Kapisen

Plant Conservation Action group September 2004 Volume 1 Issue 2 **Newsletter**

Special Issue on Seychelles' National Strategy for Plant Conservation

Voices from around the world

A year on Aldabra in the 1970s taught me just how special and how fragile the unique biodiversity of the Seychelles is. The preservation of Aldabra is one of the world's greatest conservation success stories. When I visit Seychelles today I am impressed by the many ambitious conservation programmes aimed at restoring the endemic plants and their habitats and removing invasive introduced species.

Stephen Blackmore

(Royal Botanic Garden Edinburgh)

Seychelles' importance for science can hardly be exaggerated: Taking Aldabra or the Vallée de Mai there are opportunities like nowhere else to generate theories and models that play central roles in the development of mainstream evolutionary biology and pure and applied ecology. As a "natural laboratory" and a place of outstanding beauty at the same time the Seychelles deserve worldwide appreciation and all kinds of action to safeguard what could easily be lost.

Karl Fleischmann

(Geobotanical Institute, ETH Zurich)

La beauté des Seychelles n'est pas un mythe. J'ai été frappé par la richesse et l'originalité de sa flore, ses Coco-de-mer, ses Inselbergs..., uniques au monde. Je considère les Seychelles comme une grande sœur des Mascareignes. La stratégie de conservation me semble complète et pourrait servir de modèle pour les archipels voisins. J'espère qu'elle sera à la hauteur de ses ambitions et qu'elle apportera rapidement des moyens opérationnels avant qu'il ne soit trop tard.

Christophe Lavergne

(Conservatoire Botanique National de Mascarin, Ile de La Réunion)

Future generations will not forgive us if we fail in the National Strategy for Plant Conservation. Coming to the Seychelles has been very valuable for me, to appreciate the remarkable floral diversity and the complexity of its conservation. I am pleased therefore that the Strategy addresses both vital conservation biology issues and concerns for environmental and economic sustainability.

Peter Wyse Jackson (Botanic Gardens Conservation International) The issues facing conservationists in the Seychelles and in my native Mauritius are closely related. Therefore conservation initiatives adopted in Mauritius are inevitably of great interest to practitioners in the Seychelles and vice versa. The production of the Seychelles National Strategy for Plant Conservation is the latest in an illustrious line of conservation initiatives. It is to be hoped that it is an inspiration for conservation efforts in the Seychelles, Mauritius and beyond.

John Mauremootoo

(CAB International - Africa Regional Centre, Nairobi)

It is hugely impressive to see the Seychelles taking a lead amongst small island states in its commitment to plant conservation. The response to the Global Strategy for Plant Conservation is groundbreaking and will do much to secure the future for the priceless forests of the islands.

Tony Kendle (Eden Project, UK)

I remember the Seychelles as botanical jewels, extraordinary islands holding still largely intact forests with amazing endemic species. Nobody can forget their first sight of Lodoicea! The Seychelles Strategy for Plant Conservation is both a practical and an inspiring step to saving this unique heritage and will provide a vital guide to other island nations working to save their plant diversity. The plant conservation world needs good news stories and I am fully confident of hearing good news from the beautiful Seychelles. While the Seychelles share many of the chronic problems facing other oceanic islands I believe there is a real chance of saving the extraordinary botanical heritage that makes the Seychelles unique.

Mike Maunder

(Fairchild Tropical Botanic Garden, Miami USA)

My botanical work takes me all over the world but the islands, the flora and people of Seychelles remain uppermost in my thoughts. I have so many wonderful memories, including seeing Medusagyne for the first time, finding a flowering Protarum after searching for months and dashing over to Aride in a storm when I heard Rothmannia was in bloom.

Rosemary Wise (Kew Gardens, London)

Editorial

Welcome to this extra edition of Kapisen!

This special issue of Kapisen is devoted to Seychelles' National Strategy for Plant Conservation (NSPC) – and if you are thinking "oh, how boring", read further and discover that there are lots of exciting things going on in the world of plant conservation! Following a meeting of the Convention on Biological Diversity (CBD) in 2002, it was decided that plant conservation needed a boost. So, countries have been encouraged to develop national strategies to meet the plant conservation challenge. Seychelles is amongst the first and almost certainly the first small island state to develop such a strategy.

