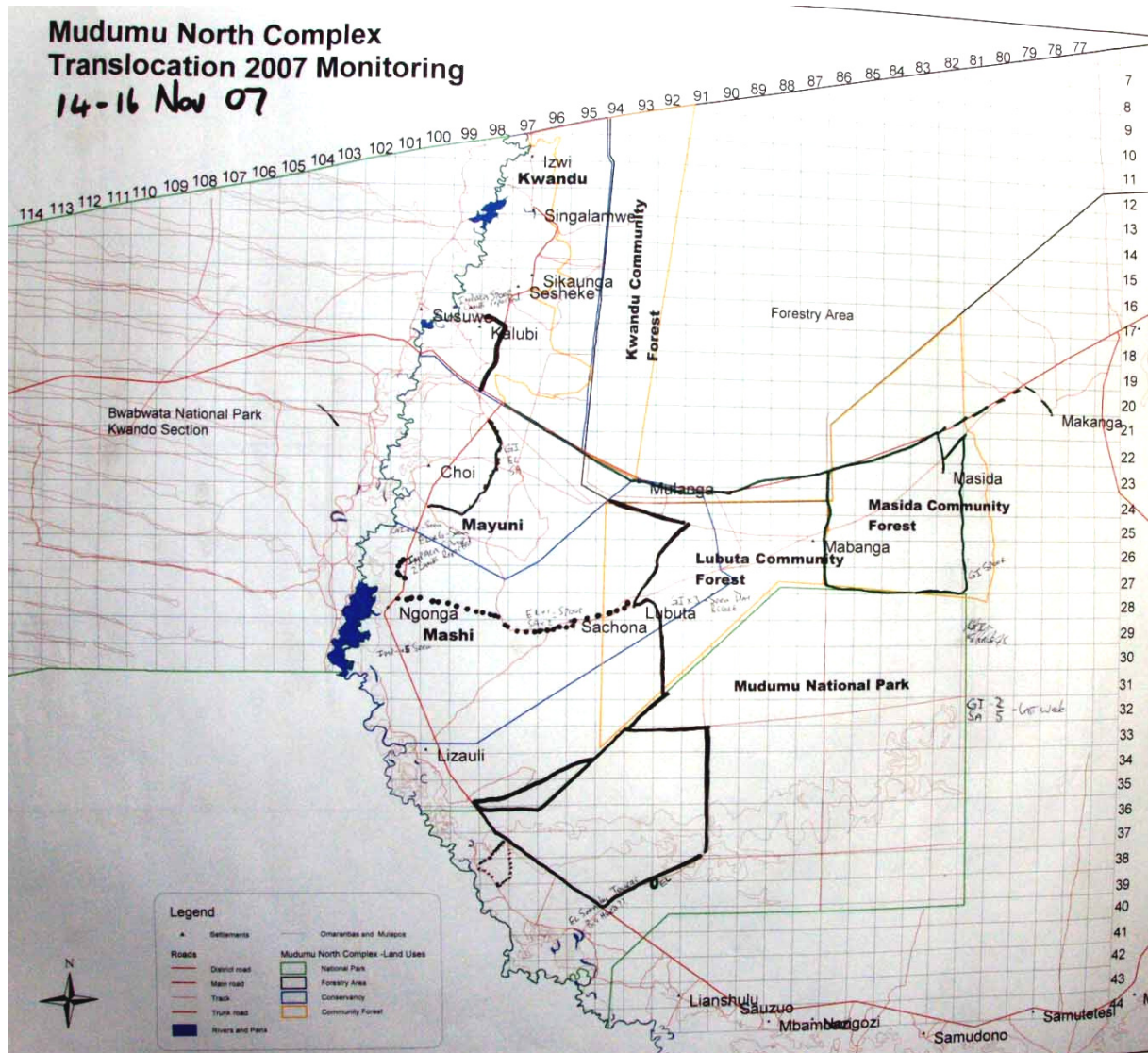


Figure 7. The user-friendly grid reference system currently used in monitoring in CBNRM should be applied in some cases to priority plant species (eg: records of new species being harvested on a significant scale or illegal activity monitoring).

What would be useful for species affected by different factors at different scales (eg: fire at the landscape level, harvesting or elephant damage at the species population level) would be to institute a co-ordinated, “nested” system of monitoring where different methods are used by different people/institutions (eg: for *Baikiaea*, *Ximenea* or for *Terminalia sericea*, if commercial root-bark harvest starts).

Monitoring *Ximenea* fruit production, which is a special case of participatory monitoring linked to technical support in order to be able to project what commercial quantities of fruit/seeds are produced (and assess population structure and fire damage) is a special case. The Excel spreadsheet for field-testing is attached with this report.

Table 5. Proposed Activity Plan for further integration of HVPS into CC and CF in Namibia

Activity	Timeline	Responsibility
1. Form an <u>HVPS working group</u> , organize quarterly meetings (ideally in conjunction with IPPT meetings), elect a national co-ordinator and secretariat. Work through recommendations made towards further integration of HVPS into CC and CF in Namibia (2007 ¹⁹ and 2008 ²⁰).	June-July 08	ICEMA/FFEM, with NBRI, MET, DoF, CRIAA-SADC, WWF, IRDNC, NNF and DED
2. Develop an <u>annual work plan</u> for HVPS integration and steps to when the ICEMA programme ends (2010). The work plan should specify further steps needed to complete the activities below (3-7.)	August –Sept 08	ICEMA/FFEM, with NBRI, MET, DoF, CRIAA-SADC, WWF, IRDNC, NNF and DED
3. Develop (simplified) <u>organizational diagram</u> with stakeholders that helps to clarify training needs (field testing of modified CRM forms, contracting Dave Ward, design of posters on HVPS, further training needs and where needed contracting of external consultants. Link with landscape level activities, e.g. Robin Beatty's fire management 2008 and define contributions/responsibilities of support organizations.	Sept – Oct 08	ICEMA/FFEM, with NBRI, MET, DoF, CRIAA-SADC, WWF, IRDNC, NNF and DED
4. Agree on and implement priority recommendations and implement in appropriate pilot areas. Field test and finalize CRM modules and forms in Jan 2009 when the annual review occurs. Yellow forms, either for previously unmonitored species considered a priority (mopane poles, devils claw) or modified (bark use) – electronic supplied (hard copy);	Dec 08/Jan 09	ICEMA/FFEM, with NBRI, MET, DoF, CRIAA-SADC, WWF, IRDNC, NNF and DED
5. Set milestones for technical implementation and mainstreaming plants into Event books during annual audit. Assessment of materials by Dave Ward and feedback	Aug- Sept 08	ICEMA/FFEM, with NBRI, CRIAA-SADC, WWF, IRDNC, NNF and DED.
6. With appropriate technical support, contracted externally if necessary, select and train CRM's and where appropriate, national technical assessment/monitoring teams in selected sites. Field training (TC, PP).	Jan 09 – April 09	ICEMA/FFEM, with NBRI, MET, DoF, CRIAA-SADC, WWF, IRDNC, NNF and DED.
7. Contract independent review and evaluation process (2009 or early 2010).	Dec 09 – Jan/Feb 2010	ICEMA/FFEM
8. Recommendations on final steps for ICEMA/FFEM plants component and steps beyond.	Mar 2010	

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¹⁹ Cunningham, A B. 2007. People, plants & landscapes: a review & recommendations for further integration of high value plant species (HVPS) into Community Ecosystem Management in Namibia. Unpublished report to ICEMA/FFEM, Windhoek, Namibia.

²⁰ This report.