



In situ Conservation of Crop Wild Relatives in SADC Region

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ITPGREA Side event CWR and Protected Areas. 8 Oct 2015

Wild Caffeine free *Coffea mauritiana* Lam.

Profile of SADC Crop Wild Relative

In situ Conservation and Use of Crop Wild Relatives in three ACP countries of SADC Region – (Short Name - SADC Crop Wild Relatives)



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REPUBLIC OF SOUTH AFRICA

'In situ conservation and use of crop wild relatives in three ACP countries of the SADC region' (short name - SADC Crop Wild Relatives) is a three-year project (2014-2016) co-funded by the European Union and implemented through the ACP-EU Co-operation Programme in Science and Technology (S&T II) by the ACP Group of States. Grant agreement no. FED/2013/330-210.

The challenge

- CWR are neglected and threatened in the wild
- Importance of CWR is not well recognised
- Many CWR are present in protected areas, but are not taken into account PA management plans
- Identification of useful traits within CWR



Objectives of SADC CWR project

Overall objective:

Enhance link between conservation and use of CWR in three ACP countries within the SADC region, as a means of underpinning regional food security and mitigating the predicted adverse impact of climate change

Specific objectives:

- **Enhance the scientific capacities** within the partner countries to conserve CWR and identify useful potential traits for use to adapt to climate change.
- **Develop exemplar National Strategic Action Plans** for the conservation and use of CWR in the face of the challenges of climate change across the SADC region

Training Needs Assessment

- To assess capacities on in situ conservation and use of CWR in SADC region
- Survey was carried out in each 3 partner countries as well as SADC region - SPGRC

Key findings :

- Expertise on CWR was limited
- Lack of capacity in taxonomy, ecogeographical survey, Seed handling, climate change modelling, data management and analysis
- Data quantity and quality on CWR are poor and accessing data within the SADC region
- Lack of policies on CWR



Regional training workshop on in situ conservation of CWR

Mauritius November 2015

- 26 participants from 14 SADC countries

Topics:

- Creating CWR checklists and inventories
- Prioritization of CWR for conservation
- Conservation status assessment of priority CWR
- Plans for implementation of conservation priorities
- Relevant policy for the conservation of CWR



Regional training workshop on predictive characterization and pre-breeding

Pretoria, South Africa, April 2015

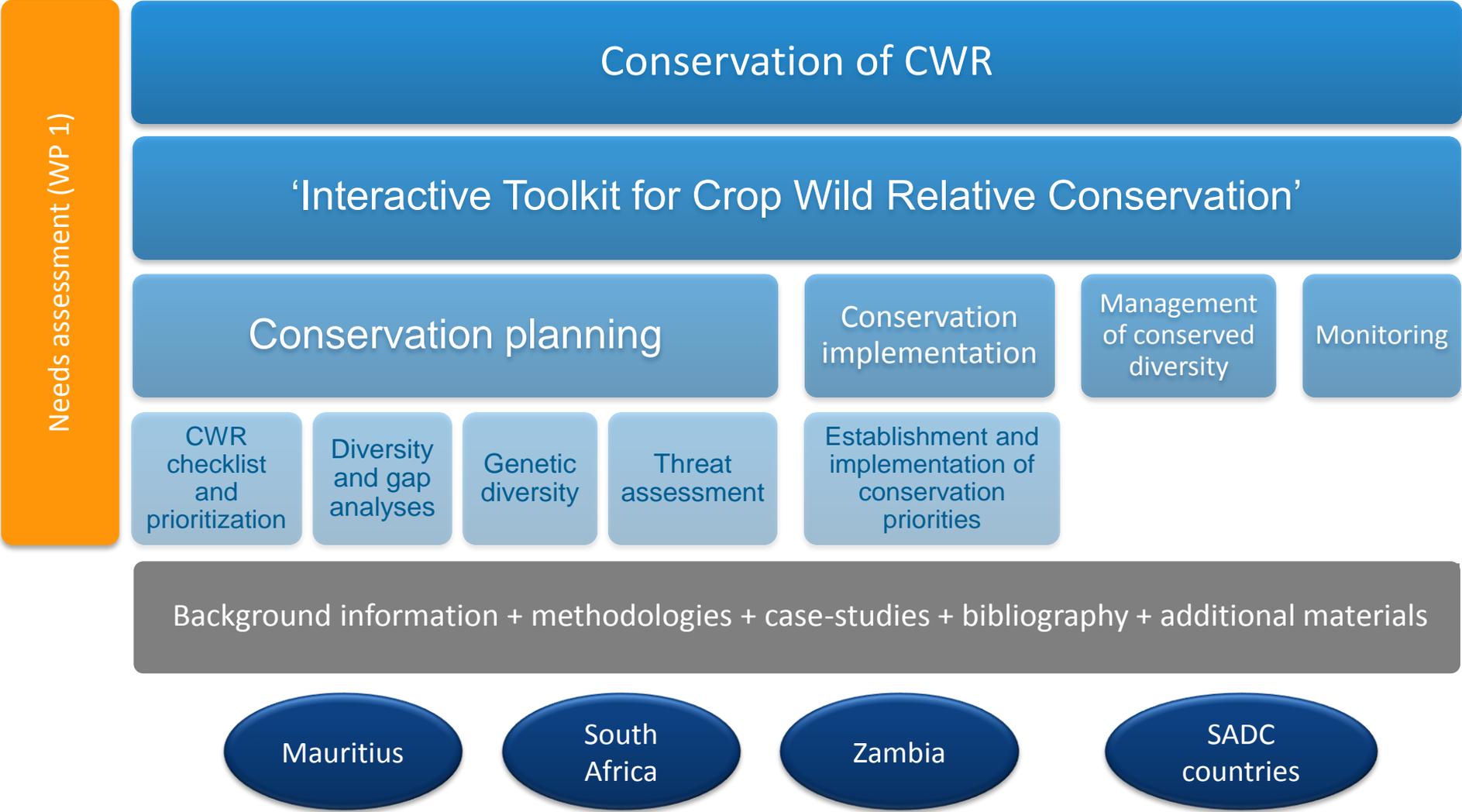
23 participants from 9 SADC countries

Topics

- Application of eco-geography in PGR
- Predictive characterization of a selected CWR for a specific trait
- Use of CAPFITOGEN tools
- Definition and application of pre-breeding
- Genebank operations critical to pre-breeding programmes
- Principles for parental selection and the generation and management of variation
- Outline of actions that promote the use of CWR diversity for inclusion into National Strategic Plan for the conservation and use of CWR



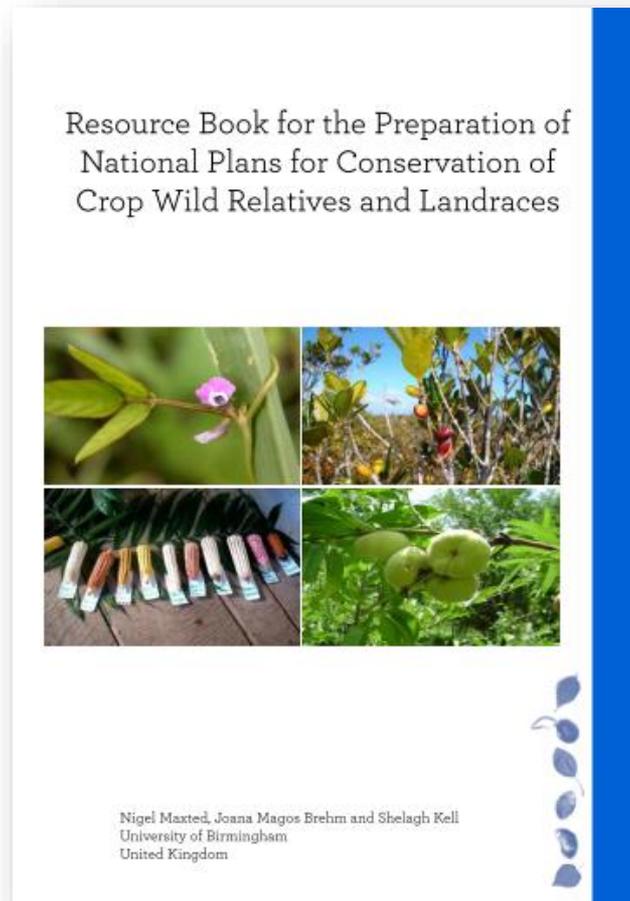
Develop toolkits for the conservation and use of CWR



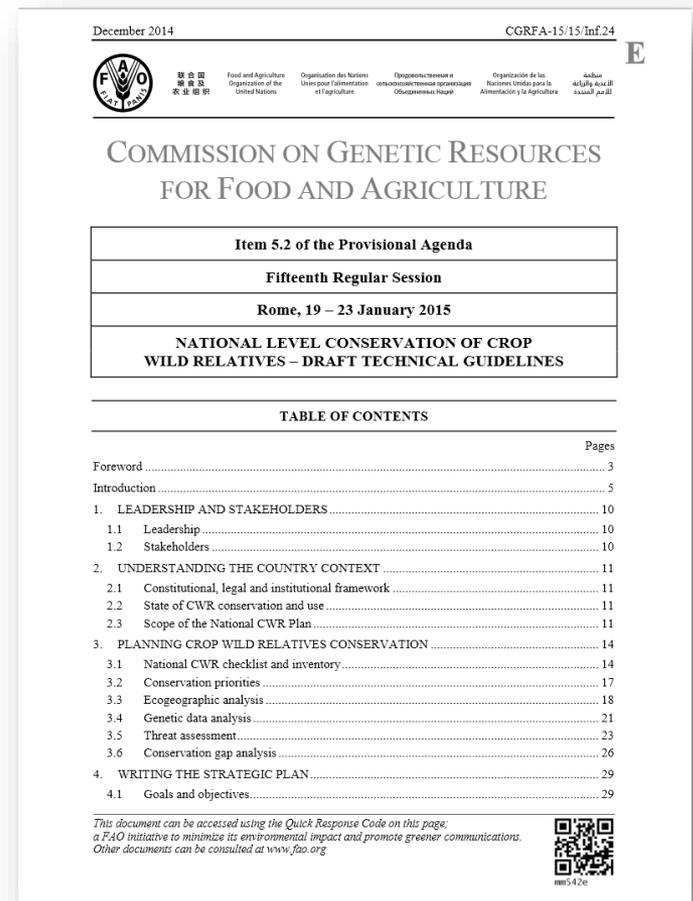
'Interactive Toolkit for CWR Conservation' - backbone

Commissioned by
FAO Commission on
Genetic Resources for
Food and Agriculture

To aid countries
formulate National
Strategic Action Plans
for the conservation
of CWR and LR



http://www.fao.org/fileadmin/templates/agphome/documents/PGR/PubPGR/ResourceBook/TEXT_ALL_2511.pdf



<http://www.fao.org/3/a-mm542e.pdf>

National Strategic Action Plans, supported by information systems, for *in situ* conservation and use of priority CWR

Activity 3.1

Compile baseline information on diversity, conservation status and threat of targeted CWR in the 3 partner countries (including CWR inventory, ecogeographic survey, genetic diversity, collection of georeferenced data, database) into web-accessible national registries, with linkages to the global Crop Wild Relatives web portal

Activity 3.2

Identify regional and national *in situ* CWR hotspots and priority sites for *in situ* conservation and *ex situ* collection validated through expert interviews and field visits using innovative GIS technology

Activity 3.3

Predict which CWR *in situ* populations and materials from *ex situ* collections have traits adapted to extreme climate conditions (e.g. heat, drought) using Focused Identification of Germplasm Strategy (FIGS) or other GIS approaches

Activity 3.4

Develop exemplar Strategic Action Plans (SAP) on *in situ* conservation and use of priority CWR in three participating countries

Compile baseline information on diversity, conservation status and threat of targeted CWR - methodology

Compilation of baseline information

- Compile national **CWR checklist**
- **Prioritize checklist** for the CWR taxa most likely to be used by national breeders
- Collect and **compile existing data** about distribution, demography, species biology, threats, genetic diversity, conservation status, traditional knowledge, and local uses of priority CWR
- Carry out **in-field surveys** to generate occurrence data of and assess threats to populations of priority CWR

Develop web-accessible national registries

- Develop **database and web portal software** adapted to CWR *in situ* conservation data, making use of existing CWR data standards
- Write **documentation and user guide** for application
- **Deploy the application and train partners** on its use
- **Import** previously compiled country data into the application
- Develop **data sharing agreements** for sharing selected data with a global portal

Overview – 3 countries

PRIORITIZATION METHOD

PRIORITY CWR

PRIORITY CWR RELATED CROPS

MAURITIUS

CWR related to food crops prioritized.

Scoring and sum of scores used to further prioritize CWR related to food crops.

Top 10 in each Mauritius and Rodrigues.

10 + 3 in Mauritius
10 in Rodrigues

MAURITIUS: coffee (*Coffea*), olive (*Olea*), fig (*Ficus*), Indian olive (*Elaeocarpus*), fonio (*Digitaria*)

RODRIGUES: Aloe, millets (*Digitaria*, *Panicum*), Asparagus, sweet potato (*Ipomoea*), olive (*Olea*), fig (*Ficus*)

SOUTH AFRICA

Scoring and sum of scores.

Score ≥ 11 (out of 26) + all GP1-GP3 taxa that didn't score ≥ 11

292 taxa

Sweet potato (*Ipomoea*), eggplant (*Solanum*), rooibos tea (*Aspalathus*), millets (*Digitaria*, *Echinochloa*, *Eleusine*, *Panicum*, *Paspalum*, *Setaria*), cucumber/gherkin and melon (*Cucumis*), yam (*Dioscorea*), etc

ZAMBIA

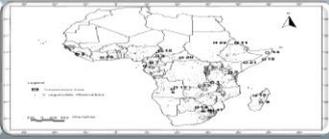
Scoring and sum of scores.

CWR grouped according to range of scores (high, medium, low)

34 taxa

Cowpea (*Vigna*), yam (*Dioscorea*), rice (*Oryza*), Sorghum, cucumber/melon (*Cucumis*), millet (*Eleusine*), sweet potato (*Ipomoea*), Pearl millet (*Pennisetum*), eggplant (*Solanum*), etc

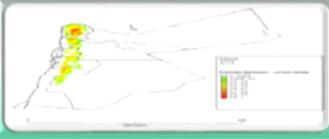
Activity 3.2: Diversity and hotspot analysis



Diversity analysis (hotspot, complementarity, ecogeographic, combination of both)



In situ and *ex situ* gap analyses



Climate change analysis

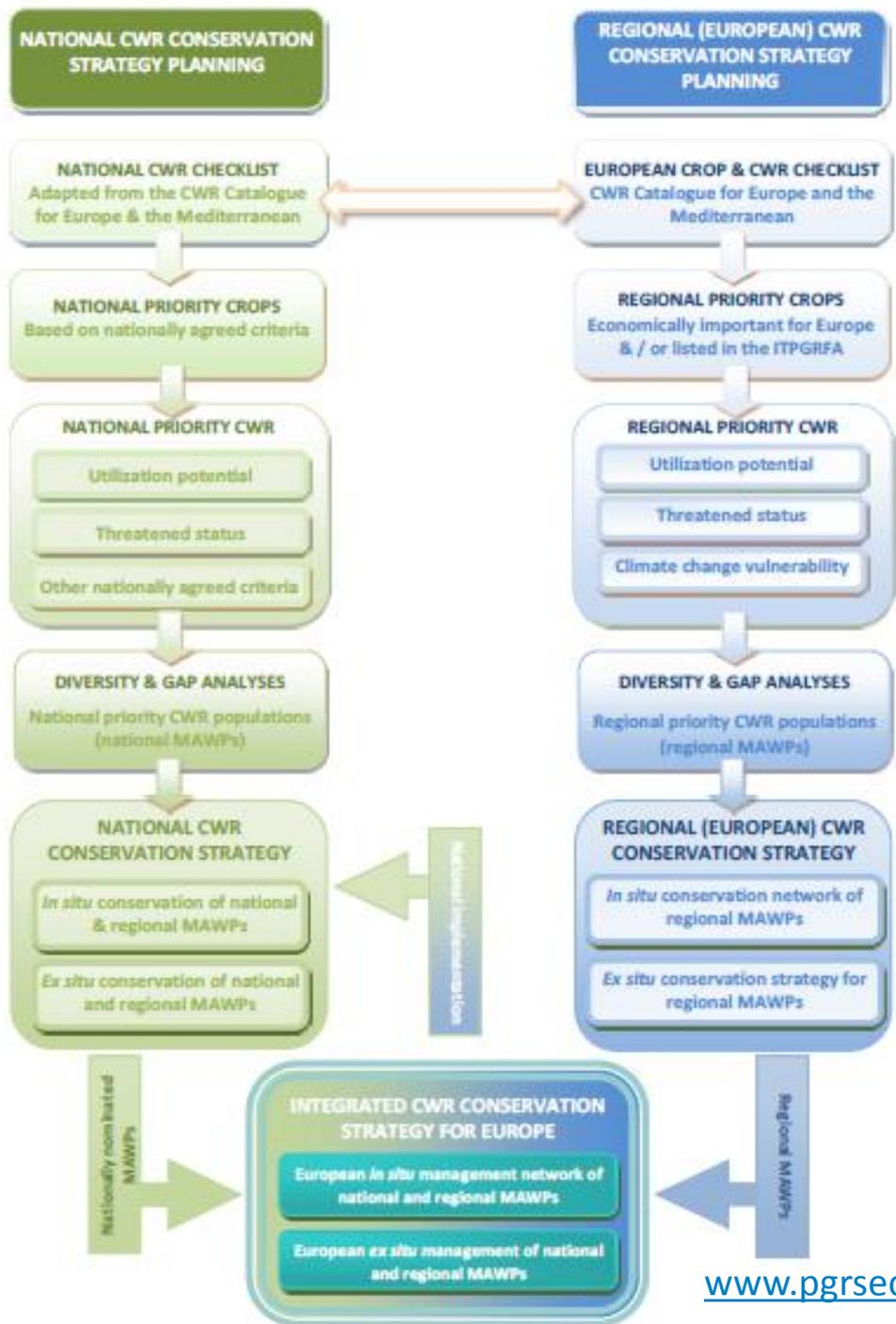


Conservation recommendations



Validate identified sites through expert interviews and field visits to verify spatial extensions of populations, threats and occurrences

MU, ZA,
ZM, SADC



TWO CORE LEVELS OF CONSERVATION PLANNING

Maxted *et al.*, 2015

PRIORITIES FOR REGIONAL CONSERVATION ACTION?

60 food/beverage crops/crop groups reported by FAO in the SADC region

34 food/beverage crops in the SPGRC base collection

27 other cultivated food or beverage species in the SPGRC database

In total, 91 food/beverage crops/crop groups cultivated in the region

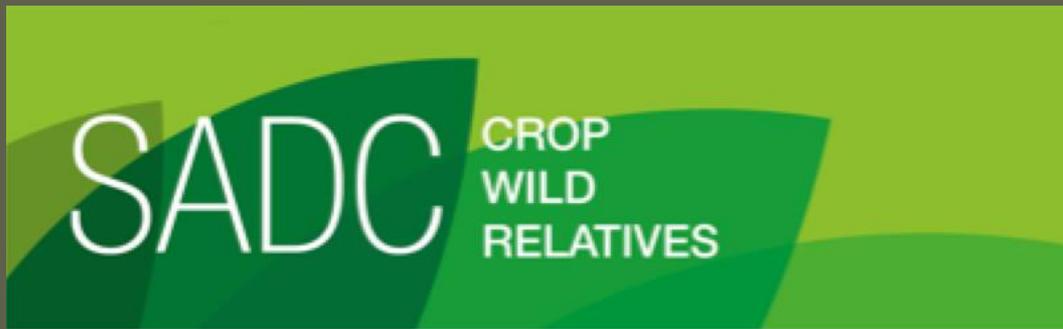
731 CWR species related to 75 of these crops/crop groups occur in the SADC region

Conclusion- Key outputs

- Capacity of over 50 participants from SADC Member States in *in situ* conservation and use of CWR has been strengthened by project
- An interactive toolkit for conservation of CWR published and shared
- Detailed checklist and inventory of CWR in each of the three partner countries have been developed;
- Hotspots of priority CWR sites will be identified in each country for *in situ* conservation intervention including protected area establishment, based on diversity and hotspot analysis
- **Three National Strategic Actions plans (NSAP) for CWR conservation and use**
- Regional assessment of CWR within SADC region



Thank you



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