Why does plant conservation need promoting? There are many threats to our native plants: alien invasive species (e.g. clidemia; rats that attack seeds and seedlings); pests such as the spiralling whitefly and diseases such as takamaka wilt; habitat destruction and fragmentation (e.g. for housing development); over-exploitation of medicinal plants and other plants of value (e.g. coco de mer); extinction of pollinators. Climate change will have an effect too. Even bad luck alone may cause extinctions.

PCA and the Botanical Gardens took on the task of initiating the national strategy process. This issue of Kapisen gives an overview of what has already happened and where it may lead to. Denis Matatiken gives a first hand account of the national workshop that began the process in the article on p. 4-5. Many people were involved and 14 primary plant conservation targets were generated. Certain of these are highlighted in other articles. On pages 6-7 you can read about research on a rare endemic species (Targets 1-3) which will facilitate



The working group on education and awareness building at the NSPC workshop in Victoria (E Schumacher).

its conservation (Target 4). *Ex situ* conservation is also part of Target 4. We present the Barbarons Biodiversity Centre for *ex situ* plant conservation on page 13. One area which we often ignore is the conservation of rare crop varieties (Target 5). More can be found in the article on pages 10-12. The important role of education and awareness building in plant conservation (Targets 9, 10 and 11) is shown in a collage of pictures (p. 8-9).

There is great support for Seychelles' Strategy for Plant Conservation from all around the world, as can be seen in the messages of support that we have received (p. 2). We hope that many other people, locally and internationally, will lend their support through becoming actively involved in the implementation of the strategy. The role of PCA and Botanical Gardens is only as a galvaniser – it is important and necessary that all people who have an interest in plants take on a role, however small or large. Cartoons by Peter Lalande reveal this central message of the national strategy – that everyone's support is needed: the teacher at school, the lawyer drafting new legislation, those using medicinal plants, or the controllers at customs.

The National Strategy for Plant Conservation will appear in print by the end of the year. News of activities and success stories relevant to the achievement of the Strategy's targets will appear in the next and subsequent issues of Kapisen.

Katy Beaver, Eva Schumacher & Christoph Kueffer Editors

The electronic pdf version of Kapisen can be ordered from <u>boga@seychelles.net</u> or downloaded from <u>www.geobot.umnw.ethz.ch/staff/kueffer</u>

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NSPC Workshop

The National Strategy for Plant Conservation

By Denis MATATIKEN, Director Botanic Garden Section of the Ministry of Environment and Natural Resources, Seychelles boga@seychelles.net

Plants play a significant role in our daily life, but their conservation has always received less attention than the protection and conservation of animals. As a result of that, the Convention on Biological Diversity (CBD), which Seychelles ratified in 1992, has adopted decision VI/9 of the Global Strategy for Plant Conservation (GSPC) in an effort to strengthen and accelerate global action for plant conservation. The GSPC consists of a series of 16 outcomeoriented global targets for 2010. The CBD invites parties to develop national targets and to incorporate them into their national biodiversity strategies.

National targets will assist countries like Seychelles to protect its floral heritage from serious threats such as invasion by alien species and habitat fragmentation. It was therefore vital to call all local experts together to prioritise and streamline efforts towards plant conservation so as to derive maximum benefits from the limited resources available.

From March 16th to the 17th 2004, the Plant Conservation Action group (PCA), in collaboration with the Botanic Garden Section of the Ministry of Environment and Natural Resources (MENR) and Botanical Garden Conservation International (BGCI), organised a two day workshop to address pertinent issues relating to plant conservation in Seychelles and to formulate appropriate strategies and targets to reduce the rate of plant biodiversity loss. The aim was to produce a Seychelles National Strategy for Plant Conservation. Participants from government, NGOs and the private sector as well as individuals gathered together under the roof of the International Conference Centre in Victoria to discuss the best way forward.

