In situ Conservation of Crop Wild Relatives in SADC Region

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ITPGREA Side event, CWR and Protected Areas, 8 Oct 2015
Profile of SADC Crop Wild Relative

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

‘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

Conservation of CWR

‘Interactive Toolkit for Crop Wild Relative Conservation’

Conservation planning

Conservation implementation

Management of conserved diversity

Monitoring

Needs assessment (WP 1)

CWR checklist and prioritization
Diversity and gap analyses
Genetic diversity
Threat assessment
Establishment and implementation of conservation priorities

Background information + methodologies + case-studies + bibliography + additional materials

Mauritius
South Africa
Zambia
SADC countries
Resource Book for the Preparation of National Plans for Conservation of Crop Wild Relatives and Landraces

Nigel Mason, Joan Magos Brehm and Sheilagh Bell
University of Birmingham
United Kingdom


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

<table>
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<tr>
<th>Activity 3.1</th>
<th>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</th>
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<tr>
<td>Activity 3.2</td>
<td>Identify regional and national <em>in situ</em> CWR hotspots and priority sites for <em>in situ</em> conservation and <em>ex situ</em> collection validated through expert interviews and field visits using innovative GIS technology</td>
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<td>Activity 3.3</td>
<td>Predict which CWR <em>in situ</em> populations and materials from <em>ex situ</em> collections have traits adapted to extreme climate conditions (e.g. heat, drought) using Focused Identification of Germplasm Strategy (FIGS) or other GIS approaches</td>
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<td>Activity 3.4</td>
<td>Develop exemplar Strategic Action Plans (SAP) on <em>in situ</em> conservation and use of priority CWR in three participating countries</td>
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**Compile baseline information on diversity, conservation status and threat of targeted CWR - methodology**

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<th>Compilation of baseline information</th>
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<td>• Compile national <strong>CWR checklist</strong></td>
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<td>• <strong>Prioritize checklist</strong> for the CWR taxa most likely to be used by national breeders</td>
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<td>• Collect and <strong>compile existing data</strong> about distribution, demography, species biology, threats, genetic diversity, conservation status, traditional knowledge, and local uses of priority CWR</td>
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<td>• Carry out <strong>in-field surveys</strong> to generate occurrence data of and assess threats to populations of priority CWR</td>
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<th>Develop web-accessible national registries</th>
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<td>• Develop <strong>database and web portal software</strong> adapted to CWR <em>in situ</em> conservation data, making use of existing CWR data standards</td>
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<td>• Write <strong>documentation and user guide</strong> for application</td>
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<td>• Deploy the application and train partners on its use</td>
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<td>• Import previously compiled country data into the application</td>
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<td>• Develop <strong>data sharing agreements</strong> for sharing selected data with a global portal</td>
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## Overview – 3 countries

### Prioritization Method
- Scoring and sum of scores used to further prioritize CWR related to food crops.

### 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

#### South Africa: 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

#### Zambia: cowpea (Vigna), yam (Dioscorea), rice (Oryza), Sorghum, cucumber/melon (Cucumis), millet (Eleusine), sweet potato (Ipomoea), Pearl millet (Pennisetum), eggplant (Solanum)
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
www.pgrsecure.org/documents/Concept.pdf
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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