

IMPLEMENTATION OF
INTERNATIONAL
INSTRUMENTS AND POLICY
DEVELOPMENT

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Grande Baie, **Mauritius**

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IMPORTANT ECOSYSTEMS; SPECIES;
TRADITIONAL COMMUNITIES;
STEWARDSHIP/EXPLOITATION OF
RESOURCES; IMPLICATIONS FOR
PROTECTION OF TRADITIONAL
KNOWLEDGE

Important Ecosystems & Species

What is an ecosystem?

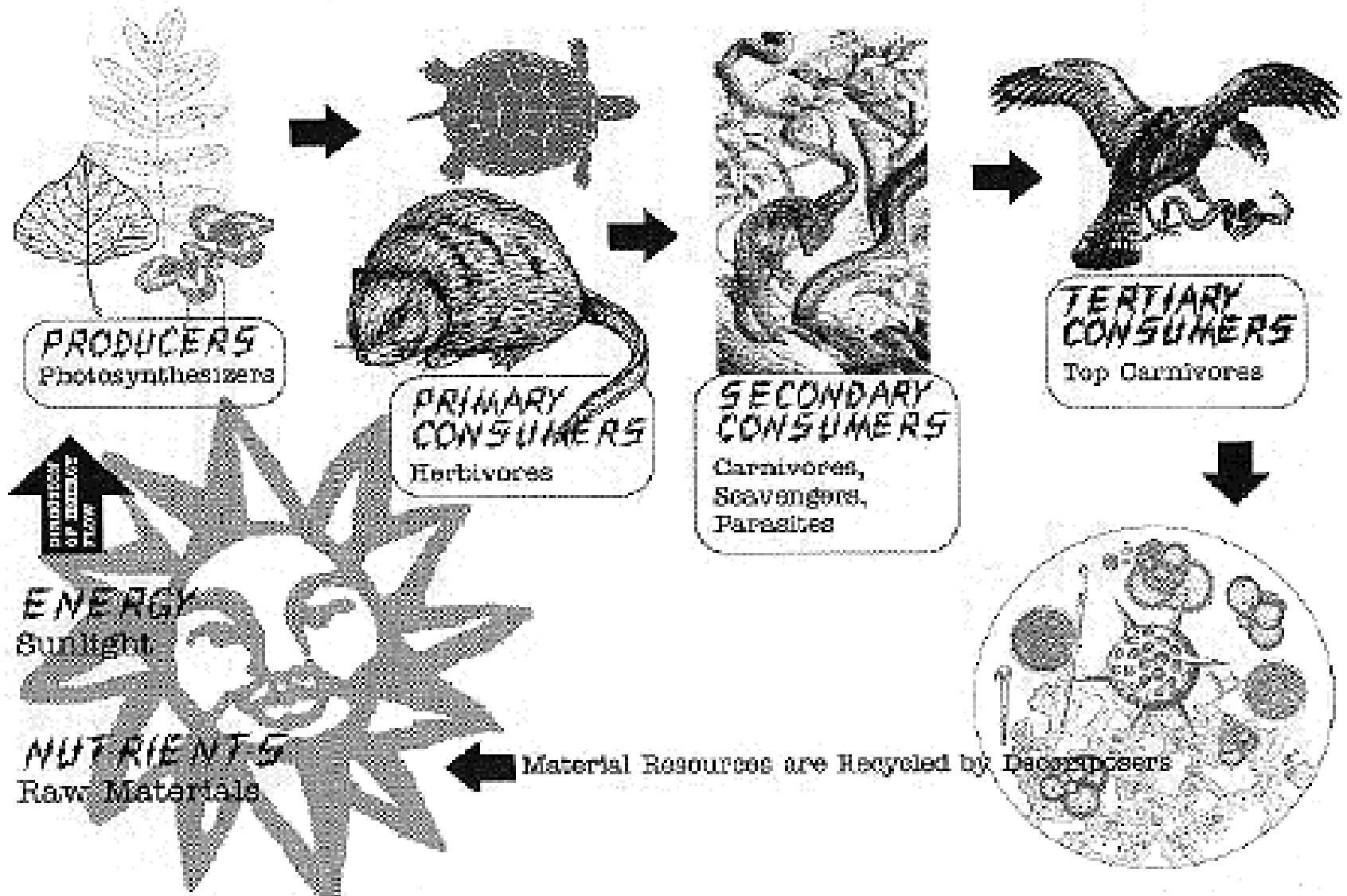
- An **interacting** community of organisms and the physical environment (habitat) that they occupy
- An ecosystem is a system that has the ability to incorporate energy into organic compounds and pass it on to other organisms

e.g. photosynthesis in plants → eaten by animals
→ eaten by carnivorous → decay back to basic elements

Successful ecosystems are able to balance the incorporation, conversion and loss of energy for sustained periods

- If there is a depletion of energy producers or converters the ecosystem becomes unbalanced e.g. the removal of a grass bed deprives a group of animals of its energy source – they may move or reduce in numbers to fit the lower carrying capacity of the area. In turn their predators may have to find other sources of food elsewhere.

ENERGY FLOW Through an Ecosystem



Important Ecosystems & Species

- Ecosystems are not restricted by political boundaries
- Defined broadly by physical characteristics – elevation, temperature, light, water, soil type, nutrient composition; affect the types of communities that develop in/on mountains, forests, deserts, lakes, rivers, craters etc.
- They are identified by characteristics that enable them to exploit specific niches within certain habitats e.g. brine lakes, mangrove forests, lagoons, coral reefs may all be found within a coastal environment which operates as a large complex of smaller ecosystems

Important Ecosystems & Species

MARINE

- **Benguela Current Large Marine Ecosystem** – extends from Angola (Cabinda Province) to South Africa (Port Elizabeth)
 - ✓ about 2-300 km wide of icy water–flows north
 - ✓ Where it meets the warm Agulhas current off the Cape of Good Hope – rich marine ecosystem
 - ✓ Responsible for the coastal desert conditions of Namibia
 - ✓ Important fishery – 1.2 million tons in 1999

Benguel a
Current

Atlantic
Ocean

Cape of
Good Hope

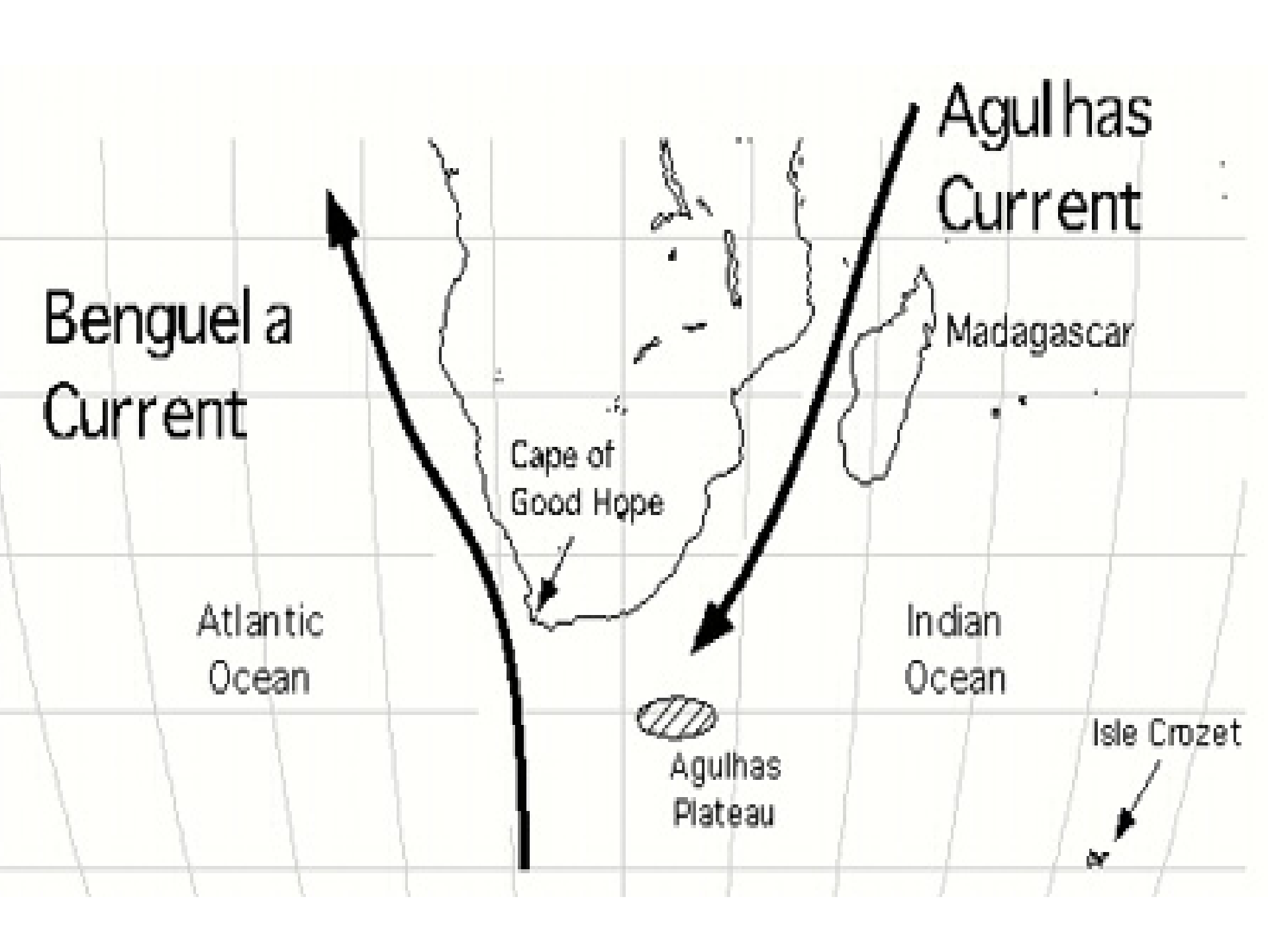
Agulhas
Plateau

Agulhas
Current

Madagascar

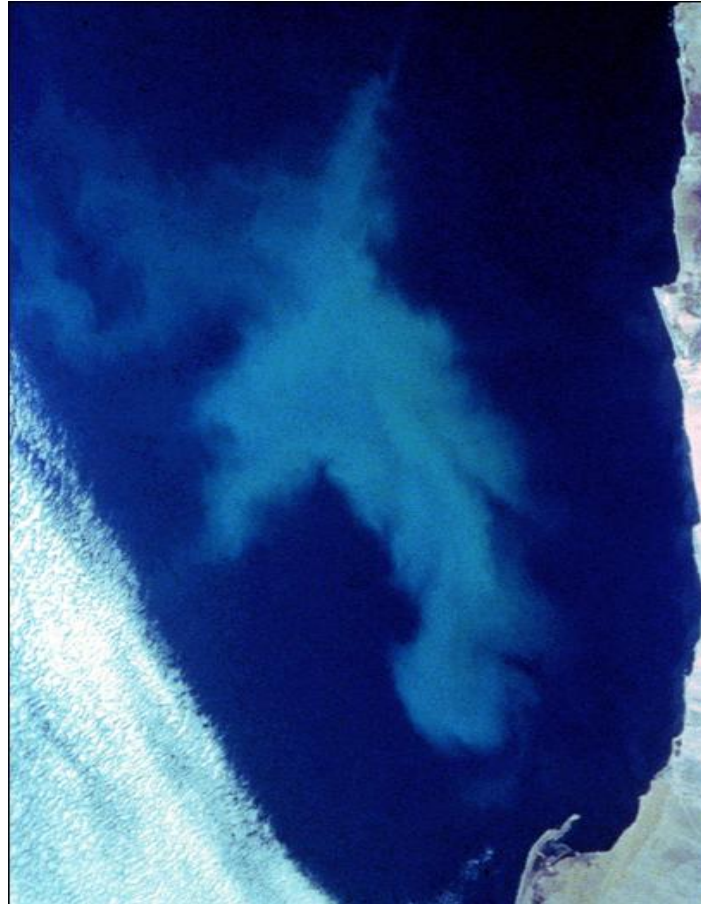
Indian
Ocean

Isle Crozet



Plankton bloom in the Benguela Current

**Unproductive
Atlantic Ocean**



**Coast of
Namibia**

- **Agulhas Current Large Marine Ecosystem** flows south from the Indian Ocean (Madagascar and Mozambique) to Cape Agulhas, South Africa
 - ✓ Warm, narrow, swift and strong
 - ✓ Moderately productive – high degree of biodiversity and endemism (fish)

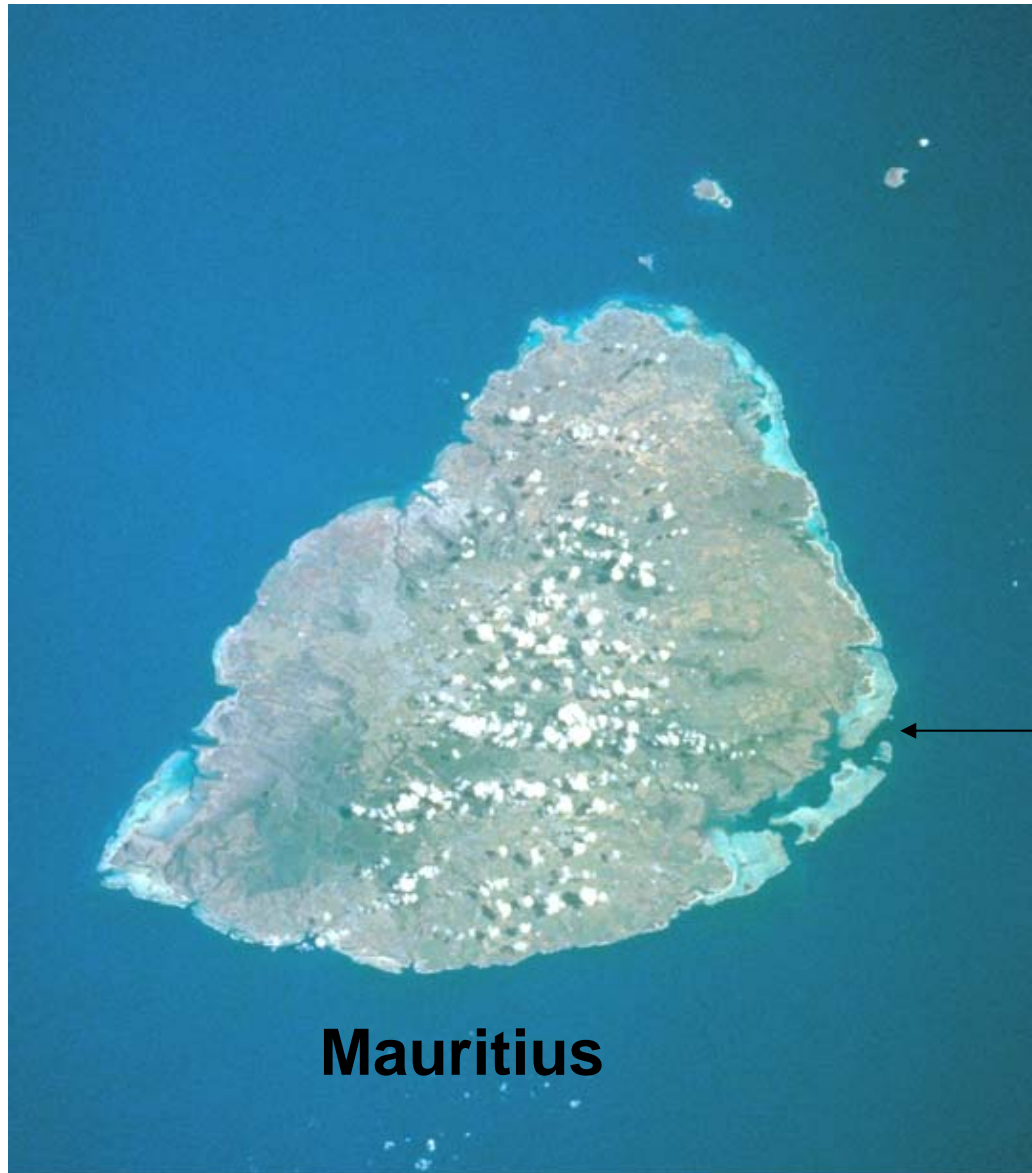
Some important Species

- Herrings, sardines, anchovies important for commercial fisheries
- Whales, turtles, albatrosses

CORAL REEFS

- ✓ 4 main types – fringing, barrier, platform and atoll
- ✓ Found in clear, warm, shallow waters
- ✓ Very diverse and productive communities
- ✓ Provide food and shelter, protect shores from erosion, provide sand for land building

Fringing reef



World Atlas of
Coral Reefs –
Univ. of
California Press

**Barrier
Reef**

Mauritius

Barrier Reef

Mayotte



World Atlas of
Coral Reefs –
Univ. of
California Press

Atoll



Aldabra Atoll – Seychelles (World Heritage Site)

Species

Fish – food and ornamental



WETLANDS

- Okavango Delta (15,000 km²) – river starts in Angola passes through Namibia into Botswana (endangered environment)
- ✓ Habitat for 2-3000 species of plants, over 65 species of fish, 162 arachnids, 450 birds, more than 20 large herbivores (Ramsar Cop 7)
- ✓ The Permanent Okavango river Basin Commission (1994) manages the area



- Bao Bolon (Gambia) – 140 km long valley on the North Bank of the River Gambia – approx. 22,000 ha (extends into Senegal, Ramsar site)
- ✓ 4 distinct ecosystems – estuary, mangrove forest, salt marsh, savannah woodland
- ✓ Important for fishing
- ✓ Home to rare species – e.g. birds – African Fish Eagle; manatee

Species of note:

Birds - bird watching is an important activity for tourists as Gambia has a high bird diversity

River Fisheries – tilapia, catfish, shrimp

DESERT

- Kalahari covers ~ 930,000km²
- Covers parts of Botswana, Namibia, South Africa, Zimbabwe
- Characterised by stable sand dunes – grasses, thorny shrubs, Acacia trees
- Inhabited by the Bushmen (San, Basarwa)
- The Etosha and Makgadikgadi Pans are evaporated lakes – when wet become important breeding grounds for flamingos

- Namib ~ 50 000 km²
- One of the oldest (~80 million yrs) and driest deserts
- Rainfall – 50mm to 150 mm (s) and 560mm in the north
- Complex ecosystem dependent on moisture from fogs that come in from the Atlantic
- Inhabited by the Bushmen (San, Basarwa)
- Famous for its sand dunes – at 300m are the highest in the world

Sand dunes of the Namib





Species:

- ✓ Commercial fisheries species – herring etc.
- ✓ High level of endemic species specially adapted to arid conditions:
 - many reptiles ~ 25 species
 - rodents
 - beetles
- ✓ Most prominent bird – ostrich
- ✓ Fauna – Acacia, lichens, grasses

Etosha Salt Pan



Etosha Pan with water and Flamingos



FOREST

- ✓ Riparian forests of The Gambia – runs for about 100 miles from the sea (~13% of land)
- ✓ Comprised of dense mangrove swamps and woodlands of large trees
- ✓ Source of timber and fuel
- ✓ Nursery for fish

Mangrove Swamp



Species

- Manatee, crocodile, Fish Eagle, migrating birds – Gambia has a vibrant birdwatching tourism industry
- snakes, lizards, baboons, hippopotamus



GRASSLANDS

- ✓ Covers vast expanses of Africa; varied topography, temperatures, vegetation and animals
- ✓ Botswana grasslands
- ✓ Lesotho grasslands





Botswana grassland

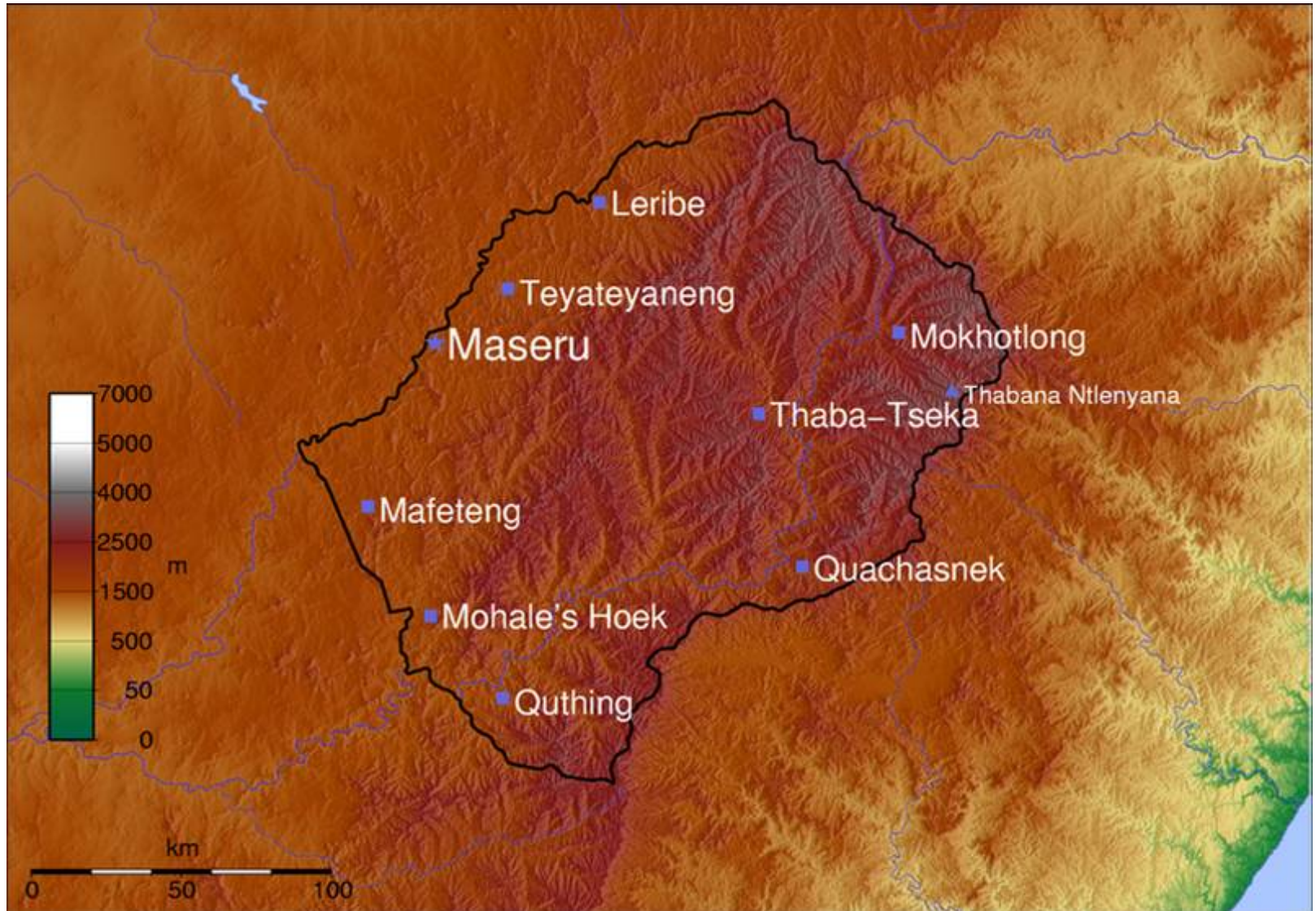


Lesotho grassland

Species

- One of the highest concentrations of species of wildlife in Botswana resulting in vibrant nature tourism
- Elephant – in Botswana successfully managed to recovery ~ at carrying capacity

Mountainous terrain of Lesotho and South Africa



MOUNTAINS

- ✓ Much of Lesotho extending into South Africa and Swaziland
- ✓ Lesotho has a unique Afro-Alpine ecosystem shared with South Africa giving rise to the Maloti-Drakensberg Transfrontier conservation and Development Project (5,170 km² (L) + 2,943 km² (SA))
- ✓ Important watershed

- Invasion of Karoo bush is an environmental issue ~ 12% into the rangeland.
- About 16% of the rangeland is degraded

Traditional (Indigenous) Communities

- A proposed UN working definition:
“ Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them, They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal system.”

THE SAN (Bushmen) – aboriginal people of Southern Africa – Botswana, Namibia, Zambia and Zimbabwe

- ✓ Evidence of presence going back 20 to 30,000 years
- ✓ Hunter gatherers – live on large and small animals, eggs, honey, nuts, berries, roots
- ✓ ~ 100,000 – 120,000 in number

Implications for Protection of Traditional Knowledge

- Humans have over millenia exploited the properties of living and non-living resources within their environment to enhance their existence
- A huge repository of knowledge has developed through trial and error
- Much of which resides in the oral traditions of many indigenous and traditional societies

- The medicinal properties of many plants have been of particular interest for pharmaceutical companies of developed countries
- Mechanisms to protect both the owners of the historical knowledge and the exploitation of the targeted species need to be developed or enhanced

The Bushmen and Hunger

The media have given extensive coverage of the case of the exploitation by western companies of the Hoodia plant used by the Bushmen as an appetite depressant during long hunting trips

Hoodia



- Hoodia pills claiming to have appetite depressing qualities are on sale on various sites on the internet in the West
- The process of transfer of the historical knowledge from the Bushmen to the commercial company/ies, the acquisition of the plant stock and isolation of the active ingredients, sale of the products: What benefits have the Bushmen derived from this?

Stewardship/Exploitation of Resources

- The Region possesses a rich floral and faunal biodiversity alongside a wealth of valuable minerals, metals and other resources such as water
- Inventories of flora and fauna including the taxonomic identification of newly found species should be developed as part of a management system
- Exploiting natural populations such as fish and timber forests require management strategies, monitoring and policing programmes built on the principles of sustainability which must take cognisance of regeneration times of individual species, the pace of recolonisation by dependent species and the management of invasive species likely to disrupt ecosystem stability

- Tourism is an important component of many national development strategies – vested interest in the continued wellbeing of the environment to maintain competitive edge in offerings such as safaris, unique landscapes, unusual activities
- Return land exploited for its mineral wealth to a state where recolonisation by flora and fauna can occur thus reducing the contribution of mined lands to the inventory of degraded lands
- Programmes need to involve and give ownership where appropriate to relevant stakeholders
- Viable alternative solutions need to be tested *in situ* and adapted to suit local situations to gain acceptance by affected communities