

SADC CWR NETWORK

Bridging agriculture and environment:
Southern African crop wild relative regional network

Webinar

Crop wild relative conservation in protected areas in the SADC region

8th and 9th February 2021

10.00 to 12.00 UTC time

Report



Day 1

- Dr M. Ehsan Dullo (Alliance of Bioversity International and CIAT)
- Ms Christine Mentzel (BIOPAMA)
- Dr Joana Magos Brehm (University of Birmingham)
- Dr Gloria Otieno (Alliance of Bioversity International and CIAT)
- Ms Prishnee Bissessur (Alliance of Bioversity International and CIAT)

Day 2

- Dr M. Ehsan Dullo (Alliance of Bioversity International and CIAT)
- Ms Christine Mentzel (BIOPAMA)
- Prof Nigel Maxted (University of Birmingham)
- Prof Jose Iriondo (Juan Rey Carlos University)

Webinar agenda (see Annex 1)

Webinar objectives

The objectives of the two days' webinar were to: (i) introduce protected area managers to the value of crop wild relatives (CWR), (ii) provide an overview of the methodologies used in CWR conservation planning to identify sites for the CWR *in situ* conservation, (iii) raise and discuss the Access and Benefit Sharing (ABS) of *in situ* genetic resources within the SADC protected areas, (iv) and provide protected area managers with practical guidelines on how to manage the target CWR populations in the protected areas where they are being conserved. The guidance for protected area managers included the design and implementation of a management plan (habitat characterization, population threat assessment, management interventions, monitoring schemes, etc.) for CWR conservation, management of CWR to address climate change, and linkages *to ex situ* collections.

Day 1: 8 February 2021

Dr Dullo, the project coordinator of the Darwin SADC CWR Network project and co-organiser of the webinar, welcomed all the attendees and gave the floor to Ms Mentzel to introduce the BIOPAMA programme. Ms Mentzel, BIOPAMA Regional Coordinator for Eastern and Southern Africa, gave a broad introduction to the BIOPAMA programme and its main objectives of providing information and tools to support decision making for effective protected areas management, through the [Regional Resource Hub \(RRH\)](#), capacity building and action component, a competitive grant mechanism that seeks to improve on-the-ground management and governance in protected areas. She also highlighted the strong link between protected areas and CWR wild relative conservation. Her opening remarks were then followed by the presentation of Dr Dullo, who gave an overview on what CWR are, their relative importance in the SADC region for food security, and the implementation of the Darwin SADC CWR Network project.

Next, Dr Joana Magos Brehm from the University of Birmingham gave a comprehensive presentation on how to carry out conservation planning of CWR, from creating a national checklist, priority checklist, occurrence data collation and related diversity, gap and climate change analyses to identify the key hotspots or target sites for conservation and also the development of the national strategic action plans. Dr Gloria Otieno from the Alliance, then presented on the theme of Access and Benefit Sharing of CWR in the SADC region, especially focusing on the existing guidelines and policies, such as the Nagoya Protocol and the International Treaty for Plant Genetic Resources for Food and Agriculture. She also gave some of the preliminary results of a survey conducted on the perceptions of national focal points on the ease, constraints and potential improvement regarding access and benefit sharing of *in situ* plant genetic materials, including CWR.

Q&A session 1

The series of presentations was followed by a Q&A session chaired by Dr Dulloo. The following questions were raised during the session:

Shelagh Kell asked whether the project intends to identify the overlap between the regional and national priority sites for CWR conservation and if there will be any investigation on how to conserve the non-priority taxa which occur in the same priority sites as the priority taxa. Dr Magos Brehm answered that she has not yet investigated the matching of the sites at regional and national level, which is an important aspect to investigate, however, some of the national sites have been already identified as priority. She replied that the project does not look into the non-priority taxa, but it is an important issue that would imply collation of occurrence data of those species and the protected managers can identify additional taxa to conserve in the area. Dr Dulloo added that there has been a capacity building programme in the SADC region on conservation planning for CWR and an on-going mentorship for other countries is being done and they should be able to conduct hotspots analyses.

Nigel Maxted asked if given that we want to make *in situ* conservation in the region sustainable, breeders and users should have access to *in situ* material. There is a similar situation in Europe where the idea of on farm conservation of the landraces or *in situ* conservation of CWR be done by the protected managers or individual farmers is unsustainable as they have no history of providing *in situ* material, have no training how to do it and might be busy with their own activities, so the suggestion made was that the genebanks or genetic resource centers act as a mediator in provision for the genetic materials who would take away the responsibility from the local protected manager or the farmers, who will have to simply provide a duplicate to the genebanks and the latter would provide it to the user community.

