

# **Abridged proceedings of the workshop on Alien Invasive Species in Namibia**

**Held at the University of Namibia, Windhoek**

**27-28 May 2004**

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**Note:**

These proceedings are a record of key discussions and conclusions of the workshop. Since they are not a record of each word spoken, they cannot be regarded as minutes. In most cases, the slides presented by each presenter, are reproduced as they were presented. However, in the case of the presentation by John Irish, the slides have been removed because their graphics make the document too large to distribute by email. A full copy of the presentation is available from the author.

## **Agenda**

### **Day one: Thursday 27 May**

08:00-09:00	Arrival and registration
09:00-09:15	Welcome and opening (Sem Shikongo - DEA)
09:15-09:30	Introductions
09:30-10:00	First presentation: Terminologies used (Herta Kolberg – MAWRD-NBRI) and Mike Griffin (MET-DSSS))
10:00-10:15	Discussion
10:15-10:45	Second presentation: Pool of information (John Irish – MAWRD-NBRI)
10:45-11:00	Discussion
11:00-11:15	Tea/coffee
11:15-11:45	Third presentation: Overview of legislation (Johann Malan – MET-DEA) and legislation enforcement in the agriculture sector (George Rhodes - MAWRD)
11:45-12:00	Discussion
12:00-12:30	Fourth presentation: Low impact control project – Prosopis (Pierre Smit - UNAM)
12:30-13:00	Discussion
13:00-14:00	Lunch
14:00-15:45	Working group exercises
15:45-16:00	Coffee/tea
16:00-17:00	Working group exercises
17:00	Closure

### **Day two: Friday 28 May**

09:00-11:00	Working group exercises
11:00-11:15	Coffee/tea
11:15-12:45	Group feedback and discussions on way forward
12:45-13:00	Closure (Sem Shikongo)
13:00	Lunch

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## Opening Address

Sem Shikongo

Deputy Director: Directorate of Environmental Affairs  
Ministry of Environment and Tourism

Ladies and gentlemen, good morning and welcome to this important workshop.

During 2004, an email discussion on the future direction and activities of the Alien Invasive Species Working Group (AISWG), one of the working groups of the National Biodiversity Programme, was initiated. The result was surprisingly encouraging with many fruitful comments and ideas from almost everyone who received the email. The comments confirmed the concerns about the inconsistent use of definitions, the requirements of information about alien invasive species, the roles of legislation and enforcement regarding alien invasive species and finally the inability to initiate appropriate, low-impact control projects.

Moreover, the discussion structured a sensible agenda for the proposed strategic planning session for future activities related to alien and invasive species in Namibia.

### Objectives of the workshop:

The objective of the planning session is to get finalization on the following:

1. **Terminologies used:** There is a great confusion about the use of terminology about alien and invasive species related to the Namibian context. Invasive species are not always alien and alien species are not always invasive. Similarly, the distinctions between alien and exotic and cosmopolitan species are not always clear. Although international applications of terminology may assist us, we need to formulate Namibian definitions. Even if these definitions do exist, we need to make it known to a wider audience.
2. **Create pool of information database:** There is a necessity to work on the compilation of a comprehensive register of all alien and invasive species. Complimentary of the register would be a classification of each species in terms of (potential) invasiveness and status with regard to (potential) ecological and economic impacts, abundance and spatial distribution.
3. **The refinement of legislation and eventual enforcement by the various line ministries:** The most applicable legislation to regulate alien and invasive species would be the Nature Conservation Ordinance, the Forest Act and the Marine Resources Act. But there might be jurisdictional overlapping between these pieces of legislation and concerted enforcement is not necessarily guaranteed.
4. **Initiate appropriate, low impact control projects for problem species.** We need to think wider than financial constraints here – how can we initiate ideas that are financially innovative while simultaneously benefiting people and the land they live on optimally.

Having a targeted audience with concerns about the same common issues, clear goals and workable expectations about the outcome, we are looking forward to a meeting of landmark importance and which will pave the way forward in terms of dealing with the issue of Alien Invasive Species in Namibia.

I thank you all for giving up your valuable time and I trust that we will have fruitful deliberations.

# Terminologies used

*Herta Kolberg*

Slide 1

**TERMINOLOGY & DEFINITIONS**

- **Indigenous** @ Native
  
- **Alien** @ Non-native @ Non-indigenous @ Exotic @ Foreign @ Naturalised @ Introduced @ Pest .....