The workshop was officially opened by Mr. Ronny Jumeau, the Minister for MENR, who stressed the importance of conserving our floral heritage since Seychelles is considered to be the second richest in biological diversity after Madagascar within the Indian Ocean region. He also mentioned the urgent need to address the issue of sustainable use of native flora since some species have gone extinct as a result of over-exploitation. In their opening remarks the PCA Chairman, Mr. Didier Dogley, and the BGCI Secretary General, Mr. Peter Wyse Jackson, introduced the participants to the objectives of the workshop and the context of the GSPC. The morning session ended with presentations from members of the National Park and Forestry Section as well as from the Botanical Garden Section of MENR on the present status of ex situ and in situ plant conservation programmes. The discussion that followed the morning presentations gave the participants the opportunity to focus on the most important issues lacking or being overlooked in the present system.

In the afternoon session of the first day the



Impression from the NSPC workshop in Victoria on the 16th and 17th of March 2004 (E Schumacher).

NSPC Workshop



The working group on sustainable use of plants at the NSPC workshop in Victoria (E Schumacher).

participants came together in topic related working groups of 6-8 persons. The group composition was based on their personal interest and professional background. Each group discussed one of the five objectives that structure the GSPC; (i) Understanding and Documenting Plant Diversity, (ii) Conserving Plant Diversity, (iii) Using Plant Diversity Sustainably, (iv) Promoting Education and Awareness about Plant Diversity and (v) Building Capacity for the Conservation of Plant Diversity. They were asked to identify in a **SWOT** analysis the **S**trengths, **W**eaknesses or gaps, the **O**pportunities that exist and possible **T**hreats to plant conservation in Seychelles.

The morning session of the second day started in a plenary where the group results of the SWOT analysis were discussed and completed. Then, the group members came together in the same working groups and were given the mandate to formulate SMART (S-specific, M-measurable, A-achievable, R- realistic, T-time-bound) targets related to their group objective. Each group came up with a total of four to five targets. By afternoon, all the targets were presented in the plenary and commented upon by the different stakeholders. By 4:00 p.m, the Chairman thanked all active participants for making the workshop a success and also extended his appreciation to the BGCI representatives for their time and devotion in the realisation of the workshop.

The following day a small group consisting of the PCA members, Botanic Garden Staff and the two BGCI facilitators, Peter Wyse Jackson and Stella Simiyu, went through the targets and came up with a first draft of the National Strategy for Plant Conservation (NSPC). The draft Strategy was circulated to all participants and to other local and international stakeholders and experts who were

unable to come to the workshop.

Having played a contributory role in the organisation and in the participatory process, the NSPC has equipped me with valuable and fruitful experiences in the efficient running of such a scientific workshop. It has given me ample opportunities to widen my administrative knowledge as well as to provide me with a deeper insight into plant conservation issues on a national scale. The chronological development of the strategies has enabled me to develop the required technique and also enhance my knowledge in the logical development of the national targets. The workshop has also improved the networking capabilities with the NGOs and other stakeholders present who made it a fruitful and an enriching experience.

The workshop has provided me with a clearer understanding of plant issues and also provided better insights in the planning and implementation of my work. There are some great challenges that lie ahead with regard to the leading role that the Botanic Section has to undertake as well as some contributory roles we will have to play to ensure that some of the targets are met in the next five years.

THE WAY FORWARD

PCA and the Botanic Garden Section being the lead organizations are aiming to integrate the NSPC in national strategies and action plans for future conservation work. This does not mean that all the responsibilities for any one target are left to us but rather that we will act as a driving force working in coordination with all the relevant 'actors'.

With this National Strategy in hand, we now have placed plant conservation on the national agenda. However, to succeed the engagement of each and everyone is needed. Only by working together will we eventually achieve its implementation and recognition.



Syzygium wrightii seedlings at the nursery in Barbarons (E Schumacher).

Belzamin sovaz (*Impatiens gordonii* Horne ex Baker)

By Alistair GRIFFITHS,

Eden Project & University of Reading (UK) <u>AGriffiths@EdenProject.com</u>

Belzamin sovaz (Impatiens gordonii) is an endemic Seychelles mist forest plant. It is an herb that lives for more than one year (perennial). The large white flowers occur in ones, twos and occasionally threes and are up to 5 cm wide, and display a spur up to 8 cm long. Impatiens means impatient, so called because of the explosive release of their seeds. It is thought that Belzamin sovaz is of African affinity with its closest relative being Impatiens walleriana (Hook. f.) a common cultivated plant in the Seychelles and throughout the world. Belzamin sovaz is one of the rarest endemic plants, with only two known populations left. One population is located on Mahé with 20 plants, the other on Silhouette with 100 plants. Belzamin sovaz was previously found on Mahé in three more locations (Morne Blanc, Cascade Estate and Morne Seychellois). No plants were discovered at these locations during fieldwork in 2001 and 2003.

I am a PhD student working on a species recovery plan for Belzamin sovaz, in collaboration with Eden Project, Seychelles Ministry of Environment and Natural Resources and the University of Reading. This project complements the Darwin Initiative works on propagation, nursery and establishment protocols for Seychelles endemic plants (see p.13). The project demonstrates that the conservation of a rare plant touches the wide range of complementary aspects laid out by the Seychelles National Plant Conservation Strategy (NPCS). Molecular studies aim to inform us about the levels of diversity and



Belzamin sovaz forms part of the exhibition in the tropical biome at Eden Project (C Kueffer).

fitness for the different populations. This helps to evaluate whether mixing them or keeping them separate is the best solution for re-introduction. Knowledge on reproductive biology is gained in the field and laboratory. Information gathered on distribution, demography, habitat and threats will ascertain its conservation status and inform conservation in the field. Studies on seed storage requirements and best practices in propagation and cultivation are underway to support *in situ* and *ex situ* conservation. In the following I list the results so far grouped according to the five objectives of the NSPC.

OBJECTIVE A: UNDERSTANDING AND DOCUMENTING PLANT DIVERSITY

Taxonomy, distribution and conservation status

- Morphological studies agree with Merlin & Grant (1985) and Wilson (1980) in that *Impatiens gordonii* is a distinct species.
- This work agrees with Carlström (1996) in that Belzamin sovaz should be categorised as being Critically Endangered.
- Belzamin sovaz has been reduced from five to two populations over the last 200 years (compare Horne 1875).
- Five organisations hold *ex situ* material of Belzamin sovaz: Eden Project (UK), The Royal Botanic Gardens Kew (UK), Brest Botanic Gardens (France), Biodiversity Centre Mahé (Seychelles), The Nature Protection Trust of the Seychelles (Seychelles).

Reproduction biology

- Belzamin sovaz takes between 23-28 days from pollination to seed production. The number of seeds produced per pod for the Silhouette population is 54 (±11) and for the Mahé population is 20 (±9).
- Trials indicate that Belzamin sovaz is easy to propagate from softwood tip cuttings. Cuttings produced 100% rooting in a period of three weeks.
- Seed propagation of Belzamin sovaz proved that the seed is viable and will germinate from both populations. When grown in compost germination was sporadic and occurs over a long period of time.
- Germination on 1% agar at 26° Celsisus with 12 hours light and 12 hours dark provided 100% uniform germination within 14 days.
- Preliminary works indicate that Belzamin sovaz has orthodox seed. If orthodox then it can be banked in a seed store.

OBJECTIVE B: CONSERVING PLANT DIVERSITY

Threats

- Alien invasive plant species (e.g. *Clidemia hirta* in the case of the remaining population on Silhouette) are encroaching the remaining populations.
- Belzamin sovaz is threatened by insect herbivory from *Hippotion eson* (The Common Striped Hawkmoth).
- Morphological observations of Belzamin sovaz revealed that plants from Mahé have deformed spurs and their stems, pedicles and peduncles are red whereas the Silhouette plants have normal spurs and their stems, pedicles and peduncles are green. It is thought that the deformed spurs in Mahé indicate inbreeding depression. Inbreeding depression occurs more commonly in small populations and is a factor that is thought to contribute towards the extinction of plant species.
- Crosses of Belzamin sovaz with the introduced species *Impatiens walleriana* were successful and resulted in a hybrid. *I. walleriana* is commonly cultivated in the Seychelles. It is recommended that any *I. walleriana* growing near Belzamin sovaz should be removed to prevent hybridisation.

OBJECTIVE D: PROMOTING EDUCATION & AWARENESS

- Deliberate nursery crosses of Belzamin sovaz with *I. walleriana* have produced a cultivar called *Impatiens* 'Ray of Hope'. This plant is being sold with permission from the Seychelles Government through Eden Project in the UK to raise awareness and monies towards conservation of Seychelles endemic plants.
- Belzamin sovaz was displayed at Chelsea Flower Show where Seychelles conservation issues were brought to the public arena. The displays won a Silver Gilt and a Silver medal.