Dr Otieno replied that this is one of the best practices seen in the region, for example in Uganda, genebanks go to private individuals or communities, collect and map the taxa, so that in the future, the user can go directly to the genebank to access the material. In Uganda, specifically for plant genetic material used for food and agriculture, regardless of who is conserving the species/landraces, the germplasm can be accessed through Standard Material Transfer Agreement and through the national genebank which also reduces transaction costs related to negotiations. She added that there is where the SADC Plant Genetic Resources Centre (SPGRC) can act as an institution which can enable the users to have access to the germplasm with low transaction costs.

Howard Maimbo asked about the *in situ* conservation approaches to be taken in conserving the priority CWR taxa in protected areas. Dr Dulloo replied this is a very important question which will be covered in the second day session by Prof Jose Iriondo who will give clear guidelines on how to develop measures to conserve the *in situ* wild populations.

Shelagh Kell questioned about the potential role of genebanks in providing access to *in situ* conserved germplasm. Dr Otieno replied that there is a complementarity between *in situ* and *ex situ* conservation, some of the collections of the CWR can be kept as duplicates in genebanks, especially for breeders. If genebanks are involved in *in situ* mapping of the material, users can go directly to the genebank, so they would be playing a central role, especially for the CWR in the list of the 64 crops and in the public domain.

Shelagh Kell also asked about who would ensure the collection and the quality of seeds for the *in situ* material conserved in the protected areas. Dr Otieno answered that there is where the institutional coordination is needed and has already been identified as a gap, in terms of protected area managers and genebanks working together, not only for the complementarity between *in situ* and *ex situ* conservation, but also creating inventories, collections, mapping and providing access. Sometimes, direct provision from protected areas can be complicated, depending on which authority they fall under, therefore there needs to be a clear process where institutions that provide and use the material, they can reduce the transaction costs by coordination of the process.

Day 2: 9 February 2021

The second day session started with the welcome address by Ms Mentzel, followed by the presentation of Prof Nigel Maxted from University of Birmingham, who talked about the lessons learnt from the global and European experience on building of mutually beneficial collaboration by linking protected areas and CWR conservation. Prof Jose Iriondo then talked about guidelines of how to manage CWR populations within protected areas, where he gave a detailed overview of the different steps to CWR population management, such as how to do

population threat assessment, development of the management plan and monitoring and evaluation.

Q&A session 2

Bob Redden pointed out that genome editing provides a key opportunity to transfer traits from CWR to crops but requires ample preliminary genetic work to identify the gene sites involved and added that *in situ* storage does predicate some knowledge of the storage longevity of each species. Prof Maxted agreed that gene editing does require knowing where the adaptive alleles are and added that it would be interesting to see how much genomic analysis/characterization of both *in situ* and *ex situ* materials as there is already a substantial backlog on the matter for *ex situ* material and it can be presumed that it would be even worse for *in situ* germplasm. To link *in situ* to users, the initial idea of contacting the protected area managers and individual farmers was impractical, the pragmatic way would be to do it via the genebank which can guarantee the benefit back to the host country. Regarding the longevity, the materials would go in the genebank and not be regenerated, to cut the costs for maintenance. In the *in situ* context, regular samples would be provided to the gene banks, for example, every 15 years.

Shelagh Kell asked about the how will the conservation of species found outside protected areas will be ensured in the SADC region. Prof Maxted replied that it is important to investigate conservation of CWR outside protected areas, for example, providing a subsidy to farmers who can maintain CWR in disturbed areas such as farmlands. Adam Drucker investigating the scenario of paying farmers to maintain CWR within the project. Dr Dulloo added that the project is also looking into this aspect and it is important to promote among policy makers about the need for CWR conservation, engaging with local communities to provide benefits and collectively take care and manage these populations. In the previous EU-ACP project, in Zambia, farmers showed interest in maintaining these populations who recognize their importance and contribution to breeding. Prof Iriondo mentioned that in Spain, for conservation outside protected areas, they have contacted municipalities who are interested in biodiversity conservation, can provide bare lands around towns and cities for conservation activities.

Adam Drucker highlighted that payment for ecosystems services can be applied to CWR, how to create incentives for farmers to urge them to maintain the wild plants in their communities for public good, both national and global. This is being looked into the Darwin project and in Zambia, farming communities do recognize and are willing to conserve CWR at low cost, and there is a need to see whether there is a trade-off both in terms of conservation within or outside protected areas.

Bob Redden questioned about cross-pollinating crops could develop into natural hybrids, which farmers growing landraces tend to weed out, but with some incentives, it could benefit the farmers by supplying those hybrids. Prof Iriondo agreed that it is context dependent, and it is common practice in some countries, crops having cross pollination with wild relatives in their area, which increases the genetic diversity that can be advantageous for the farmers, but in other cases, some of the hybrids are not of interest to the farmers, but to researchers. However, to maintain the integrity of the wild relatives, one must be careful about the genetic pollution from crops occurring nearby. Prof Maxted commented that he has been contributing to the development of genetic resources conservation strategy of Tajikistan where there are many landraces which are projected to be heavily impacted by climate change. He recommended the deliberate introgression of the climate change resistant traits into the landraces to maintain them on farm, rather than allowing them to be lost. Potentially, if there are CWR populations, active introgression of climate resilient traits in the wild populations may be needed to help the species to not go extinct, especially in cases of major crops and close wild relatives.

Closing remarks

Dr Dulloo said that there is no global information platform on plant genetic diversity that are *in situ*, which is a gap to be addressed. At the level of the Alliance, attempts have been made to fill in this gap, through for example the Root, Tubers and Bananas Research Programme has been working to establish a knowledge base to provide information about these key crops and their diversity hotspots.

About the conflicting management measures, as a manager, one needs to look at the trade-offs and develop strategies on how to ensure that the diversity that may not be conserved *in situ* is safeguarded, by for instance, collecting the material and sending them to genebanks, so there is need to be flexible and iterative to maintain the genetic diversity of the materials. He encouraged the protected areas managers to work more collaboratively with plant genetic resources centres to send their *in situ* germplasm to genebanks for backup, this will be helpful to build the link between *in situ* and *ex situ* conservation and use.

Ms Mentzel concluded that the webinar was very insightful in terms on the importance of CWR, the role of protected areas in their conservation, the approaches and mechanisms that can be undertaken. She added that through the BIOPAMA programme, she will continue to advocate for the conservation of CWR in the protected areas of the southern and eastern African region as well as improve the awareness on CWR as an ecosystem service that protected areas may provide.

Both Dr Dulloo and Ms Mentzel thanked the participants, the panelists for their presentations and co-organizers and look forward to the continued collaboration.

Appendix 1



Webinar

Crop wild relative conservation in protected areas in the SADC region

8th and 9th February 2021

10.00 to 12.00 UTC time



Supported by the Darwin Initiative and funded by the UK Government.

Rationale

Crop wild relatives (CWR) are wild plant species that are closely related to crops (including crop progenitors). CWR populations are potential sources of traits that may be used in crop improvement, such as resistance to pest or diseases, yield improvement, or tolerance to abiotic stresses such as drought, heat or flooding—adaptive traits which are particularly important for providing crop stability in the rapidly changing environmental conditions brought about by climate change. It has been shown that the SADC region is a diverse region for wild relatives of a number of crops of regional and global importance, with over 1900 wild species related to coffee, cucurbits, eggplant, lettuce, millets, okra, pulses, rice, sorghum, watermelon, among others (Allen *et al.* 2019).

Despite their unique value for food and economic security, CWR are not adequately conserved *in situ* (in their natural habitats) even if they occur within existing protected areas throughout the SADC region (Magos Brehm *et al.* in prep.). Their active management and conservation in the protected areas of the SADC region is therefore an opportunity not to be missed, not only because it adds significant value to these areas but also because CWR can be effectively conserved with minimal additional effort and investment.

These two webinars aim at (i) introducing protected area managers to the value of CWR, (ii) providing an overview of the methodologies used in CWR conservation planning to identify sites for the CWR *in situ* conservation, (iii) raising and discussing the Access and Benefit Sharing (ABS) of *in situ* genetic resources within the SADC protected areas, (iv) and providing protected area managers with practical guidelines on how to manage the target CWR populations and the protected areas where they are being conserved, including the design and the implementation of a management plan (habitat characterization, population threat assessment, management interventions, monitoring schemes, etc.), integration of the conservation of CWR in the management of the protected areas, management to address climate change, and linkage to *ex situ* collections.

Webinars organizers

- University of Birmingham
- