

SEYCHELLES

NATIONAL STRATEGY for PLANT CONSERVATION

2005 - 2010



Produced by
Plant Conservation Action Group
and Botanical Garden Section (MENR)
Seychelles, 2005

Designed by: A. Labrosse



The Plant Conservation Action group (PCA)

The PCA is a Non-Governmental Organisation formed in November 2002 with the ultimate mission to further plant conservation in Seychelles by developing a network of conservationists and environmentalists. It also endeavours to act as a reliable source of advice and scientific information to interested parties, with the main goals of promoting awareness about the fundamental importance of plants as the basis of all ecosystems and of mankind's dependence upon their services and products, and to gain support for their conservation.

Its main objectives are:

- To increase the local capacity to provide timely, innovative and practical solutions to conservation problems.
- To offer opportunities for individuals interested in plant conservation to work with similar minded professionals to contribute towards conservation and to be part of a well respected and effective body of experts.
- To provide local plant scientists and other interested parties with the opportunity to do research and to publicise their findings.
- To offer its members access to channels of information in various forms, to current news on topics related to the Species Survival Commission and on plant conservation in general.
- To influence decisions and policies affecting biodiversity recommendations and guidelines based on sound interdisciplinary scientific information.
- To raise funds and establish a sound resource and administrative base to support the activities of the group.
- To set up a local network of conservationists to link up with other regional and international networks.
- To develop protocols of plant conservation and sustainable use based on research and practical experience. These can include management plans for the major alien invasive species that threaten native plants, plant communities and associated habitats and ecosystems.
- To promote education and awareness about Seychelles plant diversity at all levels in the society.

Any interested individual can become a member of the NGO provided he or she accepts the conditions stated under its constitution and enrolls as a member.

The National Botanic Gardens

The Botanic Garden Section is now part of the recently created Division of Nature and Conservation within the Ministry of Environment and Natural Resources. Its aim is to contribute significantly towards the sustainable development of Seychelles through input into conservation, promotion, and research on the endemic, indigenous and other useful flora.

The main objectives of the Section are:

- To promote community awareness and knowledge about plants and their importance for conservation.
- To develop and promote the role of the Botanic Garden as the centre for botanical and horticultural activities.
- To provide tourists with a natural attraction and with comprehensive information about our natural heritage.
- To conserve, research, maintain and develop a diverse, comprehensive and well-documented collection of native plants.

The National Botanic Gardens are a member of the Botanic Garden Conservation International (BGCI).

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The Main Invasive Plant Species in Seychelles

Woody species		Creepers		Herbaceous species	
Latin name	Common name	Latin name	Common name	Latin name	Common name
<i>Paraserianthes falcata</i>	Albizia	<i>Merremia peltata</i>	Lalyann torti, Liane d'argent	<i>Agave sisalana</i>	Sisal, Lalwa
<i>Cinnamomum verum</i>	Cinnamon, Kannel	<i>Thunbergia grandiflora</i>	Thunbergia	<i>Dieffenbachia sequine</i>	Dumb cane, Bwa tang
<i>Psidium cattleianum</i>	Chinese guava, Gouyav de sin	<i>Epipremnum spp.</i>	Filodendron	<i>Stachytarpheta jamaicensis</i> and <i>S. Urticifolia</i>	Zepi ble
<i>Clidemia hirta</i>	Fo watouk	<i>Philodendron spp.</i>	Filodendron	<i>Furcraea foetida</i>	Agave, sisal
<i>Syzygium jambos</i>	Jambosa, Zantroza	<i>Passiflora spp.</i>	Passion fruit, Pok pok, Lepeka	<i>Elettaria cardamomum</i>	Cardamom, Cardamon
<i>Alstonia macrophylla</i>	Bwa zonn	<i>Quisqualis indica</i>	Rangoon creeper, Santoninn	<i>Clerodendrum spp.</i>	Modesti
<i>Chrysobalanus icaco</i>	Cocoplum, Prin de frans	<i>Syngonium podophyllum</i>		<i>Carica papaya</i>	Papaya, Papay, Pawpaw
<i>Pentadesma butyracea</i>	Butternut, Bwa ber	<i>Ipomaea spp.</i>	Railway creeper, Titoupi etc.	<i>Pistia stratiotes</i>	Water lettuce
<i>Dillenia suffruticosa</i>	Bwa rouz blan	<i>Antigonon leptopus</i>	Antigonn, Lalyann koray, Coral vine	<i>Ananus comosus</i>	Wild pineapple, zannannan maron
<i>Tabebuia pallida</i>	Kalisdipap, White cedar				
<i>Ardisia crenata</i>	Christmas tree, Arbre de Noël				
<i>Ardisia elliptica</i>					

Annex 4

Key References and Resource Documents

General

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Foreword

Stemming plant diversity loss is one of the major challenges facing conservationists worldwide today. In Seychelles, plant conservation has, despite many initiatives, somehow always taken a lower priority in relation to the more charismatic local animal species. Most of our efforts were done in an ad hoc manner, and there was a real need for a more consistent and integrated approach to meet existing and emerging challenges.

The National Strategy for Plant Conservation is thus an important milestone in providing botanists with the right tool to address plant conservation issues. It is another step forward for Seychelles towards the implementation of its national obligations under the Convention for Biological Diversity (CBD).

I am especially proud to note this is a first for small island states, and I wish to congratulate all those who have actively participated in, and contributed to this initiative. The Ministry of Environment and Natural Resources not only supports the strategy, but, as with other similar national initiatives, is committed to its successful implementation.



Ronny Jumeau, Minister for Environment and Natural Resources



Annex 3

List of Workshop Participants and Organisations

Government

Didier Dogley	Nature & Conservation Division (MENR)
Selby Remie	Conservation Section (MENR)
Cliff Alissop	National Parks & Forestry Section (MENR)
Terence Athanase	National Parks & Forestry Section (MENR)
Jacques Barreau	National Parks & Forestry Section (MENR)
Terence Belle	National Parks & Forestry Section (MENR)
Simon Dogley	National Parks & Forestry Section (MENR)
Basil Esther	National Parks & Forestry Section (MENR)
Michel Vielle	National Parks & Forestry Section (MENR)
Peter Volcère	National Parks & Forestry Section (MENR)
Walter Mangroo	Botanical Garden Section (MENR)
Denis Matatiken	Botanical Garden Section (MENR)
James Mougat	Botanical Garden Section (MENR)
Brian Anderson	Landscape Management Division (MENR)
Mermedah Moustache	Plant Genetic Resources (MENR)
S Ravindran	Plant Protection (MENR)
Marie-May Tirant	Natural History Museum (MLGSC)
Jeanette Larue	Ministry of Education & Youth
Frauke Fleischer-Dogley	Ministry of Tourism & Transport
Sheila Léon	Ministry of Tourism & Transport
C Port Louis	Trades Tax Division

NGOs and parastatals

Katy Beaver	Plant Conservation Action group
Christoph Kueffer	Plant Conservation Action group
Eva Schumacher	Plant Conservation Action group
Colleen Morel	Nature Seychelles
Terence Vel	Wildlife Clubs of Seychelles
Antoine Vital	NATCOF
Lindsay Chong-Seng	Seychelles Islands Foundation
Allen Cedras	SCMRT/MPA

Private sector

Patrick Bonne	Island Scent Distillery
Jon Duncan	North Island Resort
Steve Hill	Fregate Island Resort

External facilitators

Peter Wyse Jackson	BGCI secretariat
Stella Simiyu	BGCI secretariat

Additional Contributors to the Review process

Rolph Payet	Environment Department (MENR)
Jo Faure	Environment Department (MENR)
Juliet Rose	Eden Project

Message of Support



I congratulate the Plant Conservation Action group, the Ministry of Environment and all those involved in the development of this innovative new plan. Having been developed through wide consultation and the active participation of representatives from all relevant sectors in the Seychelles, including government ministries, the private sector and leading non governmental organisations, I have no doubt that it provides an excellent consensual basis for the implementation of new coordinated efforts to ensure the survival of the unique flora of the Seychelles. As the first such national plant conservation for a small island state anywhere in the world, this Strategy should also provide an essential model for many other countries that I would urge to adopt a similar approach to determining their plant conservation priorities and proposals for their achievement.

Peter S. Wyse Jackson, Secretary General, Botanic Gardens Conservation International, and Interim Chairman, Global Partnership for Plant Conservation.

The Global Strategy for Plant Conservation (GSPC) was adopted by the Convention on Biological Diversity in April 2002 at its 6th Conference of the Parties. Its objective is to halt the loss of plant diversity worldwide. It has been recognised that up to 100,000 plant species are currently threatened and so urgent new initiatives are required throughout the world to prevent the loss of such a significant component of the world's biodiversity. Plant conservation is now well recognised as an important international priority. Without plants there could be no life on Earth. They form the basis for most terrestrial habitats. They provide for food, fibres, timbers, medicines and so many other vital resources for human use. Despite significant efforts being made in many countries, plant diversity is still being lost through a range of factors including natural habitat destruction, unsustainable exploitation and inappropriate development.

The GSPC includes a series of innovative targets to be achieved by 2010, the first such targets for the conservation of biodiversity adopted by the international community. These targets clearly specify what conservation outcomes need to be achieved by 2010. These targets are ambitious but achievable if efforts are made to ensure that coordinated and effective new plant conservation programmes are developed and implemented by each country directed towards conserving the most threatened plants and their habitats.

The development of this National Strategy for Plant Conservation for the Republic of the Seychelles is therefore greatly welcomed. The native flora of the Seychelles is well recognised for its unique and diverse nature. Some remarkable species occur, ancient remnants of the Gondwanaland flora, such as *Medusagyne oppositifolia*, the jellyfish tree, highly threatened and the only member of its own family, the Medusagynaceae, or *Lodoicea maldivica*, the coco de mer or double coconut. Conservation of these and many more unique plants represents not only an important priority for the Seychelles but also, for their international scientific significance, as a part of our global floral heritage. The adoption of the clear and focussed national targets is very welcome to help ensure that the Strategy is not just a statement of worthy aspirations but includes clear commitments to delivering its objectives and monitoring their achievement.

As in most countries, many plant species are under serious threat in the Seychelles. Island ecosystems are well recognised as intrinsically vulnerable. Their plant populations are often small in number and extent and increasingly threatened by biological invasions of alien plants, animals and pathogens and other factors such as the loss of pollinators and increasingly through climate change. This national strategy for plant conservation seeks to address these issues in holistic way, applying complementary approaches to find solutions to the challenging plant conservation tasks ahead.

Annex 2 Targets and Contributing Organisations / Groups

The organisations listed here are the expected contributors to actions supporting the National Strategy for Plant Conservation in Seychelles

Objective:	1. Documentation / Research			2. Conserving Plant Diversity			3. Wise Use		4. Education and Awareness		5. Capacity Building			
Organisation	Target 1	Target 2	Target 3	Target 4	Target 5	Target 6	Target 7	Target 8	Target 9	Target 10	Target 11	Target 12	Target 13	Target 14
M/E (Conservation, Forestry, PPS, Landscape, Education)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
M/NR (Agriculture, Plant Protection)	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
Bot. Gardens + Biodiversity Centre	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Natural Hist. Museum	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ministry of Education								✓	✓	✓	✓	✓	✓	✓
Other Ministries					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Media (TV, newspapers)	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
P.C.A. group	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Other NGOs (NS, WCS, NPFS, ICS, SIF, Med Pl.)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Private Sector	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private Islands and Individuals	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
E.T.F.				✓			✓	✓	✓	✓	✓	✓	✓	✓
International organisations (Eden, Geobot. Zurich, GISP etc.)	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓

Other possible: IDC, MLUH, Landscape section, Praslin DF, Min of Tourism, Customs, Meteo, Local Government

Group D: **Promoting Education and Awareness about Plant Diversity**

Group E: **Building Capacity for the Conservation of Plant Diversity**

A team leader was elected for each group, together with a rapporteur to write the outcomes of the group discussion (a laptop was used per group to facilitate the presentation) and a presenter.

The groups were given a time frame based on the preliminary findings: 1 hr 30 minutes for group discussion, 10 minutes for presentation of their findings, 5 minutes for other workshop participants to make contributions.

Day Two (morning session)

- A brief introduction to the results of the SWOT analysis from the previous day, as a basis for formulating the targets.
- Detailed explanation on how to formulate the targets, emphasizing that the targets must be **SMART**: **S**- specific, **M**- measurable, **A**- attainable/achievable, **R**- relevant/realistic, **T**- time-bound/with a time frame.
- Presentation of some possible targets based on the SWOT analysis, by the workshop session moderators.
- Re-formation of the same groups as on the previous day.
- Brief review of their findings from the SWOT analysis before proceeding to the formulation of targets.
- Each group formulated targets for the different aspects of the GSPC objective that they worked on.
eg. **Understanding and Documenting Plant Diversity'**
i) Document the plant diversity of Seychelles
Target: **Establish a widely accessible & comprehensive information resource on the plant diversity of Seychelles.**
- Each group had to formulate four to five targets. The target had to address one or more needs established in the SWOT analysis.

Day Two (afternoon session)

- Continuation with the formulation of targets.
- Presentation of the targets by the different groups for discussion by the other participants.
- A final address by the PCA chairman to close the workshop.

Aftermath of the workshop: "Formulation of the National Strategy for Plant Conservation"

- The following day a small group comprising of PCA members, MENR staff and the two BGCI facilitators reviewed the different targets and came up with a first draft of the National Strategy for Plant Conservation.
- The draft was sent to all the workshop participants and other persons with a particular interest in plants, for their comments, including MENR, environmental NGOs, Eden Project (UK), Geobotanical Institute of ETH (Zurich).
- PCA members went through the comments and amendments, discussed further and proceeded with the final draft of the National Strategy for Plant Conservation.



How the Strategy was Developed

Preliminary meeting to discuss the workshop

- Prior discussion among the Plant Conservation Action group (PCA) members and Botanical Gardens staff on the purpose and expected outcomes of the workshop.
- Further dialogue with the Ministry of Environment and Natural Resources (MENR) and PCA friends from international organisations or institutions on the technical aspects of the workshop and on how they could contribute.
- Preparation of the programmes and schedule for the workshop plus all the logistics and establishment of necessary contacts.
- Identification of key stakeholders and organisations or individuals with interest in plant conservation in Seychelles for invitation to the workshop.
- Brainstorming exercise to test the SWOT analysis method and establish processes and the time frame for the workshop.

Proceedings of the workshop

Day One (morning session)

- Introduction to the workshop: Opening remarks by PCA chairman and BGCI general secretary.
- Launching of the workshop by MENR Minister.
- A general overview of Plant Conservation in Seychelles by two representatives from the Nature and Conservation Division (MENR), with emphasis on protected areas (in situ conservation) and development of the national Biodiversity Centre (ex situ conservation) plus forging partnerships and linkages with other institutions for capacity building.
- An introduction to the new NGO, Plant Conservation Action group (PCA) by its chairman: its aims and purpose and the reason for such a workshop, the benefits to Seychelles of having a **National Strategy for Plant Conservation**.
- An introduction to the Global Strategy for Plant Conservation by BGCI General Secretary: the necessity for each country to develop its own national plant conservation strategy specific to address the needs of that country.

Day One (afternoon session)

- Group formation (6-8 persons per group): participants could join any group based on their personal interest, professional background or the institutions they represent.
- Introduction to the **SWOT analysis** process by the moderator: "Identification of the **Strengths, Weaknesses** or gaps, the **Opportunities** that exist and possible **Threats** to plant conservation in Seychelles".
- Each group worked on one of the five main objectives in the Global Strategy for Plant Conservation:

Group A: **Understanding and Documenting Plant Diversity**
 Group B: **Conserving Plant Diversity**
 Group C: **Using Plant Diversity Sustainably**

Acknowledgements

The National Plant Conservation Strategy was developed at a national workshop organised jointly by the Plant Conservation Action group (PCA) and the Botanical Garden Section of the Ministry of Environment and Natural Resources (MENR) on the 17th and 18th March 2004 at the International Conference Centre, Mahé. Workshop organisers and moderators were Didier Dogley, Denis Matatiken, Katy Beaver, Lindsay Chong-Seng, Frauke Fleischer-Dogley, Christoph Kueffer, James Mougall and Eva Schumacher.

Special thanks go to the facilitators of the workshop: Dr. Peter Wyse Jackson, Secretary General of Botanic Gardens Conservation International (BGCI), and Mrs. Stella Simiyu, Programme Officer at the CBD Secretariat for the implementation of the Global Strategy for Plant Conservation. Thanks also go to the members of PCA and MENR and to all relevant stakeholders who participated in the development of the National Strategy. Without their input the strategy would not have got off the ground.

The strategy is based upon contributions made by the various stakeholders, consisting of representatives from Government, Non-Governmental Organisations, the private sector and also private individuals, at the National Workshop and in a follow-up review process. It has been edited by Katy Beaver and Christoph Kueffer with the assistance of the organising committee.

The Plant Conservation Action group and the Botanic Garden wish to acknowledge the financial and/or technical support of the following organizations: The Ministry of Environment and Natural Resources, The Ministry of Tourism and Transport, Botanic Gardens Conservation International, Sunrise Hotel, Cerf Island Marine Park Resort, KPMG Pool and Patel, and Seychelles Islands Foundation.



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Introduction

What is special about Seychelles' plant biodiversity?

Plants are fundamental to our lives. Think of the many uses we humans have for plants - as food (fruits, vegetables, rice, etc.), timber, fuel, fibres (cotton, rope, etc.), medicines, spices, oils, tools, equipment and crafts (axe handles, fish traps, baskets, mats, etc.), as well as beautifying our houses and gardens.

Think also of the cultural importance of some of our native plants - Coco-de-mer, Latannien Fey (for thatching), Palmis (the original palm heart), Fouzer Maryaz (wedding decoration), Bwa Zoliker (medicine). And since settlement of the granitic islands, introduced plants such as Coconut, Vanilla and Cinnamon have been important for our economy. The varieties of food plants that were introduced in the early years have been vital for our survival, and so have introduced medicinal plants such as Zepible, Koket, Gerivit and Rozanmer.

We all need to eat plant material to stay healthy, but there are only a few native plants that are edible (examples are Kreson Lanmar, Bodanmyen nuts), so almost all our food plants have had to be introduced. This variety of fruits, vegetables and root crops (gro manze) provides us with essential vitamins, minerals and fibre. Farmers who grow these plants tend to opt for new improved varieties that provide higher yields or are resistant to pests or disease. As a result, the older varieties tend to be neglected. But these varieties are important because they provide just that, variety! For example different crop varieties may have different tastes and qualities, may flower and fruit at different times, or grow better in certain soil types, or show resistance to other diseases. We must not lose this variety, especially in the face of changing climate, as these varieties may possess some other characteristics that help them to survive in the changed conditions.

Plants also provide us with what we call "ecosystem services", which help to maintain a healthy and fully functioning environment. Examples are: mist forest plants (including mosses and ferns) helping to trap water from mist and cloud; beach vegetation holding beach sand firmly and thereby reducing coastal erosion; forest trees holding and protecting soil and maintaining its fertility and water content; marsh plants helping to trap sediments and filter water; and mangrove trees forming a protection for some of our coastlines. Plants perform these tasks naturally and freely - so we don't need to use expensive engineering solutions.



Annex I

Background to the Development of the Strategy

The Global perspective and Seychelles response

The Convention on Biological Diversity (CBD) is the world's most valuable international convention for the flora and fauna of our Earth. It recognises "the importance of biological diversity for [...] maintaining life sustaining systems of the biosphere." Seychelles was the second country to sign this convention and is committed to its implementation. Under Article 6, all countries must develop national strategies for the conservation and sustainable use of biological diversity and in 1997 Seychelles produced a **National Biodiversity Strategy and Action Plan (NBSAP)** with 12 major goals relating to conservation, sustainable use, research, education and awareness, minimising threats and evaluating technology. Thirty eight projects were described, some of which are still on-going. Of these projects only five are directly related to plants, even though several others relate to habitat conservation, which helps both plants and animals. In addition, the **Environmental Management Plan of Seychelles 2000-2010**, which is a comprehensive national development plan, contains a number of important programmes that relate to plants. However, again almost all are habitat-related (e.g. forest biodiversity, outer island biodiversity) or general (e.g. alien species control, setting up a Biodiversity Centre). Nevertheless, there is provision for control of invasive plants in key habitats, ex situ plant conservation, development of links with botanical gardens and training botanists/taxonomists.

Other people must have come across a similar lack of emphasis on plants, so in 2002, when the CBD parties met for the sixth time, they adopted a **Global Strategy for Plant Conservation (GSPC)**, which would help to significantly reduce the current and continuing loss of plant diversity. Seychelles at once took up the challenge to develop a national strategy for plant conservation. Our small country is amongst the first few countries to do so, and as far as we know, the first small island state to develop our programme for plants: the **National Strategy for Plant Conservation (NSPC) of 2004**. The global strategy is a challenging programme which includes 16 targets with specific outcomes to achieve by 2010. These targets are grouped into five overall objectives, which have been used as a basis for the development of the Seychelles strategy.

The emphasis recently has been on an integrated ecosystem approach to large environmental projects and it is hoped that the NSPC will link closely with the existing programmes outlined above and other planned projects such as the new PDF B/GEF funded project on Mainstreaming Biodiversity in Production Landscapes and Sectors.



In Seychelles there are many different natural habitats where plant and animal biodiversity can thrive, on both the granitic islands and the outer coralline islands. Seychelles granitic islands are unique because of their ancient origin, extending back millions of years when they were part of the slowly splitting super-continent, Gondwana. A lengthy period of isolation in the middle of an ocean resulted in the evolution of unique plants, found nowhere else in the world. There are close to 200 species of native flowering plants in the granitic islands, of which about 75 are endemic species and subspecies. This uniqueness extends to a proportion of the smaller plants like ferns, mosses and lichens that grow on rocks, tree trunks, soil and even on the leaves of other plants. On the outer islands, particularly the Aldabra group, there are about 180 species of native flowering plants. This richness is unusual for coral atolls and arises because Aldabra is a large raised atoll and has a greater variety of inland habitats. However, relatively few of Aldabra's plant species are now considered to be endemic at the species level, partly because of the much more recent origin of the coralline islands. Even though the actual number of endemic species in the Seychelles flora is relatively small compared with say tropical Indonesia or the Brazilian rainforest, it is nevertheless highly significant within the global flora.

Plants are the basis for all animal life. A rich variety of plants will support a rich variety of animals. Understanding, valuing and conserving our rich flora is therefore important. Further research can help us to understand the evolution of island flora, as well as the relationships between island plants and animals. For example, we have little knowledge about the smaller Seychelles plants - mosses, liverworts, ferns and lichens and their significant role in the environment. We also need to elucidate the relationships between our endemic plants and the small animals which live amongst their foliage - how much do they depend on each other for food or places to live or reproduction? If native plants disappear or become very rare, the insect species that rely on them will disappear too. And just suppose an endemic insect that pollinates one of our rare plants vanishes because of insecticide use - the rare plant will become extinct too!

A note should be added here about fungi. Although they are not considered true plants, fungi are very closely connected to plants. Their role as decomposers of organic matter and recyclers par excellence is well known. Their close relationship with forest trees and orchid seeds is only now being appreciated. Unfortunately the only fungi we know much about in Seychelles are the tiny ones that cause crop diseases and the even tinier ones (called yeasts) that are used by bakers and brewers! However, most people are familiar with common toadstools or mushrooms, which are the fruiting bodies of fungi. Fungi are therefore included in the Strategy for Plant Conservation because they would otherwise get ignored in conservation issues.

Why does Seychelles need a Strategy for Plant Conservation?

Humans have had a huge impact on the flora of Seychelles - first by exploitation (particularly of timber trees), then by destruction of habitats (for agriculture, plantations, housing, etc.), and also through the introduction of new plant and animal species, some of which have spread and replaced native vegetation. Guano mining on the outer islands, followed by coconut plantations, resulted in almost total destruction of the natural vegetation on some islands. As a result, only small fragments of our natural vegetation remain, and even these have been invaded by introduced species. And yet Seychelles still remains what we call a "biodiversity hotspot", with very special vegetation and species which are unique because of the unusual and ancient origin of our isolated granitic islands and the remoteness and large size of some of the remote raised atolls, such as Aldabra.

Isn't Seychelles already doing a lot for the environment? Of course, yes. The last 50 years or so have seen considerable attempts to restore forest, reduce the further destruction of other habitats and set aside areas for conservation. Approximately 45% of our land is now under some form of protection. Seychelles already has an active Ministry of Environment and Natural Resources (MENR) and an active NGO sector and our institutional capacity is growing. We also have an Environmental Management Plan (EMPS) and a Biodiversity Strategy and Action Plan (NBSAP) (Seychelles was one of the first countries to develop both of these important planning documents). But this doesn't mean we can sit back and relax!



Just as an example, to our knowledge there is (interestingly) not a single Seychellois graduate botanist! We have horticulturalists, foresters, agronomists, environmentalists, zoologists and graduates who have studied botany as part of their degree, but no botanist. Does this reflect a lack of interest in plants? Not at all - think of all the Seychellois who care for their gardens! In addition there are many people who know much about plants. There are many people who care about plants. Increasingly, plant conservation has become an inter-agency affair, with people from different departments (e.g. tourism, agriculture, nature conservation, forestry, horticulture, customs), NGOs and private islands being involved. Private individuals can also play a very important role. The Strategy functions as a binding element between them all.

Many endemic plant species have suffered in the past from habitat loss caused by land development. At present the main threat comes from the spread of alien (non-native) invasive species, brought in for instance as ornamental plants for our gardens and now spreading out of control. New pests and diseases also continue to arrive in Seychelles. A future challenge is that of climate change and we do not know exactly how this will affect our natural habitats and the plants within them. Non-native plants may even grow much faster in the changed conditions. Island floras and faunas are always more vulnerable than those of continental areas because they are isolated and have nowhere to go if conditions change on the islands.

So Seychelles is amongst the first countries responding to the call of the Convention on Biological Diversity (CBD) to prepare a National Strategy for Plant Conservation (NSPC). We must build on our environmental reputation and capacity and ensure that plants get as much priority as endemic birds. After all, life depends on plants!

Further background to the development of the strategy and the methodology used for this process are described in Annex I.

The Seychelles plant conservation targets

As you will see in this strategy, the targets for plant conservation are concerned not only with the protection of threatened endemic plants but with many other aspects of plant life, such as understanding more about plant habitats, the threat from alien plants and how to deal with this and prevent new invaders. The sustainable use of native plants required for medicine and craftwork is also considered, and education and awareness about native plants. And as usual, legal aspects are considered, along with capacity development, in terms both of training and employing people and of finance. The time scale for this strategy is between now and 2010, which is the date also given for the global strategy to have achieved its targets. The Seychelles targets were developed using the 5 main objectives of the global strategy:



The workshop to develop this strategy brought together individuals from government, NGOs and the private sector. Networking will help to coordinate the necessary actions for plant conservation.

Between now and 2010

There are already existing networks such as National Invasive Species Committee, National Parks Committee and National Eco-tourism Committee. Part of the strengthening of current networks could come from web-based dissemination of information, which will make it easier to distribute information and could also act as a "shop window" to the outside world (see Target 9). It will provide information/success stories to potential organisations and individuals who might be able to contribute or collaborate with the implementation of the strategy in some way. In this way the target will help with Target 13. Regional networking can play a role by increasing the flow and exchange of information and experience. New ideas are critical for involving people such as farmers, nature lovers, herbalists, artists, home gardeners etc. in the implementation of the strategy. This involves the creation of a platform for the sharing of experiences. This target links also with Target 1 in that centralisation of plant information will enable wider dissemination through networks.

In the future

It will be important to broaden the network without subdividing it too much, given the low capacity. It will also be necessary to ensure that the emphasis is always on actions rather than on meetings!



Seychelles vegetation the focus of this strategy for plant conservation.



TARGET 14:

National network strengthened

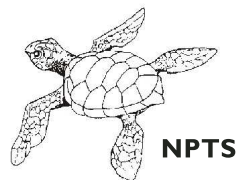
Strengthen a broad-based national network for plant conservation as required to achieve the targets of the National Plant Conservation Strategy.

Scope of this target

Much work is required in order to achieve the targets of this strategy and many players will be required, both committed individuals and organisations of various kinds. Networking helps to co-ordinate activities and also people, and can keep them interested and motivated. It can also help in measuring progress on the strategy targets (refer to page 11 of the Introduction). It will be important to share resources and information, as cooperation will bring synergies otherwise impossible because of our small capacity. And since Seychelles is a small country, it should be manageable.

Current situation

There are 6 environmental NGOs in Seychelles at present, including the PCA which is focussed on plant conservation. However, little sharing of knowledge, experience and expertise takes place, except indirectly through participation in stakeholder meetings. Some of the NGOs already have websites and all produce newsletters (often in digital format as well as printed) and other publications. However, each tends to act in isolation. Islands such as Fregate, Cousin, North and D'Arros are possible new players with resources, and they sometimes participate in stakeholder meetings. Partnerships with NGOs are slowly being formulated in some fields.



Logos of some of the many players who can be involved in the implementation of this strategy.

- Objective 1: Understanding and Documenting Plant Diversity
- Objective 2: Conserving Plant Diversity
- Objective 3: Using Plant Diversity Sustainably
- Objective 4: Promoting Education and Awareness about Plant Diversity
- Objective 5: Building Capacity for the Conservation of Plant Diversity

The Seychelles Plant Conservation Strategy has 14 targets, summarised on the pages which follow. Each target shows how Seychelles can respond to the global challenge and help to achieve the five main objectives within the coming years. For each of the targets, the heading in the top left corner indicates how that target relates to the five global objectives.

Almost all of the 14 targets have sub-targets, which are shown in boxes on the left side of the page.

For each target the following information is given:

- **Scope of this target** - this shows what challenges exist and what the target is trying to achieve.
- **Current situation** - this explains what actions are already being carried out in relation to the target, which will help in achieving it.
- **Between now and 2010** - this indicates the actions that need to be undertaken to meet the challenge of the target and the various sub-targets. Many of the latter have a date by which they should be completed. These challenges will be taken up by a variety of organisations and institutions (see the Table on page 44).
- **In the future** - this gives the long-term perspective for the target in terms of plant conservation.

With respect to priorities in Seychelles Strategy for Plant Conservation, the sub-targets (and the dates by which they should be achieved) define the areas of most immediate concern. Certain actions require completion before the next can take place. Perhaps it is important to note that most actions relate to flowering plants - the giants and flag-bearers of the plant world - and to the granitic islands. These are our priority because we know most about them. As our knowledge improves and people are trained, so will our ability to focus on the smaller plants and the outer islands, although it is good to note that action is already taking place in both of these areas of study and conservation.

Implementation of the Strategy

No one organisation or institution can possibly do all that is required by this strategy. The strategy itself was a collaborative effort, with more than 30 people interested in plants and plant conservation issues coming together in a two day workshop to initiate, discuss and draft the targets. The final wording of the targets has then been dependent on further consultations and discussions among many of

these people (see Annex 1 and Annex 3). Many agencies and individuals will be required to take up the separate sub-targets and in many cases several collaborative efforts will be necessary. A Table on page 44 (Annex 2) summarises the agencies that are expected to play a role in meeting each of the 14 targets. Success will depend on the formation of new partnerships as well as reinforcing old ones. Networking will become a vital tool for linking the various players and regular annual meetings of the main players will be important for the review of progress on each sub-target. Most sub-targets are fairly specific with a defined outcome, so further indicators of success will not be necessary. Seychelles is obliged to report on progress with the implementation of its part in the Global Strategy for Plant Conservation to CBD meetings in 2006 and 2010.

A formal framework needs to be set up (see also Target 14), to ensure that the implementation of targets and sub-targets is 'on track'. This will require:

- an active steering committee with regular meetings,
- a clear and transparent reporting mechanism,
- an annual evaluation workshop to which all stakeholders are invited, to review progress on all the different targets.

OBJECTIVE I:
Understanding and Documenting Plant Diversity



TARGET I:

Furthering our knowledge of Seychelles' plant diversity

Sub-target Ia: National database for flowering plants

Update and/or establish a national database on the in situ and ex situ conservation status of flowering plants of Seychelles by 2005.

Sub-target Ib: National database for ferns

Establish a national database on the in situ and ex situ conservation status of ferns of Seychelles by 2010.

Sub-target Ic: Illustrated guide to native plants

Prepare and disseminate a general illustrated guide on native plants by 2008 and ensure that existing resources are reprinted and disseminated.

Sub-target Id: Atlas of important plant areas

Publish an Atlas of Important Plant Areas by 2008.

Sub-target Ie: Improving access to information

Gather, compile and facilitate access to publications and information relevant to Seychelles flora and its conservation.



Illustrated books help us to learn about plants.

Establish a widely accessible and comprehensive information resource on the Seychelles plant diversity with a focus on dicotyledons, monocotyledons and ferns.

Scope of this target

A database for flowering plants and ferns gives us not only a checklist of species in Seychelles but also basic information about them - taxonomy, descriptions, basic ecology, distribution and so on. This is an important tool for conservation and management actions. It is also important to know where populations of native plants are growing naturally (in situ) and which ones are planted in nurseries or Botanical Gardens (ex situ). Target I focuses on flowering plants and ferns because we do not currently have the capacity to produce databases for smaller plants such as mosses, lichens and fungi, nor for marine algae (seaweeds).

Information also needs to be readily available for all who need it, whether conservationists, managers, planners, scientists or teachers, as well as to lay people (therefore this target links with Targets 9 and 10).

Current situation

Flowering plants are relatively well known on the granitic islands and islands such as Aldabra. Checklists and books are available (if not currently in print). Work on ferns is on-going, as is some work on smaller plants but no checklists or keys are yet available, nor a definitive database. The National Herbarium is a good resource but is incomplete. The National Archives has many past scientific papers and reports but some significant publications are absent and much information is scattered or held in private collections. Plant books are often scientific, expensive, out of print or not readily available.



We need to know more about the smaller mist forest plants.

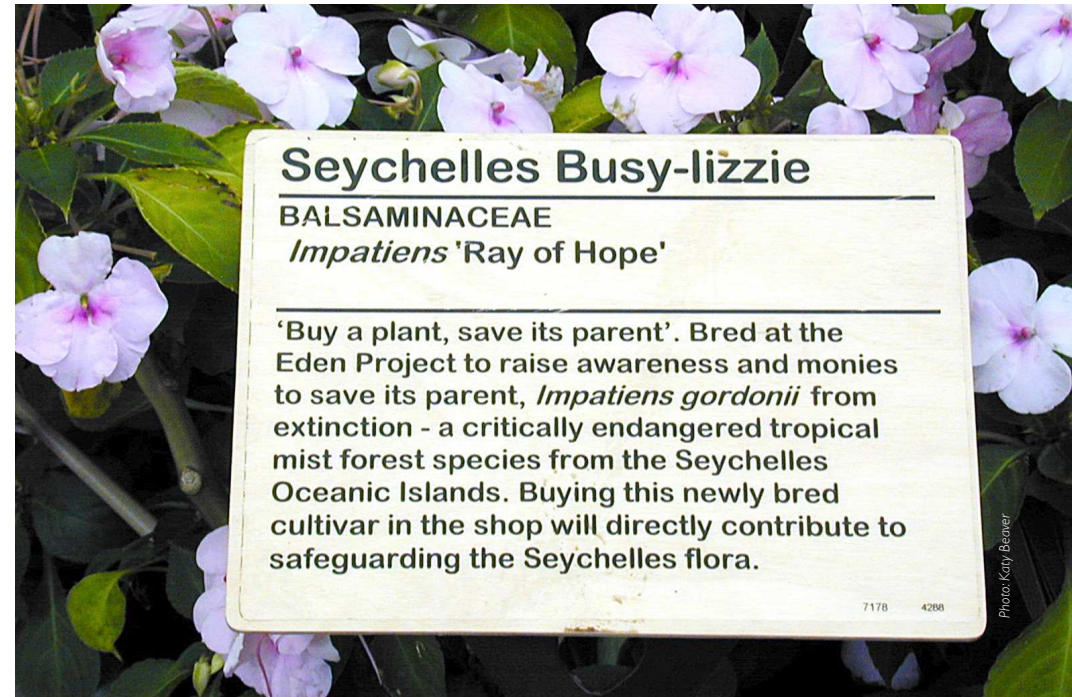


Photo: Katy Beauer

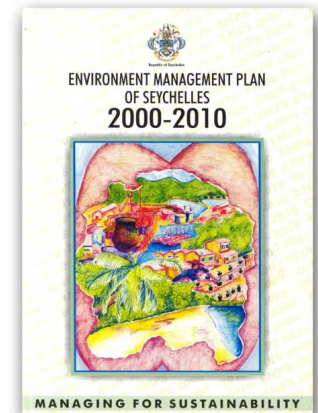
One example of how partnerships can assist in raising money for local plant conservation.

Between now and 2010

In order to achieve Sub Target 13a it will be necessary to prepare an action plan for the Strategy in which the targets are translated into programmes and projects. Possible sources of funding will then need to be investigated. Government can provide some finance, together with facilities (as in-kind contributions). One requirement is to ensure that plant conservation issues and capacity needs are included in national large scale environment projects. The capacity needs are also dealt with under Target 12. Partnerships between government and environmental NGOs with research and/or tertiary education institutions, overseas donors, private islands etc. will need to be fostered and strengthened. It will be equally important to have more local involvement while building links with the local private sector.

In the future

In the future we need to ensure that there is continuing finance for plant conservation, particularly in the light of climate change. It will be important to establish innovative finance mechanisms such as the proportional use of eco-tourism income, and resources and services provided by the forests.



We need to ensure that plant conservation issues are included in government plans.

OBJECTIVE 5:
Capacity Building for
the Conservation
of Plant Diversity



TARGET 13:

Increasing funds for plant conservation

Sub-target 13a: Assessing financial needs for the strategy

Complete a study on the financial needs for the achievement of the National Plant Conservation Strategy by 2005.

Sub-target 13b: Fostering partnerships and making links with other projects

Provisions made to address the implementation of the National Plant Conservation Strategy and required capacity building issues in plant conservation by 2007.

At least double the existing or available funds for plant conservation from foreign sources, government and private sectors.

Scope of this target

All of this work in plant conservation needs money as well as people! Where will it come from? This strategy will help Government to know what needs to be done in the field of plant conservation and therefore where to put its resources and where alternative financing will be needed. An assessment of the financial needs of the strategy is therefore essential. Few of the other targets will be achieved without finance!

Current situation

Most areas with high floral diversity are in government hands and there has been good government support for environmental projects in the past. However, current financial difficulties have resulted in competition between sectors, making it less easy to support, for example, necessary maintenance of protected areas. Funding from international donors for large scale programmes has become inconsistent and there has been an increasing reliance on a small number of NGOs to carry out environmental projects. However, several recent programmes have relied on partnerships between a number of international and local players, including government and NGOs.

Up until now, the focus has been on conservation of 'flagship' species (mostly birds) or on integrated environmental management. Within the EMPS and NBSAP there have been only a few projects relating specifically to plant conservation (e.g. forest conservation, alien invasive species, coco-de-mer management).



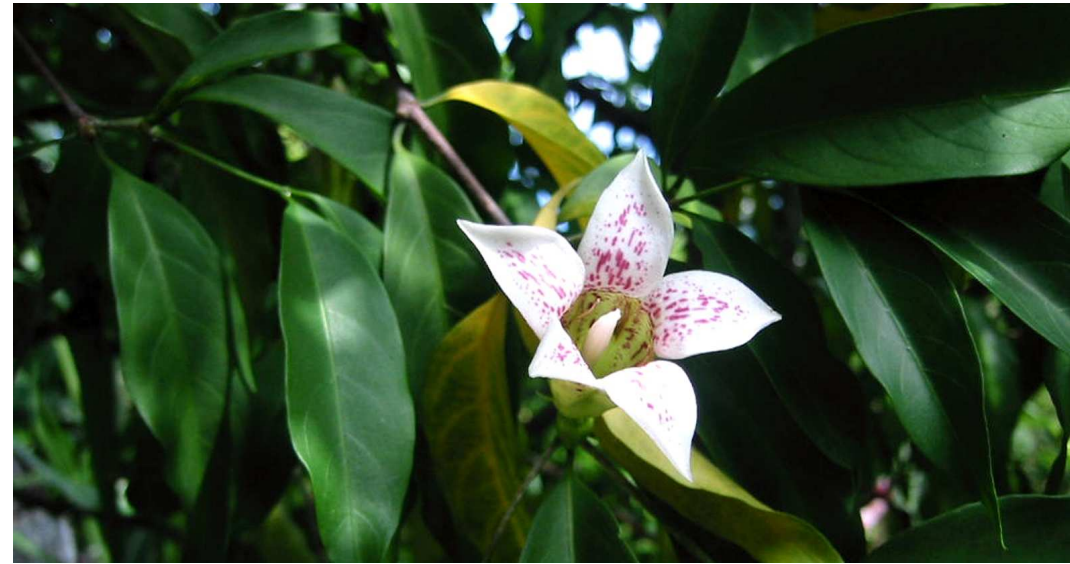
eden project



The logos of some of Seychelles' local and overseas partners for plant conservation.



Darwin Initiative



'Bwa sitron' (*Rothmannia annae*) grow naturally only on Aride Island but where else have people planted it? This kind of information is needed for the database.

Between now and 2010

Priorities for action are shown in the sub-targets. Checklists and data can be updated for flowering plants fairly quickly (sub-target 1a) but ferns will require more time (sub-target 1b). Knowledge and information needs to be made more accessible, as is shown in sub-targets 1c and 1e. Networking (see Target 14) will also be useful in making information more available. An atlas of important plant areas (sub-target 1d) (similar to the atlas of important bird areas) will aid both conservationists and land developers to make decisions relevant to native plant protection.

In the future

Our knowledge of the Seychelles flora is still very incomplete, particularly for mosses, liverworts, lichens, fungi and algae. In future, checklists should be completed for these plant groups too. Some of them may well prove to be important 'bio-indicators', telling us much about impacts on the environment due to climate change and/or pollution. We also need more information on the flora of the outer islands. Storage facilities at both the National Archive and Herbarium could be improved - a digital herbarium and photographic checklist could also be a solution.



What would you use to identify this endemic plant?

Current Information on Seychelles plants and fungi

Group	Granitic islands	Outer islands
Flowering plants (Dicotyledons and Monocotyledons)	More or less complete for Dicotyledons; Partially developed for Monocotyledons	Needs revision
Ferns	Partially developed	Partially developed
Bryophytes (mosses and liverworts)	Partially developed	Little known
Algae (both freshwater and marine)	Partially developed	Partially developed
Lichens	Little known	Little known
Fungi	Little known	Almost nothing known

OBJECTIVE I:
Understanding and
Documenting Plant
Diversity



TARGET 2:

Evaluating the status of native plant species

**Sub-target 2a: Quantitative
assessment of native plants**

Establish a quantitative assessment of native flowering plants and ferns to be used as a baseline for monitoring.

**Sub-target 2b: Red Data List
published**

Publication of a Red Data List of flowering plants by 2006.

**Sub-target 2c: Assessing threats
from alien invasive species**

Establish agreed methodologies to quantify the threats from and status of alien invasive species that threaten native ecosystems.

**Sub-target 2d: Monitoring
ecosystem changes**

Establish methodologies for monitoring ecosystem changes, including the identification of plant bio-indicators.

**Sub-target 2e: Contingency
plans established**

Set up contingency plans to respond to urgent new priorities and changing circumstances in plant conservation.



Invasive creepers! A better assessment of this threat to native species is needed.

**Establish and implement a monitoring and evaluation
framework for native species.**

Scope of this target

The conservation status of native plants should be based on scientific information i.e. evaluation using measurement rather than general observation or word of mouth. This enhances decision-making about which plants require priority conservation action. Red Data Lists summarise this information and are based on internationally agreed criteria. Many of our native plant species are threatened by the spread of introduced 'alien' plants which have become invasive. It is important to quantify this threat in order to determine priorities for action and to find effective ways to combat the threat (Target 7). When changes to ecosystems over time can be measured through appropriate monitoring, we are in a better position to see if threats are increasing and/or whether conservation/control actions are effective. The use of indicator species which are particularly sensitive to environmental changes makes this work simpler. When significant changes occur or if new problems arise, it is necessary to act quickly (as when *Clidemia* was noticed on Mahé, for example). In such cases it is important to have established contingency plans so that everyone can act together to ensure conservation of our native flora.

Current situation

The work of Annette Carlström in the mid 1990s, based on extensive field observations, gave a useful assessment of the status of native flowering plants. However, ten years on, her work needs updating and quantifying using IUCN criteria for a Red Data List. This process has been started by students from ETH, Zurich and PCA. General assessments for several of the inner granitic islands were done by Mike Hill and others, the results being published in 2002. General assessments of many of the Seychelles islands are currently being carried out by NPTS. In terms of monitoring, Vallée de Mai contains some permanent monitoring plots (originally set up in 1985) and a number of plots have been monitored for invasive plants by staff and students of ETH, Zurich.



"Is there a better way to do this?" sharing local experience.

Between now and 2010

A priority is to improve the utilisation of the capacity that we already have (e.g. in field research) so that graduates work in the field, instead of (or as well as) in administration. Another priority is to further develop strategic partnerships with research and tertiary training institutions, particularly those having expertise in tropical environments, so that Seychellois can do relevant taxonomic and plant conservation courses at B.Sc and M.Sc levels, or alternatively do short (6 month) courses in specialist fields like bio-security, field research methods and data analysis (Sub-target 12a and 12d). People who have a good knowledge of plants but few official qualifications can be trained locally as para-botanists* in certain specialised fields (Sub-target 12b). The same is true for plant conservationists**. Training trainers in plant conservation practices and issues (Sub-target 12e) will be a pre-requisite. There is also potential for knowledge and expertise transfer between expatriate researchers and local plant conservation workers. An important area of concern is to attract young people into plant conservation work. In all cases a better career structure (Sub-target 12c) would encourage people to remain in plant conservation related work.

In the future

Further expertise will be needed in the future for work on the so-called lower plants, such as mosses and lichens. Indigenous/traditional knowledge of Seychelles' flora should be recorded before the older generation disappears. As plant conservation evolves, so will the requirements for capacity development, therefore long-term planning should emphasise worker flexibility and a willingness to share knowledge and expertise.

- * Para-botanists can be defined as experienced botanical staff who may not be qualified to academic levels.
- ** Plant conservationists can be defined as experienced and knowledgeable individuals who have a deep interest in and understanding of plant conservation principles and are actively involved in monitoring and/or habitat restoration programmes.



Local and overseas experts exchange information a key to increasing research capacity.

OBJECTIVE 5:
Capacity Building for
the Conservation
of Plant Diversity



TARGET 12:

Improving local capacity

Sub-target 12a: Training botanists

Train at least 4 botanists.

Sub-target 12b: Other local training

Train 5 para-botanists* and 2 plant conservationists** annually.

Sub-target 12c: Employing local botanists and other trainees

Employ at least 2 botanists, 10 para-botanists* and 15 plant conservationists** and provide sufficient incentives to keep them in post locally.

Sub-target 12d: Trained people in biosecurity

A minimum of one trained entomologist and one trained plant pathologist readily available.

Sub-target 12e: Training trainers!

Improve local capacity to deliver educational programmes and establish relevant indicators of success.



Special training for experienced field personnel is a way to increase capacity.

Improve capacity amongst government, the NGOs and private sector, to implement the National Plant Conservation Strategy and achieve its targets.

Scope of this target

In Seychelles there are few scientific botany specialists and no taxonomists. Because of lack of local capacity, much plant research is carried out by foreign experts. Another problem has been 'brain drain', both within the country (migrating into administrative jobs) and from the country. The large area of protected land also requires a qualified workforce to look after it. Therefore, in order to achieve the targets in this plant conservation strategy it will be vital to increase the capacity of people already employed in plant conservation and related fields, increase the number of trained botanical workers and provide a better career structure for plant conservation personnel. Achieving this target will have a positive effect on all other targets.

Current situation

There are no local botany graduates! Currently there are local graduates in a number of related fields, working in the Department of Environment (some 30 persons in all) and employed by conservation NGOs (about 8 persons), but no specialist botanists. In fact more people have trained as horticulturalists and foresters than as botanists. Both NGOs and private islands that have conservation policies employ expatriates for special projects. However, there are many local para-botanists*, who have developed their knowledge through their own field experience and research. At the moment though, there is perhaps too much reliance on committed individuals and there is also high staff turnover. A particular weakness is felt to be field research expertise. It is difficult for Seychellois graduates to continue their education up to Masters and PhD level in order to acquire such expertise. Some links have already been made with overseas institutions e.g. ETH, Zurich and Eden Project, UK, in which there is collaboration on research and field projects. As there is no university in Seychelles, the main local training potential is at the Polytechnic and NIE.



A valuable mountain habitat but which species are threatened and by what?

Between now and 2010

The priority actions are production of baseline figures for native flowering plants and ferns, and publication of the Red Data List (Sub-targets 2a and 2b). However, alien invasive plants present the real challenge. Establishing a database of alien species, as part of Sub-target 2c, will help with risk assessment and facilitate the processes outlined in Sub-targets 6d (phytosanitary legislation) and 7b (early detection and rapid action against new alien species). Sub-target 2d emphasises the importance of monitoring the changes that are already taking place in the various natural habitats of the islands and will facilitate the prioritising of mitigating actions. Contingency plans (Sub-target 2e) enable consistent and rapid reaction to such changing circumstances and can be enhanced by regional cooperation and networking (see Target 14).

In the future

A Red Data list for species other than flowering plants and ferns is perhaps far in the future because little taxonomic work has been done on groups such as lichens and fungi. It is possible we are losing species before we even know they are there. This represents both a stimulus and an opportunity for further research. The significant challenge of responding to alien invasive species will continue. Another challenge will be the probable impacts of climate change on the native flora.



Monitoring is vital for assessing ecosystem changes.

OBJECTIVE I:
Understanding and
Documenting Plant
Diversity



TARGET 3:

Enhancing plant research in Seychelles

**Sub-target 3a: National
research agenda for plants**

Develop a national plant research agenda through a consultative process and set priorities.

**Sub-target 3b: Research on
threatened species**

Complete research on the ecology and conservation biology of 10% of the threatened species by 2010.

**Sub-target 3c: Protocols for
habitat restoration**

Develop protocols for best practices in habitat restoration.

Develop and implement a national plant research agenda.

Scope of this target

Research is necessary if we are to understand how native plants interact with their environment. Although there are many observations on native plants, there has been relatively little scientific research on their ecology and conservation. Even the famous coco-de-mer is under-researched, partly perhaps because of the length of time required for any phase of its life cycle (e.g. 6-7 years for a fruit to mature, 15-40 years for a young palm to mature). This target thus aims to ensure that there is a co-ordinated national research programme which meets the needs of plant conservation. Development and testing of various techniques for habitat rehabilitation requires a good research base in order to determine the most appropriate and efficient methods. However, research often suffers from lack of local capacity in scientific field methodology and data analysis, so there are links with Target 12 (improving capacity).

Current situation

A few of the many gaps in our knowledge are under investigation. For example, research on several rare endemic plant species is being carried out at Eden project, UK and various Botanical Gardens overseas (e.g. Brest, France and Missouri, USA). Other plants such as coco-de-mer and the pitcher plant have received some attention locally by individual researchers. Such studies ensure conservation (Target 4) is based on good science. ETH, Zurich has sent a number of research students to look at various aspects of the ecology of native plants and competition between native and alien plants in Seychelles.

There are a number of trials on restoration of natural habitats being carried out by the Forestry Division, SIF, NGOs, private islands and individual citizens, which include the planting of native species and/or clearing of aliens around naturally regenerating natives.



Field research is an essential conservation tool.



"Learning by doing" helping to control invasive plants.

Between now and 2010

The Ministry of Education will need to play a significant role in order to achieve this Target. Some of the awareness targets in this National Strategy should help to address the shortage of reference materials on plants and plant conservation for teachers and students. In addition, it will be necessary to include more information on botanical issues for trainee teachers in NIE courses. Because of a certain lack of human resources the Ministry of Education could make use of people who are knowledgeable about plants as resource people for teaching at this level. It will be necessary to explore methods of enhancing the botanical knowledge of trained teachers (see Target 12) especially in the field.

Students in the secondary and post-secondary system who are studying for international exams follow curricula that are determined outside of Seychelles. However, it is thought that project work or extracurricular activities could encourage better understanding of plants and plant conservation.

A Science Fair is held for schools every two years. This fosters a creative approach to studying plants and plant products of all kinds through collaborative project work.

In the future

New approaches to education will be encouraged as part of the United Nations Decade of Education for Sustainable Development (2005-2014). Sustainable development is essentially about relationships between people and the environment, including respect for the greater community of life in all its diversity. As plants are an essential part of this environment, an education system that fosters values, responsibility, creative decision making and problem solving builds capacity for plant conservation too.



A groups of teachers discuss their newly acquired knowledge in the Botanical Gardens.

OBJECTIVE 4:
Promoting Education
and Awareness about
Plant Diversity



**Sub-target 11a: Plant knowledge
in primary schools**

Local plant identification covered in primary school curriculum.

**Sub-target 11b: Plant ecology in
formal education**

Native plant ecology incorporated in secondary and post-secondary curricula.



Field explorations are important for Wildlife Club members.



A selection of local NGO newsletters.

TARGET 11:

Increasing awareness in the education system

Ensure that plant conservation and biodiversity issues are incorporated within the formal education curricula and informal education, including extra-curricular activities.

Scope of this target

Education is given pride of place in Seychelles in terms of funding and emphasis in government policy. To incorporate plant conservation into the official curriculum is a great challenge but if achieved will be a major step forward for the National Strategy on Plant Conservation. Making resources available will be imperative in this process (Targets 1 and 10), as will Target 12 relating to training the trainers (i.e. teachers).

Current situation

Environmental education has formed part of the formal education system for some years, but many ecological topics are covered only superficially. And of course plants are studied in the science and biology curricula. However, there is almost no focus on **native** plants and they are not often used as examples in plant studies. In the secondary educational system there is still much to do to encourage teachers to take their students out into the field. One of the constraints is that teachers are unfamiliar with many native plants and often do not know which plants are native and which are introduced. Although there is now a Native Plants module for P6 to S3 levels, it is not currently being used in the curriculum situation. Informally, many schools have a Wildlife Club as one of their extra-curricular activities. Such clubs promote outside activities and there are an increasing number of exciting resources produced by NGOs and nature reserves available to teachers and club leaders. The Natural History Museum also runs a club for school-age students.



Learning about native plants can be included in the school curriculum.



Vegetation rehabilitation using native palms. We need to assess the effectiveness of different methods.

Between now and 2010

Threatened species should be prioritised for research on their ecology and conservation biology (Sub-target 3b). This will depend on our capacity as a country and also on co-operation between local players (Sub-target 3a). There is a need to use present capacity efficiently and to allow more graduates to go into research rather than administration. Collaborations with overseas organisations and establishments should be maintained or widened. Current habitat restoration projects tend to be 'hit and miss'. We need to determine the best practices for restoration here in Seychelles (Sub-target 3c), referring to examples from elsewhere. We also need to monitor and better document such restoration projects. There might be potential for A-level students who are waiting to go to university to do practical work, in both research and habitat restoration, which would provide useful experience for their further studies. University students could also do their research thesis for B.Sc and M.Sc in the field in Seychelles.

In the future

There are so many gaps in our knowledge of plant diversity and habitat requirements that there will be no shortage of potential research projects. We need to build up our capacity to take leadership in directing research.



'Bwa mediz' (*Medusagynne oppositifolia*). What is the best way to conserve this threatened endemic plant?

OBJECTIVE 2:
Conserving Plant
Diversity



TARGET 4:

Conserving threatened plants

Sub-target 4a: Ex situ conservation

Conservation of 95% of threatened flowering plant taxa ex situ.

Sub-target 4b: In situ conservation

Ensure viable representation of 95% of threatened flowering plant taxa within protected areas.

Sub-target 4c: Species recovery programmes

30% of critically endangered flowering plant taxa included in species recovery programmes.

Conservation of threatened flowering plant taxa in situ and ex situ.

Scope of this target

Although Seychelles has a good record of conservation in general and about 45% of its total land area is protected as National Parks and Reserves, the survival of many native plant species is threatened by a variety of factors. Target 4 aims to conserve as many threatened native flowering plant taxa as possible, in situ within protected areas, and ex situ by propagating them in botanical gardens for example. For long-term conservation it is essential to have populations of plants that can maintain themselves (i.e. be viable). Priority is given initially to critically endangered species. The work of Target 4 is closely dependent on other target areas, such as 2b (Red Data List), 3b (research), 6b (new protected areas) and 7a (management of invasive species).

Current situation

According to Carlström (1996) 53% of endemic flowering plant species in the granitic islands are threatened (i.e. critically endangered, endangered or vulnerable). Only two or three species are known for sure to be extinct. One major achievement is the current development of a Biodiversity Centre at Barbarons. This, together with an NBSAP project funded by the Darwin Initiative has enabled the Botanical Gardens to carry out baseline studies in propagation techniques for native plants, e.g. testing the most appropriate method for a particular species. So far, about 50% of endemic flowering plants have been successfully propagated ex situ. Several private islands are also doing ex situ work.

Currently, lowland endemic species are poorly protected, as are species restricted to Silhouette, so Sub-target 4b depends also on actions in Target 6. Only one comprehensive species recovery programme (Sub-target 4c) has so far been started in Seychelles (*Impatiens gordonii*).

Between now and 2010

Action on this target depends very much on work done in Targets 2 and 3 because further information is required in order to prioritise species for protection and recovery. One appropriate action will be to establish research collaborations, for example with other Botanical Gardens (e.g. BGCI, Edinburgh, Eden Project) perhaps focussing on how to raise plants ex situ (Sub-target 4a) to a state which will ensure reproductive maturity when being reintroduced into the wild (Sub-target 4b and 4c).



Children want to learn but they need more information about Seychelles plants.



The Biodiversity Centre at Barbarons is increasingly important for ex-situ conservation of endemic species.

Between now and 2010

The two sub-targets highlight gaps that can be filled fairly easily. All agencies and individuals should ensure that research is made available to the general public in simpler formats, whether to the media or in printed form or as displays or in public meetings. For example visiting scientists should be encouraged to present their results. This will help people to understand situations that are currently under review or being researched (such as the sandragon disease, the spiralling whitefly problem and work on invasive species) and will also bring to the attention of the public new problems that arise. The education and information sections within MENR should be significant players in this process. In addition, project officers in various government agencies should build in awareness aspects to the projects in their domain.

Children are a particular focus in this Target. If they can become knowledgeable and excited about plants, they will hopefully become enthusiastic actors in plant conservation work in the future.

In the future

There will always be a need to find new ways to present information on plants and plant conservation issues in lively formats that enable people to understand, to creatively resolve problems and to become involved in acting on behalf of plant conservation. Website information and networking will become more important in the future (Targets 9 and 14).



All of us can learn new facts about local plants, even decision-makers!

OBJECTIVE 4:
Promoting Education
and Awareness about
Plant Diversity



TARGET 10:

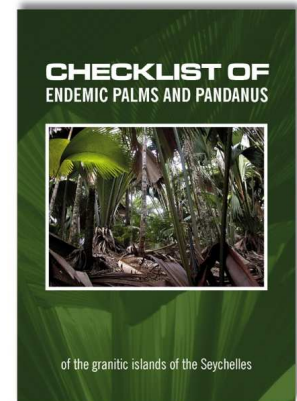
Making information more widely available

Sub-target 10a: Research results made available

Ensure timely dissemination of research results of local plant conservation initiatives to the public in appropriate formats.

Sub-target 10b: Children's book about plants

Produce a book for children to stimulate interest in local plants.



Publications about plants should be widely available.

Publications and resources about local plants made widely available to support public awareness on plants and their conservation.

Scope of this target

Target 10 relates closely to Target 1, Target 9 and also to Targets 11 and 14. While Target 1 aims to establish information resources as a way of furthering our knowledge of plant diversity, and Target 9 focuses on the media and public education, this target supports the dissemination of printed and visual material in simple and/or appropriate formats for particular audiences. The more people know about plants, the more they will appreciate the role that plants play in our lives, and the greater may be their willingness to support this National Strategy.

Current situation

In general there are not enough resources readily available for people to consult, especially teachers (which is why this target is important for Target 11). Useful books are often out of print and can only be accessed at the National Library or National Archives. Other useful resources are available only in schools and not to the general public. Some of the plant research and conservation initiatives that have been carried out, including by visiting scientists, are kept in government offices. Most of them are in technical language which is difficult for non-specialists to understand. Although some public lectures and workshops are held on plant conservation research or forestry issues, they tend to be poorly attended. NGO newsletters such as Phelsuma and Zwazo occasionally feature plant articles. The latest initiative to fill this gap is the printed and electronic newsletter 'Kapisen', produced by the Plant Conservation Action group. A few practical brochures and posters have been produced by MENR on issues such as alien invasive species.



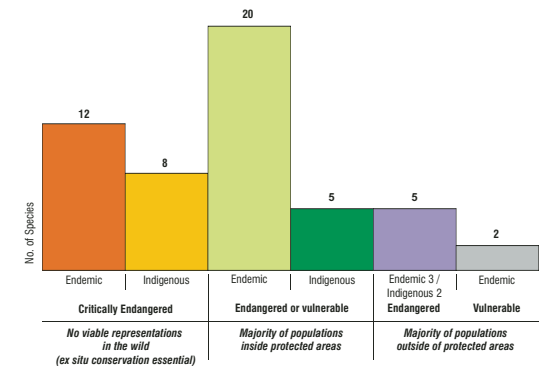
Part of the Morne Seychellois National Park. Protection of such areas helps protect the rare species within them.

Most of Seychelles' Reserves have management plans, so it will be possible to update these to include new plant conservation targets. But continuing pressure on land for development increases the threat of habitat fragmentation. Consequently work carried out under Targets 6 and 7 will be important, and it will also be necessary to increase public awareness of the need to protect endemic species (Target 9). With 12 endemic flowering plant species critically endangered (Carlström), the 30% mentioned in Sub-target 4c means an additional 3 to 4 recovery programmes will need to be started.

In the future

This target currently relates to granitic island species and to flowering plants only, so there will be a need to expand to the outer raised coral islands (whose remoteness adds to the difficulties and costs) and to the smaller plants such as ferns and mosses. Our knowledge about the future impacts of climate change on endemic species is limited.

Endangered Seychelles Flowering Plant Species Populations in the Wild
(criteria based on Carlström 1996)



OBJECTIVE 2:
Conserving Plant
Diversity



TARGET 5:

Conserving crop diversity

Sub-target 5a: National database for crop varieties

Update a national database on local crop varieties in situ and ex situ.

Sub-target 5b: Conserving rare crop varieties

Conservation of 60% of local crop varieties in ex situ collections.

Sub-target 5b: Local participation in rare crop conservation

Strengthen on-farm conservation by involving 500 home gardens in planting rare crop varieties.

Conservation of crop diversity in situ and ex situ.

Scope of this target

Since the colonisation of Seychelles, many crop varieties have been introduced. They form part of the plant biodiversity of the islands, as well as part of the culture and history of the country. Crops include fruits, vegetables, root crops, spices, essential oils and cash crops. Conservation of rare crop varieties is relevant both on a national and an international level as crop diversity is diminishing as fast as wild plant diversity. Conservation of crop diversity can be done either ex situ, in centralised field 'gene banks' or laboratory 'gene banks' (e.g. as seeds), or in situ on farms and in home gardens. Local knowledge about crop management also forms part of the conservation of traditional crops.

Current situation

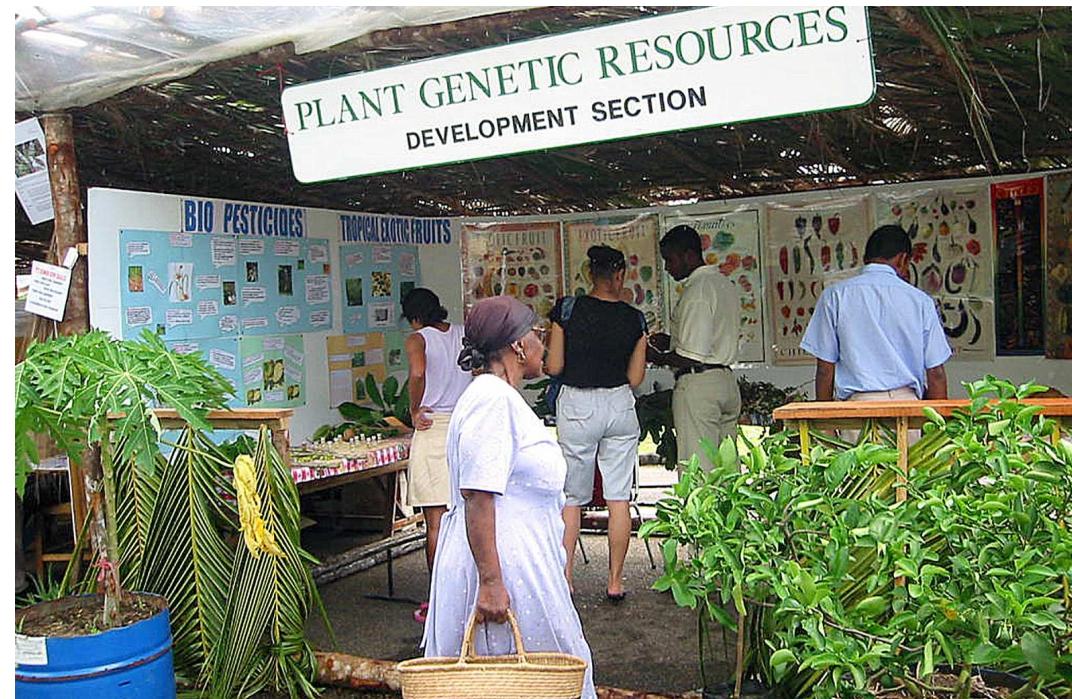
Through an NBSAP project funded by FAO, an inventory of local crop varieties on-farm has been initiated. A protocol for on-farm site visits exists and a database has been set up by Plant Genetic Resources (PGR) section of MENR in collaboration with the Botanical Gardens. From the statistics of crops sold over the years, it can be assumed that a diverse gene bank of crops exists in Seychelles in situ on farms and in home gardens. During the 20th century the PGR had established an extensive ex situ field gene bank of crop varieties from around the world, e.g. over 100 varieties of avocado or mango trees. Much of this gene bank has already disappeared or is threatened by housing development.



'Margoz' (bitter gourd) local people can grow local popular varieties of crops.



In Seychelles it is important for our nutrition that we cultivate a wide selection of fruits and vegetables.



The annual Agricultural and Horticultural Show is visited by many Seychellois and represents a wonderful opportunity for increasing public awareness about plant conservation issues.

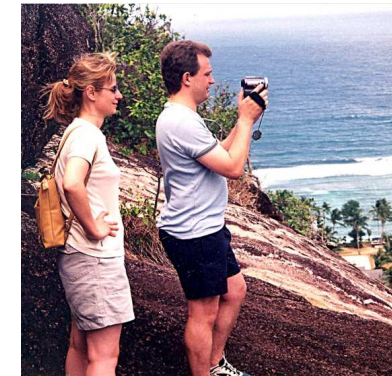
Between now and 2010

In a small country like Seychelles, most people read local newspapers and watch TV programmes, so this is one of the main foci for broadening awareness of plant conservation issues. A more interactive approach within the media would encourage debate. By holding workshops tailored to different target groups, it will be possible to give opportunities for greater dialogue and understanding than is possible through the media. Providing training, e.g. in conservation techniques, will also increase the number of knowledgeable people who can act as volunteers or promote good practices in plant conservation. Many organisations can be involved in outreach programmes of this kind.

A wider international audience can be reached through a website, to feature both native plants of Seychelles (research initiatives, conservation programmes, etc.) and to promote this Strategy. Encouraging tourists to engage with plants is seen as a way to promote plant awareness internationally (as part of the global strategy) and also to involve local people more directly through the innovative development or improvement of facilities and activities in tourist establishments.

In the future

It is hoped that with greater awareness, there will be increased and broader support, both locally and internationally, for measures to further plant conservation and sustainable environmental practices within Seychelles. This will encourage greater financial support and active participation in plant conservation.



A few hotels have nature trails. Further tourism initiatives to increase visitor awareness can be encouraged.

OBJECTIVE 4:
Promoting Education
and Awareness about
Plant Diversity



TARGET 9:

Increasing public awareness

Sub-target 9a: Using the national media

Regular programmes and articles produced in the national media to highlight the importance of native plants in local ecosystems.

Sub-target 9b: Using the internet

Website developed to feature Seychelles native plants and promote the NSPC, by 2007.

Sub-target 9c: Using presentations and workshops

Presentations and/or training workshops about plant ecology and plant conservation to be held regularly, including information on native plants, plant genetic resources, invasive species and control measures.

Sub-target 9d: Tourism

Engage three tourist establishments in the development of innovative educational tools for tourists, using plants as a basis for awareness building.



A local TV environment programme that includes information on plants and their conservation.

Raise public awareness of plants and ecosystem conservation issues through the national media and other means.

Scope of this target

Seychellois are generally aware that the environment is important in our lives, but plants in particular tend to be taken for granted. Our daily existence depends on the diversity of plants, not just for food but also for many of our other requirements. In a world of decreasing resources, sustainable production and use of plants becomes imperative, as does the conservation of plant biodiversity. This target therefore aims to increase public awareness of the importance of native plants in Seychelles' ecosystems (Target 1), the need for sustainable practices (Target 8), as well as to provide ideas for plant conservation actions (noted in several other Targets). There is also a need for greater awareness of specific conservation issues and methodologies in areas such as plant propagation, habitat restoration and invasive plant species. A further need is to promote this NSPC strategy so that people understand what needs to be done for plant conservation. Seychelles can also contribute to international plant conservation by educating the many tourists who visit. Target 9 is relevant for all other targets and will be essential for promoting the positive results of actions carried out under the different targets.

Current situation

The environment currently gets good media coverage through locally produced and imported radio and TV programmes, and also in local newspapers. Several international environment days are celebrated with special activities, e.g. National Parks Day, Wetlands Day. Other avenues exist for the promotion of plants, for example the Natural History Museum and the EIC units within MENR. Training workshops for teachers and wildlife club leaders have been held at the Botanical Gardens in conjunction with Kew Gardens and Eden Project. The annual Agricultural Show brings together agriculture, horticulture, crafts, culture and practices. For tourists to better appreciate our plant heritage, biodiversity and environmental policies, there are attractions such as the Botanical Gardens, Vallée de Mai, Cousin Island, Aride Island, Moyenne Island, Spice Garden, Natural History Museum, Curieuse Visitor Centre and a network of Nature Trails in National Parks as well as at tourist establishments. Tourist guides can play an important role in the promotion of Seychelles' conservation strategies.



An old mango tree can be the source of genetic variation that proves useful in the future.

Between now and 2010

The inventory of crop varieties (Sub-target 5a) is the ongoing priority and it is intended to extend it to home gardens. Based on the inventory and database, a 'Red List' of rare crops will be compiled and a national action plan defined. It is planned that a selected number of crops will be conserved ex situ on an 11 ha field gene bank forming part of the Barbarons Biodiversity Centre (Sub-target 5b). It is proposed to encourage public participation in the planting of rare crop varieties in situ on farms and in home gardens (Sub-target 5c).

In the future

It is important for national food security, cultural diversity and sustainable agriculture that a wide variety of crops with different adaptations is available for people to grow. For example, crops adapted to different soil conditions or drought, resistant to different pests and diseases and providing crops with different tastes and with different fruiting seasons. As we do not know how climate change will affect our crops, this target may become increasingly important. It is also important that traditional knowledge of farming systems and methods is recorded before it is lost.

Note: Instead of 'crop diversity', the term 'Plant Genetic Resources for Food and Agriculture' (PGRFA) is often now used.



'Mayak' (Cassava) is an important crop for national food security.

OBJECTIVE 2: Conserving Plant Diversity



TARGET 6:

Linking legislation with plant conservation

Sub-target 6a: Legislation and conservation issues

Enact a legislation framework to regroup biodiversity issues by 2007, to address the various conservation issues such as poaching, unsustainable harvest, research, development pressure.

Sub-target 6b: New protected areas

Declare specific areas of protection and regulate them by 2008: Mt Sébert, Planneau, Bernica, La Reserve / Brulée and Mt Cauvin.

Sub-target 6c: Access and benefit sharing

Develop a policy and enact legislation for access and benefit sharing by 2007.

Sub-target 6d: Phytosanitary legislation

National phytosanitary legislation to be reviewed and harmonised with international and regional provisions by 2006.



Phytosanitary inspection of imported fruits and vegetables reduces the risk of new introductions of pests and diseases.

Review, harmonise and effectively implement national legislation on the conservation of biodiversity.

Scope of this target

Although Seychelles has some good environmental legislation, it is fragmented and inadequate in certain specific areas relating to plant conservation, e.g. bioprospecting, phytosanitary legislation, conservation of the majority of endemic plant species. This Target aims to ensure that new legislation (in the form of an umbrella framework for all biodiversity related legislation - the Biodiversity Act) is comprehensive with respect to the conservation of Seychelles' flora. This includes the need to define who has access to plant resources and who benefits from their use. Another area of concern is the enactment of regulations pertaining to the protection of National Parks. Education and awareness (Target 8) become essential for public cooperation, as people need to understand the necessity for the legislation if they are to comply.

Current situation

Biodiversity legislation was being reviewed in 2001 but the process stalled for a number of reasons. Currently a legal committee is reviewing all pertinent legislation and trying to harmonise it with respect to penalties, sentencing, etc. It is also finalising legislation relating to, for example, plant genetic resources. Legislation protecting certain plant species (Breadfruit & Other Trees Act) was amended in 1994, as was the Coco de mer Decree (1994).

A good number of islands and land areas are protected by law, e.g. Aride island, Morne Seychellois National Park, Vallée de Mai, but certain pockets of rich plant biodiversity remain outside this protection.

A permit system exists for the utilisation of some natural products such as coco de mer nuts, and harvest/felling of certain timber trees. However, if private land-owners are protecting their resources, they may wish to gain more benefit from them.

Several new invasive plant species, and plant pests and diseases have recently been introduced into the country. Capacity to enforce even current regulations controlling illegal entry of such species is low but is in the process of being strengthened.



'Latannien fey' has traditionally been used for thatching. Harvest is currently probably sustainable, but what about the harvest of coco de mer?

Between now and 2010

In order to encourage sustainable production and management of valuable native plants (Sub-target 8a), economic incentives may be required. Herbalists and perfumiers need encouragement and creative incentives to cultivate the native species they use. Alternatively, native medicinal plants could be grown and traded on a commercial basis, e.g. by private planters, the Biodiversity Centre, National Heritage, or within a community project. Policies will be needed and perhaps 'codes of conduct' in order to avoid over-exploitation and to encourage benefit sharing. The introduction of an international label for sustainably produced mahogany could be considered. Sensitisation is also a vital part of changing behaviour (e.g. the misuse of certain species because of their supposed "magic power"). Sub-target 8b tackles such issues.

Sensitisation is also necessary if our unique coco-de-mer populations are to remain viable in the distant future, particularly in terms of the replanting of nuts. Coco-de-mer should be considered as a CITES listed plant, which would also foster better international control of illegal trade in the nuts and nut products. Sub-target 8c is nationally important.

In the future

Actions include registration and certification of (qualified) herbalists, and certification of forest products. If a system of organic licensing for farmers were to be introduced (i.e. sustainable production of food), then it might be easier to push for sustainable production and use of other products. Other possibilities include initiatives by schools to plant and care for socially important plants in order to raise their profile.



All plants used in craft work should be sustainably harvested.

OBJECTIVE 3:
Using Plant
Diversity
Sustainably



TARGET 8:

Sustainable production of valuable plants

**Sub-target 8a: Sustainable
production**

Produce 80% of plant-based, locally
derived products sustainably by 2010.

**Sub-target 8b: Sensitising and
helping users**

Sensitise and provide incentives such
as technical support to the herbalists
and stakeholders, so that poaching and
over-exploitation are no longer
threats to native plant species.

Sub-target 8c: Coco-de-Mer use

Establish and implement effective
mechanisms for the sustainable use of
Coco-de-Mer, including consideration
of its inclusion in CITES appendices.

**All native plants of socio-economic value should be available
only from sustainable production**

Scope of this target

It is not only the coco-de-mer which has value in Seychelles. Some of our other native plants have socio-economic value too, for example the timber of bodanmyen and gayak; latannyen fey leaves for thatching, bwa zoliker and bwa dou as medicine, var for rope, takamaka for perfume. In fact many native plants had historically important uses ("traditional use"). Target 8 aims to ensure the sustainable management, or "wise use", of all native plants of socio-economic value, so that there is no longer the threat of extinction by over-use and poaching. This target also aims to ensure that products are traded fairly and benefits are shared equitably. Although the emphasis is on native plants, sustainable practices should be introduced for all plant products produced in Seychelles, as Sub-target 8a implies.

Current situation

Many of the native medicinal plants are threatened by over-collection from wild populations and their use is currently unsustainable. Very few herbalists cultivate more than a few species of herbs, and usually not the native ones. A few attempts at planting medicinal herbs and selling them in the market have not been successful. Plant products such as latannyen fey leaves and coco-de-mer young leaves (used for weaving) are strictly controlled on state land. The sale of coco-de-mer nuts is regulated by law and controlled through a system of licences and permits. However, poaching is still a problem, particularly of coco-de-mer nuts because of their high value on the tourist market (as much as a month's salary for an ordinary worker). This target therefore is closely linked with Target 6 (legislation). Currently the use of coco-de-mer nuts is certainly unsustainable because very few nuts are planted to replace trees that will grow old and die. Although the felling of native trees is controlled, there is no labelling system for sustainably produced timber in Seychelles. A labelling system for crafts made from local materials has been proposed.



'Bwa zoliker' (*Pittosporum senecia* subsp. *wrightii*)
can be cultivated by herbalists.
This could be encouraged.



Mont Sébert, a refuge for many glacia species,
is one of the proposed new protected areas.

Between now and 2010

Harmonisation of biodiversity legislation is essential (Sub-target 6a). This should be followed by an educational and awareness programme so that people understand the implications of the new laws and regulations.

An NBSAP project to protect selected areas with unusually high biodiversity value must be activated (Sub-target 6b). coco de mer legislation needs amending to include the exploitation of coco de mer kernel and the concept of revenue sharing, and perhaps also a legal requirement to replant coco de mer nuts. Access to other plant resources such as orchids, flower scents and plants with medicinal properties, requires planning and regulation so that the benefits are shared, which will encourage land owners to protect and conserve plant resources for future generations. Phytosanitary legislation (Sub-target 6d) requires updating to bring it in line with international standards, followed by public awareness building.

In the future

It is important to strengthen the legal framework but it will then be critical to ensure that the implementing agencies have the capacity to enforce the laws, which are otherwise of little value.



Coco de mer nuts with official tags.
Two outstanding issues are benefit sharing
and non-sustainable harvest.

OBJECTIVE 2:
Conserving Plant
Diversity



TARGET 7:

Managing alien invasive species

Sub-target 7a: Management programmes

Implement efficient management programmes for at least 7 established invasive plant species.

Sub-target 7b: Detecting and acting against new invasive species

Develop and implement mechanisms for early detection and rapid action against potentially new invasive species, including a manual of procedures for border control by 2007.

Sub-target 7c: Can we make use of invasive plants?

Develop and implement mainstreaming models for two invasive species as a component of their control programmes.



'Fo watouk' (*Clidemia hirta*). Rapid reaction against new invasions is required.

Review and implement enhanced measures to reduce the risk of introduction of new alien invasive species, pests and diseases, and manage existing species that could threaten natural ecosystems.

Scope of this target

Invasive species are recognised as a threat to biodiversity worldwide. Most of the habitats in Seychelles are dominated by alien plant species that have been introduced as timber, crop or horticultural plants. Some of these species hinder regeneration of native species, alter ecosystem processes and threaten to invade the few native habitats that remain (see Annex 5). Target 7 seeks to manage and control these established invasive plant species in the context of habitat management and restoration. However, invasive tree species can also play a positive role - for example in ensuring a forest cover, with its many functions, or in providing materials for human use (timber, cinnamon oil). Therefore it is important to look at novel or improved utilisation of their products as part of habitat management. There are also invasive animals and diseases that impact native plants by, for example, eating seeds or attacking whole plants. Target 7 therefore also seeks to reduce the risk of new introductions of problematic species of plant, animal and disease that have already proved harmful in other countries. But accidents happen and any new introductions to Seychelles will require early detection and rapid action. Target 7 therefore links with other target areas such as 2c (assessing threats from alien invasive species), and 6d (phytosanitary legislation).

Current situation

A number of management/containment programmes for invasive species have been carried out, mostly on an experimental basis. For example, a COI project tried different methods of control for invasive species such as Chinese guava (*Psidium cattleianum*) in high altitude forest. There has been small scale ring-barking of certain invasive tree species by the Forestry Section of MENR, and SENPA has a project on the improved use of timber species including invasive species. Invasive creeper control has been carried out successfully by SIF in Vallée de Mai and there have been control programmes for plants such as papaya on small private coral islands. The Ministry of Environment has had ad hoc programmes for creeper and *Clidemia* control in a few places but the problems have proved too great for available capacity. Progress has been made with a new national invasive species committee and a recent initiative to establish a regional network through COI.



Community action can help with control of invasive species - here in a freshwater marsh.

Between now and 2010

Collaboration between the Forestry Section and ETH, Zurich has resulted in some excellent scientific data which can be used as a basis for future control programmes. The Invasive Species component of the new GEF project will be important in developing suitable methodologies.

For sub-target 7b, a regional alien species database should be developed of those species known to be present, naturalised, or already invasive and those known to be invasive elsewhere. This would also help with sub-target 6d (legislation). Regional cooperation (see also Target 14) will enable some problems to be tackled for mutual benefit.

Sub-target 7c calls for a more creative approach to invasive species control, including the possibility of making commercial use of these species or their products as a way of encouraging good management. Examples are cinnamon oil, paper made from plant material, wood products. This approach also provides business opportunities for small enterprises.

In the future

The effects of climate change are not well understood yet. The spread of *Merremia* creeper and the susceptibility of takamaka and sandragon to disease may have been influenced by such changes. Monitoring programmes and constant vigilance will be needed well into the future, as well as control and management of invasive species.



Converting an invasive species into a useful product: Albizia wood as a base for parquet flooring.