100% germination of Belzamin sovaz seeds in a petri dish (A Griffiths).

OJECTIVE E: CAPACITY BUILDING

Much progress on Belzamin sovaz (*I. gordonii*) has been achieved over the past two years. However much more work is required before the PhD work will be completed by 2006. Implementing a species recovery for Belzamin sovaz can only be successfully achieved through continued capacity building, sharing information, building on good relationships and working in close collaboration with the Botanic Gardens section and the Seychelles Ministry of Environment and Natural Resources.



Alistair Griffiths is pollinating Belzamin sovaz (A Griffiths).

Literature

- **Carlström A. 1996.** Endemic and threatened plant species on the granitic Seychelles. Seychelles: Conservation & National Parks Section Division of Environment Ministry of Foreign Affairs, Planning and Environment. pp. 110.
- Horne, J. 1875. Report on the Seychelles Islands. *Transactions of the Royal Society of Arts and Sciences of Mauritius*, 9 53-75.
- Merlin CM, and Grant WF. 1985. Hybridization studies in the genus *Impatiens*. *Canadian Journal of Botany* 64: 1069-1074.
- Wilson, CG, 1980. Impatiens gordonii (Balsaminaceae). Curtis's Bot. Mag., 183: 33-35.

Collage of photos on the Education and Awareness targets

Text and Photos by Katy BEAVER <u>kbeaver@seychelles.net</u>

Life depends on plants! If people learn more about the significance of plants in their lives, they are more likely to wish to conserve the diversity of plants we have in Seychelles. Three targets in the NSPC are concerned with education and awareness, within both the formal education system and the public arena. But it is encouraging to note that the spread of knowledge about plants is already taking place in Seychelles. The photos on these pages show how.



The annual National Agricultural Show represents a wonderful opportunity to spread the word about plant diversity and plant conservation issues. The growing of rare crop varieties (plant genetic resources for food and agriculture), which is one of the targets of the NSPC, can be promoted at such an event, as can issues such as alien invasive plants and plant quarantine regulations.



Local television programmes about the environment, such as the one shown here, can be a valuable means of sharing plant conservation information with the public. One of the NSPC targets focuses on the use of media for raising awareness.



Rangers from the Division of Environment share their knowledge of wetland plants with school students. They also interact with communities living close to wetlands, helping people to understand the importance of wetland ecosystems (Photo: courtesy of Wetland Unit).



This is one small part of a wonderful new hand-painted exhibition about invasive species. It has been prepared by the Technical Section of the Natural History Museum in Victoria and will be travelling around to all districts so that everyone gets a chance to learn more about these threats to our biodiversity.

Issue 2

Kapisen

Education & Awareness



The tiny green plants which grow on rocks and tree trunks were the special interest of this group of Wildlife Club members, who are learning how to unlock the secrets of this miniature world (Photo: courtesy of Wildlife Clubs).



Creative use of plant materials on display at the 2004 Agricultural Show. People can be inspired by these examples – and what a great opportunity to make them aware of the need for sustainable use of such materials!



Eco-tourism is growing in importance in Seychelles. Leaflets produced by Forestry and National Parks which describe the various nature trails in the terrestrial National Parks help tourists to understand more about our endemic plants and to be aware of their significance in our environment, culture and history.



Wildlife Club members on a field trip which included investigating Seychelles' special insect-eating plants – Potao or Pitcher plant. Leaders play an active role in encouraging students to learn about plant diversity (Photo: courtesy of Wildlife Clubs).



Teachers have a very important role to play in spreading knowledge to young people. At the National Institute of Education, trainee teachers are encouraged to go on field trips, work on environment projects and prepare student worksheets about plants.

Issue 2

Kapisen

Crop Diversity

Jambion Jambrosa Jamalac a fruit jam session in Grand Anse

By Christoph KUEFFER & Eva SCHUMACHER, Geobotanical Institute, Swiss Federal Institute of Technology, Zurich <u>kueffer@env.ethz.ch</u> <u>eva.schumacher@env.ethz.ch</u>

Why a target on the conservation of rare crops in a National Strategy for Plant Conservation? Isn't it all about our native flora? Why should crops be threatened anyway?

When we compiled the comments from the stakeholders on the draft National Strategy, we realized that Target 5 on "Conservation of crop diversity in situ and ex situ" provoked the most reactions. So, we traveled to the Plant Genetic Resources research station (PGR¹) of the Ministry of Environment and Natural Resources (MENR) at Grand Anse to get first hand explanations. Mermedah Moustache, director of PGR, and Wilven Payet, manager of the PGR nursery in Grand Anse, met us at the entrance of a long alley of Myrtaceae trees. Soon we enjoyed our first bite from a ripe Jamalac fruit and thereby landed right in the middle of our topic. There is hardly a better group of fruit trees than the family of Jamalac (Syzygium samarangense), Pomme gouvernement (S.



A collection of fruits from Seychelles (E Schumacher).

malaccense) or Jambrosa (S. jambos) to discuss the myriads of slightly different tastes different varieties produce. They are perfumed fruits. Take Jamalac for instance. A whitish inside with a crisp juicy texture and a typical ephemeral taste, you may say apple-like, mixed with more or less background sweetness depending on the variety. In the case of Jambrosa the perfumed taste resembles rose water. Pomme gouvernement is sweeter and drier than Jamalac. Mr. Payet described the different tastes and textures of the fruit varieties with the precision of a wine expert. We dived into a new world of fruit wonders, and thereby almost forget what Myrtaceae so far signified for us, namely one of the tropical plant families with the most problematic invasive species: Gouyav-de-Sin (Psidium cattleianum), Jambrosa and many Eucalyptus species. Two invasion biologists in the devil's kitchen? Forget work, we thought, and tried next a dark-red, rather sour Jamblon (Syzygium cumini) plum. Jamblon baka is said to be the wine of Seychelles.

From the Myrtaceae we moved on to the Sapotaceae collection: the family of the emblem plant of our newsletter – Kapisen (*Northea hornei*), as well as of Bwa-d-Nat (*Mimusops sechellarum*). Knowing that the fruits of these two endemic species are eaten by fruit bats – fruit-eating connoisseurs par excellence, we expected new discoveries. We were not disappointed with Chiku (*Manilkara achras*) and Zapote (*Pouteria campechiana*).

The fruits we encountered on our walk through the PGR collection sounded like fruits from a fairy tale: Cherimolia, Corossol, Coeur de Boeuf, Durian, Carambole, Bilimbi, Mambolo, Mamie Sapote, Mangoustan, Jubjub, Breadfruit and Rima. However, we were most impressed by the extensive orchards of avocado and mango trees. You can walk through a forest of old and majestic mango trees and another forest of avocado trees. And the amazing thing is that every tree is different. There is every month throughout the year at least one avocado tree fruiting, and the avocado fruits are from purple and black to green and yellowish. Some are small and round, others larger and elongated. Some are buttery and creamy, others drier and more suitable for a diet. According to our guides nowadays Seychellois prefer the large, buttery and creamy ones. In the 1932 Agriculture annual report we read: "The small Mauritian variety of avocado was locally liked because of the firmness of its meat". We'd say, let's preserve different varieties of avocado for the changing preferences of the future generations of Seychellois.

Crop Diversity



The PGR avocado orchard in Grand Anse (E Schumacher)

Time is short for conserving the collection of crop varieties of PGR. The first trees were planted in the late 1970s and since then the number of specimens has grown every year. By the 1980s there were 120 different varieties of Mango, and 80 different varieties of Avocado in the collection! However, for the last 15 years PGR had to struggle to keep its collection alive. Funding decreased as agriculture declined and other major threats are poaching and housing development. Today, only 60 varieties of Avocado trees are left. In fact, the problem is not just a local one. On an international scale the loss of crop varieties is intensively discussed under the terminology of "Plant Genetic Resources for Food and Agriculture (PGRFA)". A global action plan was adopted in 1996². It lists the rationales for conserving crop diversity: First of all, it is the basis for food security in a country. Crop diversity buffers the risk that global change phenomena such as new diseases or climate change pose. With more varieties the chance is greater that there is one which is resistant to say the spiraling white fly, or that is adapted to a changing climate. In the Seychelles particularly, where the microclimate and soils are very variable on a small scale, different varieties are adapted to different local conditions. This allows a sustainable production that depends

less on herbicides and artificial fertilizers. Last but not least, local crops and the associated local knowledge and farming practices are part of the cultural heritage of a country.

Fortunately, the PGR staff used their imagination and came up with several innovative ideas on how to save the remaining crop diversity. At the biodiversity center in Barbarons (see p. 13) they secured 11 ha for an *ex situ* collection of local crops. In parallel, they started an inventory of the crop diversity on farms (*in situ*). An employee of PGR visits week after week private farms and asks them what fruit tree and vegetable varieties they have on their land. The data is then entered into a national plant diversity database hosted by the Botanical Gardens.

Footnotes:

¹ For further information contact: pgr@seychelles.net ² FAO. 1996. Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and the Leipzig Declaration. FAO, Rome.

Crop Diversity



A mang blanc tree grafted with four other varieties of mangoes (E Schumacher).

Another project works with the slogan "Every Home a Garden". Seychellois are encouraged to keep a small garden in their backyard. At this year's agricultural show in Victoria PGR showed what can be fitted into a small patch of land. If every home garden in the Seychelles would harbor just one rare crop variety, 18'000 rare crop individuals could be saved! For us, the best example of how much diversity a small patch of land can host, was one particular mango tree in the mango orchard: a mang blanc tree that was grafted with one branch of Raspuri mango, one branch of mang rouge, one branch of mang sable, and one branch of maison rouge. On a single tree there were five different varieties of mangoes that taste differently and fruit in different seasons.

The replanting of rare crops in home gardens may be a first step in remembering what agriculture still meant a few decades ago to Seychellois. Just think, in 2001 Seychelles imported 1200 tons of fruits. For instance, 460 tons of apples, 150 tons of pineapples, 80 tons of pears, and 27 tons of lemons! In Seychelles, school children proudly eat their apple for lunch, while in Switzerland they go for the banana. The Seychelles imported in the last few years fruits and vegetables for some 50 million rupees per year1! Such an import oriented agricultural sector is not sustainable. It is a load for the Seychelles economy, and aggravates the foreign exchange problem. But also, imported fruits and vegetables may be produce unsustainably abroad and threaten plant diversity elsewhere, while small-scale sustainable production in the Seychelles would be possible. Eco-tourism that builds both on Seychelles nature and cultural heritage, and offers tourists local products such as handicrafts and fresh fruits may be one promising way forward for the Seychelles tourism industry². Local crops may well play an important role in a future sustainable Seychelles economy.

Many bites of fresh fruits and fruit stories later we were at the end of our walk through the PGR gardens and we were reminded of our own mission: What about the risk of introducing new potentially invasive plants? For instance, just before we came back to our car, we saw a recently introduced new variety of Indian Jubjub (Ziziphus mauritiana), a shrub that is invasive in Fiji and Australia. Well, we think that the only solution is a close collaboration between those that introduce new species and those that manage natural areas. The knowledge about the risk of a species becoming invasive is just one more factor that has to be taken into account when using a new crop. Whether a species is likely to become invasive should be part of the local knowledge attached to a crop, just as is information about where and how a certain crop grows best, and which variety produces the best fruits for a satini, salad or fruit juice.

One thing is for sure, crop diversity does not only mean certain varieties of plants but also the traditional knowledge and local stories that go with them. And so, we drove home with a bag full of fresh fruits, and a memory full of new recipes and stories.

Footnotes:

¹ Beaver, K. and C. Morel 2003. Learning for Sustainable Living in Seychelles. Nature Seychelles, Mahe.

² Günther, S. 2004. Sustainable Tourism Development on La Digue Island, Republic of Seychelles. Transdisciplinary Methods for Sustainable Solutions in a Tropical Paradise. Master Thesis. Geobotanical Institute & UNS, ETH Zurich.



Jamalac fruits (E Schumacher).

The Seychelles National Biodiversity Centre at Barbarons

For threatened plant species, often the only successful short-term conservation measure is to grow them in nurseries, so called *ex situ* conservation. The long-term goal of *ex situ* conservation is to re-establish viable populations in the wild (*in situ*).

In 1998 an ambitious *ex situ* conservation program of the Seychelles' endemic flora started. The long-term goal is to propagate all endemic plant species *ex situ* and to provide plants of as many endemic species as possible for re-establishment in the field and for habitat restoration. The *ex situ* nursery is managed by the Botanical Gardens Section of the Ministry of Environment and Natural Resources (MENR) and is situated at Barbarons on the western coast of Mahé. The project is funded by the Seychelles government and other funding agencies. The development of protocols for propagating endemic plants was partly funded by a Darwin Initiative grant and supported by the Eden Project (UK).

A team of about 30 staff lead by Damien Doudee has been so far successful in propagating – from seeds or from cuttings – about 50% of the endemic flora of the Seychelles.

Photographs from the nursery at Barbarons and from plants successfully grown by this project can be found throughout this 'Kapisen' issue. The successes include many rare species such as *Drypetes riseleyi*, Vateriopsis sechellarum, Rothmannia annae, Mimusops sechellarum, Impatiens gordonii, or Seychellaria thomassetii, but also some of the most appreciated local medicinal plants such as *Pittosporum senacia* subspec. *wrightii*, *Psychotria pervillei* or *Dodonea viscosa*. This proves that local medicinal plants can easily be grown in home gardens. The utilization of medicinal plants must not be a threat to the endemic flora (compare NSPC sub-target 8b).

Common endemic species propagated at Barbarons in larger numbers are of special interest for habitat restoration. For instance, a purely endemic palm forest with all 6 endemic palm species has been planted on abandoned land next to the nursery in Barbarons and will be open to visitors next year. For the future, an information center, a research center, a biodiversity museum and botanical garden presenting complete samples of all major habitats of the Seychelles are planned.

Even though there are many successes, some challenges for *ex situ* conservation still await a solution. For instance, the endemic *Craterispermum microdon*, exploited heavily for medicinal purposes and becoming rare in the wild, can easily be germinated from seeds, but dies before reaching reproductive age.



Damien Doudee and a young *Drypetes riseleyi* tree in Barbarons (L Kronauer).

Our cartoonist: Peter Lalande

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Peter Lalande illustrated this Kapisen with four cartoons. He is by profession director of the national archives. As an amateur cartoonist he has a special interest in nature and things related to the environment. At the moment he is working on a new comic book project: A kid called Zak who protects the environment. Another comic book entitled "Nature's sense of humor" is completed. At the moment Peter is looking for a sponsor to publish it.

Forthcoming

The next issue of *Kapisen*, published in November 2004, will include the new regular feature "Success stories from the Seychelles' National Strategy for Plant Conservation". Contributions are welcome until October 2004. Contact the editors at evaschu@gmx.ch.

NSPC Main Targets

Understanding and documenting plant diversity

- Target 1.Establish a widely accessible and comprehensive information
resource on the Seychelles plant diversity with a focus on
dicotyledons, monocotyledons and ferns.
- Target 2.Establish and implement a monitoring and evaluation framework for
native species.
- Target 3. Develop and implement a national plant research agenda.

Conserving plant diversity

- **Target 4.** Conservation of threatened flowering plant taxa *in situ* and *ex situ*.
- Target 5. Conservation of crop diversity *in situ* and *ex situ*.
- Target 6.Review, harmonise and effectively implement national legislation
on the conservation of biodiversity.
- **Target: 7.** 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.

Using plant diversity sustainably

 Target 8.
 All native plants of socioeconomic value are available only from sustainable production.

Promoting education & awareness about plant diversity

- **Target 9.**Raise public awareness of plants and ecosystem conservation
issues through the national media and other means.
- **Target 10.** Publications and resources about local plants made widely available to support public awareness on plants and their conservation.
- **Target 11.** Ensure that plant conservation and biodiversity issues are incorporated within the formal education curricula and informal education, including extra-curricular activities.

Capacity building for the conservation of plant diversity

- **Target 12.** Improve capacity amongst government, the NGOs and private sector, to implement the National Strategy for Plant Conservation and achieve its targets.
- **Target 13.** At least double the existing or available funds for plant conservationfrom foreign sources, government and private sectors.
- Target 14.Strengthen a broad-based national network for plant conservation
as required to achieve the targets of the National Strategy for Plant
Conservation.



Acting against invasive species



Using plants sustainably



Linking legislation with plant conservation



Education & awareness building