Slide 4

**OTHER TERMS USED**

- **Non-native:** most general term, from outside the defined borders @ alien @ exotic
- **Exotic:** @ alien, but usually for species from further away, or for spectacular species

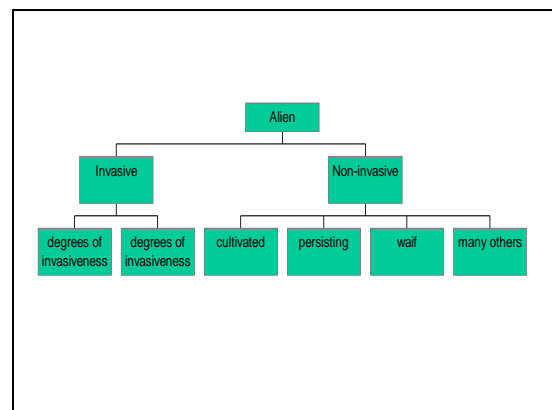
Slide 2

**DEFINITION OF ALIEN**

- CBD uses term "alien" but does not define it
- SBSTTA definition:

**A SPECIES OCCURRING OUTSIDE ITS NORMAL DISTRIBUTION**

Slide 5



Slide 3

**PROBLEMS WITH SBSTTA DEFINITION**

- what is "normal distribution" ?
- ecological vs. political boundaries
- term "species" to be defined as including all lower taxa, as well as any part capable of reproducing the species/taxon, LMOs & GMOs a subset

Slide 6

**ALIEN INVASIVE SPECIES**

- **CBD:** an alien species which threatens ecosystems, habitats or species
- **IUCN:** an alien species which becomes established in natural or semi-natural ecosystems or habitats, is an agent of change, and threatens native biological diversity

Slide 7

**CLASSIFICATION OF ALIENS**

- **Naturalised:** accidentally or deliberately introduced, reproducing and maintaining viable populations over years, dispersing and growing without deliberate human assistance
  - Spread depends on reproductive rate and time elapsed since introduction, giving rise to different degrees of naturalisation, incl. invasiveness.

Slide 10

**CLASSIFICATION OF ALIENS**

- **Adventive:** becoming naturalised, deliberate or accidental introduction
- **Established:** ◊ adventive ◊ introduced, but more securely naturalised
- **Introduced:** released accidentally or deliberately, growing without cultivation for at least 1 generation, but mostly applied to horticultural/ornamental species

Slide 8

**CLASSIFICATION OF ALIENS**

- **Invader:** non-native, replacing native species, having significant influence on the ecosystem and its function
- **Encroacher:** usually native, increasing in density, thereby excluding other (native) species, usually due to human influence/disturbance
  - Native invasives: get into modified habitats by their own means, population explosion, resulting in economic damage and reduced biological diversity

Slide 11

**CLASSIFICATION OF ALIENS**

- **Escapee:** ◊ waif ◊ volunteer, becoming naturalised from deliberate plantings, small area occupied, few individuals
- **Weed:** native or non-native, must be a nuisance to humans & their activities, mostly annual, only persist in severely and recently disturbed areas, agrestal, ruderal & environmental weeds

Slide 9

**CLASSIFICATION OF ALIENS**

- **Cultivated:** indigenous or alien, planted deliberately, actively maintained, grown for some use
- **Persisting:** remains at site of planting, don't spread, often the evidence of former human habitation/activity is no longer visible
- **Waif:** growing outside of cultivation but not spreading widely or reproducing for more than a few seasons ◊ volunteer ◊ escapee

Slide 12

**CLASSIFICATION OF WEEDS**

- **Ruderal weeds:** of wastelands
- **Agrestal weeds:** of cultivated lands
- **Environmental weeds:**
  - **Transformers/potential transformers:** mono-specific stands, altering natural ecosystem structure, integrity and functioning
  - **Special effect weeds:** mono-specific stands, can significantly degrade value or purpose for which natural ecosystem is valued, not necessarily dominating or altering structure and function
  - **Minor weeds:** invade and persist in natural ecosystems but are not particularly aggressive, do not dominate or seriously alter vegetation structure and function
- (cosmopolitan weeds)
- (noxious weeds)



## **CONCLUSION**

- **chose scale of categories - names or numbered - with definitions**
- **difficulty in assigning taxa to categories**

## **Mike Griffin**

### **ALIEN INVASIVE SPECIES**

Summary of the presentation:

- What is a species: According to CITES, it is any species, subspecies or separable population
- Caution: Do not place too much emphasis on sub-species, as these are essentially man-created concepts. A good example are the three buffalo populations in Namibia. One is in Caprivi, which is part of the central-Southern African population, the second is the remnant population in Tsumkwe area, which is disease free. The third is the Waterberg population, which is “genetic junk”, since it is based on buffalo from Addo in South Africa, with some additions from East Africa (via European zoos). All are the same species, but mixing them would undermine genetic integrity of Namibian buffalo
- What are invaders: people, weeds and the red eared slider (turtles from North America) are examples
- Species invasions: these are common occurrences, sometimes indigenous species (e.g. quelea) and sometimes exotics (house mouse)
- Biosecurity: this is an important issue, as illustrated by the case study of the Brown tree snake, which is transported in building materials, and has now invaded various islands in the Pacific. Another example is organisms that move around the world in bilge waters in ships.
- Biosafety: is another topical issue, which deals primarily with protecting the genetic integrity of indigenous species (e.g. crops, Namibia’s buffalo, pythons, etc.).
- Genetic pollution occurs as a result of injudicious cross-breeding, either intentional or unintentional. A serious example in Namibia is the breeding between domestic cats and the African Wild Cat. In the long term, the true African Wild Cat might no longer exist in the country, or the world. This can also occur when there are re-introductions of species into an area where they formerly occurred. One must know where the stock is coming from, and whether they are of the same genetic make-up as those that originally occurred in the area earmarked for re-population. If the re-introduced animals/plants are not the same as those that were there, then the re-introduction has no conservation value, but it might have tourism value, for example. Ecological problems may arise with the introduction of non topo-typical introductions.
- Genetic pollution can also occur as a result of veterinary quarantine operations, where an animal is held in an area, but then is moved away. Even though the animal (e.g. an alien species) itself is not released into the natural environment, parasites (e.g. internal) may have been introduced into the area.
- There can also be indirect introductions, for example the expanding range of sea snakes into Namibian waters. The range expansion might be a result of *El Nino* phenomenon, which might be linked to global warming, which is thought to be anthropogenic. If this link is proven, then the range expansion is human induced and the species could be regarded as alien.

#### **Conclusion:**

The Precautionary Principle must be applied as the key strategy in preventing the introduction and/or spread of aliens.

## **Pool of information**

**John Irish**

## **Excluded**

# Legislation (general overview)

Johann Malan

## Slide 1

### Acts Dealing With AIS

- ◆ Nature Conservation Ordinance 4 of 1975
- ◆ Forest Act 12 of 2001
- ◆ Marine Resources Act 27 of 2000
- ◆ Inland Fisheries Resources Act 1 of 2003
- ◆ Aquaculture Act 18 of 2002
- ◆ Soil Conservation Act No 76 of 1969
- ◆ The Communal Land Reform Act No 5 of 2002
- ◆ Agricultural Pests Act No 3 of 1973
- ◆ Weeds Ordinance No 19 of 1957

## Slide 4

### Forest Act

- ◆ Purpose:
  - To *conserve* soil and water resources,
  - To *maintain* biological diversity and
  - To *use* forest produce in a way that is compatible with the forest's primary role as the protector and enhancer of the natural environment.
- ◆ Forestry Council, national forestry inventory, forest management plans, protected areas
- ◆ Afforestation > 15 ha: permission of Director (excluding fruit trees)
- ◆ No provisions on AIS
- ◆ Regulations being drafted

## Slide 2

### Nature Conservation Ordinance

- ◆ Covers game parks, nature reserves, communal conservancies, wild animals (game), problem animals, fish in inland waters (repealed) and indigenous plants
- ◆ No specific reference to AIS, but provisions can be interpreted

## Slide 5

### Marine Resources Act 27 of 2000

- ◆ Scope: regulates marine resources including the management, protection and utilisation of marine resources in Namibia and Namibian waters.
- ◆ Up to high water mark
- ◆ No provisions on AIS, but possible to amend certain sections for eg. Part VII dealing with management and control measures to conserve marine resources; regulatory powers; marine reserves

## Slide 3

### Nature Conservation Ordinance

- General powers: Section 78:
- b) Measures deemed necessary or desirable regarding the *propagation and preservation* of wild animals, exotic game, fish and plants.
  - c) Measures deemed necessary or desirable for the *destruction, decrease or elimination* of any problem animal, wild animal, exotic game, fish or plant, which may be -
    - harmful or detrimental to the existence of any other species of wild animal, fish or indigenous plant
    - or which may present a threat from the point of view of farming or stock diseases.
- ◆ Ordinance under review: Parks and Wildlife Bill

## Slide 6

### Inland Fisheries Resources Act

- ◆ Requires drafting of a general policy on conservation and utilization of inland fisheries resources to -
  - ◆ a) Manage, protect and conserve inland aquatic ecosystems;
  - ◆ b) Promote sustainable utilisation and protection of inland fisheries resources;
  - ◆ c) Promote cooperation with other countries for research, management and development of shared resources.

Slide 7

## Inland Fisheries Resources Act

- ◆ Part VI of the Act deals with management, conservation and protection measures. It prohibits without the written permission of the minister -
  - The introduction into any inland water system, or transfer from one water system to another, any species of fish (translocated indigenous species)
  - The import of any live fish into Namibia
  - The export from Namibia any live fish declared as an endangered species under section 21.
- ◆ Fisheries reserves
- ◆ Regulations at present do not deal with AIS (deals with fishing licences, size of fish, methods of catching, prohibit dumping of substances injurious to fish, etc.)

Slide 10

## Aquaculture Act

- ◆ Offences:
  - Unlawful release of any aquaculture products or aquatic organisms or both from an aquaculture facility
  - Introduction or causing the introduction into any Namibian waters of any species of aquatic organism or any genetically modified aquatic organism or
  - Transfer of any species of aquatic organisms from one aquaculture facility to another. (Section 39)
- ◆ Regulations issued: GG No 3104 /2003

Slide 8

## Aquaculture Act

- ◆ General policy regarding aquaculture to be formulated to –
  - Promote sustainable aquaculture
  - Manage, protect and conserve marine and inland aquatic ecosystems;
  - Promote and operate aquaculture projects.
- ◆ Licence required; suspension and cancellation of licence authorised to ensure protection and conservation of the environment

Slide 11

## Problems With the Legislative Framework

- ◆ AIS not dealt with in most legislation
- ◆ Fragmented
- ◆ Various ministries: MET, MAWRD, MFMR
- ◆ Regulations: either not passed (Forest Act), or does not deal with AIS: Inland Fisheries Resources Act
- ◆ Duplication: inspectors under various acts

Slide 9

## Aquaculture Act

- ◆ Section 27: regulates the
  - introduction of aquatic organisms or any genetically modified aquatic organism or
  - transfer of any species of aquatic organism from one aquaculture facility in Namibia to another or from any location in Namibia to another
- ◆ Written permission of Minister required
- ◆ No approval to be issued unless EA, if required under legislation or policy dealing with environmental assessments
- ◆ Written permission required for import and export of aquatic organisms

Slide 12

## Suggestions

- ◆ Comprehensive legislation dealing with AIS
- ◆ Coordination of inspectors' functions: Inland Fisheries Resources Act as eg.: staff member, but also designation of staff from MET, rural development, regional council or local authority council with the concurrence of the the respective Ministers, RC or local authority council
- ◆ Coordination of regulations under various pieces of legislation, tailored to the specific Act, but dealing with AIS in a systematic manner (Maybe following same structure in the various regulations)
- ◆ Amendments to existing legislation, introducing AIS in definition sections

# Legislation and enforcement in the agriculture sector

George Rhodes

## Slide 1

The PRA FRAMEWORK

II. GUIDELINES of PHYTOSANITARY CERTIFICATION in INTERNATIONAL TRADE

- **EXPORT CERTIFICATION SYSTEM 1997** (ISPM 7)

III. SPECIFICS of PC in INTERNATIONAL TRADE

- **GUIDELINES FOR PHYTOSANITARY CERTIFICATES** (ISPM12)

## Slide 4

PLANT QUARANTINE RELATED ISSUES

- HISTORY – MAWRD charged – functional Plant Quarantine System
  - Should have world wide acceptance
  - Current legislation – outdated both in structure and definitions
  - PQ laws based on National and International obligations
  - In strict sense PQ refers to holding/isolation- until verified free from Pest/diseases
  - Meaning of PQ been broadened – taking all aspects into consideration
  - Concerned with the movement of plant material within national territory and between countries
  - Therefore taking all the aforesaid into consideration – PQ means the legal restrictions on the movement of commodities for the purpose of preventing the or delaying the establishment of plant pest and diseases in areas where they are not know to exist.

## Slide 2

The PRA FRAMEWORK

II. GUIDELINES of PHYTOSANITARY CERTIFICATION in INTERNATIONAL TRADE

- **EXPORT CERTIFICATION SYSTEM 1997** (ISPM 7)
- **Purpose of Export certification system is to:**
  - ascertain the relevant phytosanitary requirements of the importing country (including import permits if required)
  - verify that a consignment conforms to those requirements at the time of certification &;
  - Issue a phytosanitary certificate
- **Legal Responsibility:**
  - bear the legal authority for its actions
  - implement safeguards against potential problems
  - fraudulent use of certificates

## Slide 5

- Namibia – certain species of plants, animals and birds that are native to our country.
- Also have a collection of insects, fungi, bacteria, viruses, snails, nematodes, and weeds that originates here.
- When human beings move plants, seeds and even goods from one country to another – distinctive possibility to move a plant pests or disease from its native habitat to a new location.
- No one can predict the biological impact of the new pest and disease in the new location.
- They are freed from their natural enemies and competitors in their place of origin and may have more serious effects in the new environment
- Human beings the main distributor.

## Slide 3

The ISPM FRAMEWORK

II. GUIDELINES of PHYTOSANITARY CERTIFICATION in INTERNATIONAL TRADE

- **GUIDELINES FOR PHYTOSANITARY CERTIFICATES** (ISPM12)
- **Purpose:**
  - guidelines for the preparation and issue of phytosanitary certificates and phytosanitary certificates for re-export.
- **Describes:**
  - Mode of issue, Attachments - Invalid phytosanitary certificates,
  - Unacceptable certificates - Fraudulent certificates
- **Preparation and Issue:**
  - Phytosanitary Certificates,
  - Additional Declaration, Phytosanitary
  - Certificates for Re-export

## Slide 6

- In the past plant material moved without any precautionary measures – resulted in the arrival of plant pests and diseases where they previously not exist (AIS included)
- Namibia – no exception
- Consequently most countries especially those with highly developed agricultural industries – have issued regulations or taken quarantine measures designed to prevent, or at least hinder the introduction of plant pests and diseases into their territories.
- Cornerstones – PQ System – up to date PQ ACT which permits effective enforcement.
- First line of defense – well trained core of PQ Inspectors at all points of entry into the country.
- Detection of PP/PD contained in plant material arriving or leaving
- Appropriate penalties – will deter travelers arriving with PM infected

## Slide 7

- Or infested with PP/PD.
- Finally – standards set in the Act's subsidiary legislation (REGULATIONS) will ensure that the nation can have confidence in the health and quality of its exported and imported plant material.
- Currently – lack of capacity, manpower – making use of existing structures and infrastructure to prevent introduction.
- Introductions might have devastating losses in crop yields – will require costly control measures.
- If staple crops are effected – Namibian population will experience scarcity of such commodities and steep price hikes on the remaining stock .
- COMMODITIES CLASSES

## Slide 10

- MAIL: Co-operative agreements – Postal, Customs and PQ Divisions
- Packing Material: - Prohibited – plant parts or plants
  - Citrus plants & plant parts
  - coffee plants and plant parts
  - cotton plants and plant parts
  - Forest Litter
  - Grass plants and plant parts
  - Leaves and stems of plants in general
  - Rice straw and hulls
  - Sugar cane plants or plant parts
  - Soil
- Authorised Packing Material: Sterilized peat or sphagnum moss  
Exfoliated vermiculate

## Slide 8

- PLANTS: limited to the smallest possible unit consistent with good horticultural practices;
  - rooted cuttings or any other plant division – soil free
  - approved packing may be used around the roots after soil has been removed;
  - Plants, if established in growing medium – not admissible
  - inspection of the roots impossible;
  - Specific regulations for each
- SOIL: Limited to entries under IP – destined for recognized scientific and research laboratories. Such imports will be subject to specific safeguards as specified on the permit.  
In addition the entry of soil will be authorized, in addition to above

## Slide 11

- HONEY BEES:
  - Ground cork
  - The entry of all living stages of honeybees is limited to entries under permit.
  - Entry of used bee keeping equipment (hives, frames etc) PROHIBITED
- Fruits and Vegetables : SUBJECT TO IMPORT PERMIT
- Ports of Entry – only designated ones as prescribed by IP
- Administrative Procedures
- Application Procedures.

## Slide 9

- Entry is limited to the smallest quantities
- Soil must be shipped in sturdy tightly sealed containers
- Soil may only be used in the permittee's laboratory
- It must be incinerated or otherwise sterilized at the conclusion of the tests.
- THE ENTRY OF ANY PLANTS/PRODUCTS, MACHINERY EQUIPMENT, CONVEYANCES OF ANY KIND CARRYING OR CONTAMINATED WITH SOIL IS STRICTLY PROHIBITED. First – freed from contaminating soil in an approved manner.
- PESTS – limited to IP – for research scientific purposes- subject to specific safeguards - on IP

## Slide 12

- HELP TO PROTECT NAMIBIAN AGRICULTURE.
- DON'T GET CAUGHT WITH YOUR PLANTS DOWN.
- THANK YOU.

# Prosopis Case Study

Pierre Smit

Slide 1

## THE CONTROL OF PROSOPIS IN NAMIBIA – CHALLENGES AND OPPORTUNITIES

Slide 4

### Specific properties (negative)

- Displaces local species
- Consumes precious sub-surface water
- Chocking surface drainage
- Losses in biodiversity
- Spoils landscape aesthetics

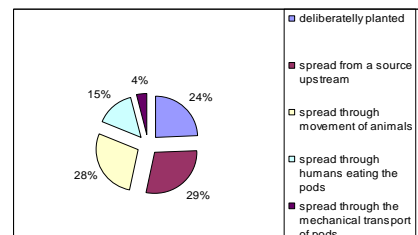
Slide 2

### GENERAL BACKGROUND

- Multiply rapidly in drylands, especially along drainage lines
- Most widespread invading alien species in Namibia
- Many users of Prosopis, but no natural enemy

Slide 5

### Reasons for Prosopis in Namibia



Slide 3

### Specific properties (positive)

- Fast grower, N-fixer, efficient root systems
- Drought-resistant (75 – 400mm p.a.)
- Opportunistic (disturbed ecology, human habitation, badlands)
- Produce nitrogenous substances to soil (N, humus, organisms)
- Increased pasture, provides new habitats, changes micro-climate
- Provides CO<sub>2</sub> sinks

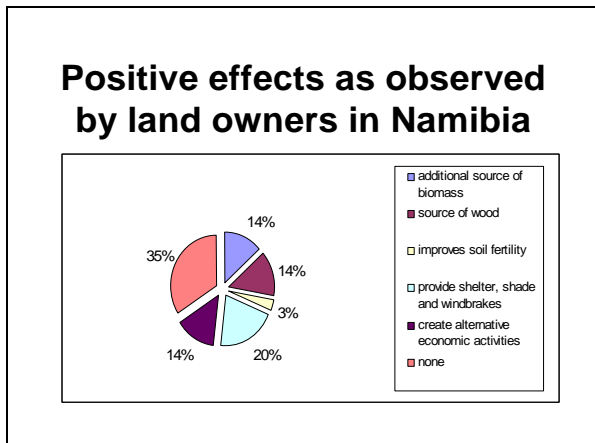
Slide 6

### Costs and benefits

- Pods (direct or indirect utilization)
- Pasture
- Firewood and charcoal
- Timber and construction material
- Shelter and habitats
- Form monostands
- Rapid increases
- Detrimental effects on episodic events (floods, fire)
- Risks of trans-boundary invasions
- Problematic management as weed



Slide 7



Slide 10

- ### Alternative uses
- Wood for carving industry, e.g. Okahandja
  - Wood-chips and saw dust for export to the barbeque industry of the USA
  - By-products e.g. pods as pellets (race horses and hares – USA); fire wood, charcoal and timber from pruning, lopping and removal; and apiculture in monostands
  - Bread maize, gruel, extracts, liquor and honey (like in South America)
  - Silkworm farming (on camel thorns presently)
  - Medicinal values?
  - Ornamental and shelter plant?

Slide 8

- ### Potential of pod utilization
- N\$250 (raw) to N\$500 per ton (processed)
  - At 5 tons per ha (100 trees @ 50 kg per tree) the 8,540ha-invasions along the Auob and Nossob Rivers can produce 42,700 tons of pods.
  - At N\$250.00 per ton this equals a value of N\$10,675,000 per annum.
  - Huge potential for job creation: Pod collection, scientific management of trees, processing of pod-products, etc.

Slide 11

- ### More about the current situation
- Commercial utilization is an undeveloped industry in Namibia
  - Operations are informal, unorganized and uncoordinated
  - Unemployed people, temporary workers, ad hoc efforts, on a local scale only
  - Little efficiency in harvesting methods and improving yields, or in lopping, pruning or removal of problematic plants
  - Little awareness about potential as resource
  - No quality control, no organized markets, no incentives

Slide 9

- ### Potential of wood as resource
- Timber = N\$150 – N\$3000 per ton
  - 4 –10 ton of timber per ha
  - Charcoal = N\$500 – N\$2000 per ton
  - 900kg per 5 tons per ha
  - Fire wood = N\$250 – N\$500 per ton
  - 5 – 25 tons per ha
  - Fencing and construction material???

Slide 12

- ### Chemical control
- Expensive
  - Counter effects (affects other organisms)
  - High failure rates (due to lack of knowledge)
  - Labor and care intensive (tedious)
  - Effective in individual treatments

Slide 13

**Biological control**

- Two types of beetles: *Algorobius prosopis* and *Neltumius arizonensis* in Namibia
- Slow in results, cannot reduce existing encroachments
- Reduce only the reproduction potential of plant (and only a portion thereof)
- Can only attack ripe pods, i.e. in storage or under tree, which means further spread is possible
- Still in search for complimentary bio-agents

Slide 16

**Awareness and scientific knowledge**

- What are the ecological impacts and economic costs of invasions?
- Who is in control? Who takes decisions? Who determines what to do?
- What is best? Eradication or utilization? Or a combination?
- Precautions against irresponsibility

Slide 14

**Mechanical control**

- Most preferable, especially chopping down and then burning
- Labor and care intensive; tedious but thorough
- Aftercare, especially coppicing remains a problem
- Complete removal seems not desirable and single trees are sometimes left behind

Slide 17

**Economic infrastructure**

- Support from a higher level – regional councils?
- Markets, incentives, creation of jobs, alternative uses, innovation
- More knowledge about products, processing and demands
- A total development strategy –individual, mediocre efforts are uncertain and risky
- Aim at long term, concerted commitments

Slide 15

**What do we need?**

Category	Percentage
More scientific knowledge	34%
Supportive economic infrastructure	39%
Improve genetic diversity	17%
None	10%

Slide 18

**In conclusion**

- When eradicated: combination of methods
- When utilized: economic infrastructure
- When decided: political commitment to concerted efforts

## Working group exercises

### Plenary group: Definitions

This session required a collective brainstorm so that a working definition could be found for the key terms used. It was agreed that the following definitions could be further refined after further consideration by experts within the Biodiversity Programme. It was further agreed that “footnotes” can be used to explain the meaning behind the definition, thus providing further clarification. The use of footnotes is justified in the interests of keeping the actual definition short and to the point.

***Indigenous Species*** is a species that occurs or did occur naturally in Namibia

***Indigenous invasive species*** is a species that occurs naturally in Namibia, but which causes or has the potential to cause, harm to the environment, economies and health

***Alien species*** is a species that does not naturally occur in Namibia, but which has been introduced into the country either directly or indirectly

***Alien invasive species*** is a non-indigenous species which causes or has the potential to cause, harm to the environment, economies and health

After the plenary “brainstorm”, delegates divided themselves into three groups to address the other key objectives set for the workshop. The results of these group discussions appears overleaf.

## **Group 1: Develop and maintain a register of Alien Invasive Species**

### **Statement of objective:**

There are a number of compelling reasons why such a register is essential for Namibia. At an international level, Namibia is required to have a good idea of the distribution and status of alien invasive species because of the country's involvement in the UN Convention on Biodiversity and through our membership of the IUCN. The register is also required to meet the goals of the National Biodiversity Strategy Action Plan. It is widely accepted that a register will assist with the management and monitoring of alien invasive species in Namibia. It is understood that the register is both a list and a database, which is continuously updated.

The group agreed that the following key actions are needed to develop and maintain the register:

<b>Action to be taken</b>	<b>By whom</b>	<b>How</b>	<b>Supported by</b>	<b>When</b>
Appoint coordinator to assume responsibility for Alien Invasive Species issues	Could either by a GRN person/consultant/volunteer. MET will initiate	Second existing official by changing job description or hire new person. If impossible, try for a volunteer	AIWG, MAWRD and MFMR	ASAP
Collate existing knowledge: a) source, clean and update existing data b) Identify gaps	Coordinator	Refer to SAPIA (plant) 1983 Namibia list; BCLME (marine) Museum; herbarium; literature; GBIF and Polytech student projects	NABIF database design & integration; AIWG; SABSP; BIOTA; DRFN  Intersectoral collaboration essential	6 months from now
Initiate new projects/activities that could fill the gaps (e.g. Alien Atlas)	Coordinator	Write proposals and seek funds. Use the Tree Atlas as a model, and make use of volunteers. Prioritize "atlassable" species	Go Green fund, NNF, other donors, GRN funds	ASAP – could start straight away – lasting 3 years
Ongoing data-base management	Coordinator	As data comes in, ensure it is recorded in the correct way	AIWG, GRN ministries, NGOs, public	Ongoing

It should be noted that the above actions are not necessary sequential. For example, MET could (depending on availability of funds) already appoint a short term consultant to assist with writing proposals for the "Alien Invasive Atlas", even though a coordinator is not yet in place.

## Group 2: Enforcing legislation

### Statement of objective

It goes without saying that existing legislation must be implemented, otherwise there is no point in having the legislation, nor in having any programmes aimed at controlling and/or managing the spread of Alien Invasive Species in Namibia.

Action to be taken	By whom	How	Supported by	When
Improve capacity within government agencies regarding <b>legal expertise</b>	Line ministries - MAWRD, MHA, Meat Board, MFMR, MET, MLRR, MHETEC	Appoint experienced legal staff	MOJ. Donors, other stakeholders, LAC	ASAP
Improve capacity within government agencies regarding <b>scientific expertise</b>	Line ministries, UNAM, Polytech	<ul style="list-style-type: none"> <li>Appoint experienced scientists and provide training to all staff.</li> <li>Promote information sharing</li> </ul>	Scientific community, international organisations	ASAP
Improve resources for <b>enforcement</b> within GRN	Line ministries and other stakeholders	Adequate budget allocations and proper accounting	GRN, donors	Ongoing
Improve knowledge regarding legislation	Line ministries, general public, politicians	<ul style="list-style-type: none"> <li>Improve access to legislation</li> <li>Awareness campaigns</li> <li>Popularize laws</li> </ul>	MOJ, MET, LAC	Ongoing
Improve knowledge regarding Alien Invasive Species	Line ministries, general public, politicians	<ul style="list-style-type: none"> <li>Awareness campaigns</li> <li>IEC</li> <li>Relevant case studies</li> </ul>	AISWG, MBESC, MHETEC, UNAM, Polytech (many of whom have websites etc.)	Ongoing
Achieve a common understanding and appreciation of biodiversity	NBP NB Task Force Line Ministries (led by MET)	Establish a permanent inter-ministerial committee on biodiversity (include civil society)	All relevant stakeholders	ASAP - ongoing
Improve communication within GRN and between GRN and other stakeholders	Line ministries (led by MET)	<ul style="list-style-type: none"> <li>Use Parliamentary Committee on Nat. Res.</li> <li>Use Permanent Secretaries joint meetings</li> <li>Establish technical-level inter-GRN forum</li> <li>Generate &amp; use a comprehensive email list</li> <li>Use MET website</li> </ul>	AISWG	ASAP-ongoing
Reduce conflicts between legislation	Line ministries (led by MET)	<ul style="list-style-type: none"> <li>Assess existing legislation for overlaps/conflicts and revise accordingly</li> </ul>	AISWG, MOJ, LAC, other stakeholders	ASAP
Improve enforcement of legislation	Line ministries (led by MET)	Motivate inspectors /rangers/ police by providing support and applying realistic fines	NAMPOL, MOJ, customs officials, LAC, public and other stakeholders	ASAP - ongoing
Improve political will and commitment for controlling Alien Invasive Species	Line ministries (led by MET)	<ul style="list-style-type: none"> <li>Lobby through Parliamentary Committee on Nat. Res.</li> <li>Lobby through Permanent Secretaries joint meetings</li> <li>Provide good information</li> </ul>	Scientists and senior staff from MET, MAWRD, MFMR, UNAM, Poly and other stakeholders	ASAP-ongoing

### Group 3: Control projects

#### Statement of objective:

There is a need to implement projects/activities that succeed in eradicating or controlling Alien Invasive Species without the projects themselves causing environmental harm. Ideally, these projects should be labour intensive (so that they provide employment) and have the ability to generate income (to reduce poverty). Moreover, the projects should be practical and applicable over a wide range of habitats and circumstances. Success breeds success, and good examples of control mechanisms will stimulate others to implement them on their own.

Action to be taken	By whom	How	Supported by	When
Create awareness of the negative impacts of potentially harmful species	AISWG	<ul style="list-style-type: none"> <li>High profile events (e.g. Alien Bashing Day)</li> <li>Young scientist projects</li> <li>School competitions</li> <li>Media articles</li> </ul>	<ul style="list-style-type: none"> <li>Civil Society groups (e.g. Friends of Avis, Scouts, NGOs)</li> <li>City of WHK</li> <li>UNDP</li> <li>NNF-small grants</li> <li>Schools</li> </ul>	Annually – combine with Arbour and Habitat day
Produce good quality, accessible information (e.g. book on Aliens, laminated info. sheets, posters)	MET to lead – might need to contract experts (e.g. Lesley Henderson)	<ul style="list-style-type: none"> <li>Produce text, maps, photo's etc. using existing data sources and knowledgeable people</li> <li>Collect new information/ data (cross ref. group 1 outcome)</li> </ul>	<ul style="list-style-type: none"> <li>MET and other line ministries</li> <li>Local scientists</li> <li>See group 1 outcome for more ideas</li> </ul>	Ongoing – have some key outputs by 2006/7
Raise awareness through producing “funky stuff”, possibly using Prosopis to show the diversity of products that can be produced (e.g. wood, pellets, etc.)	Researchers (though GRN might need to provide kick-start or incentives)	Research, demonstration and information sharing	<ul style="list-style-type: none"> <li>Development Bank of Namibia (could fund pilot projects)</li> <li>USAID (Small &amp; Medium Enterprise grants)</li> <li>Local entrepreneurs</li> </ul>	ASAP
Improve our knowledge of the impacts of Alien Invasive Species	Researchers	Research (e.g. water consumption of Prosopis)	GRN budget Donor funds UNAM/Polytech budget	Ongoing

## **Conclusion**

The delegates expressed their satisfaction with the workshop, noting that the key objectives had been achieved and that a clear plan of action had been agreed upon.

Sem Shikongo officially closed proceedings, again thanking people for their attendance, their time and for sharing their knowledge and insights. He noted the importance of all stakeholders working towards the achievement of a common good and the fact that this had happened during this workshop.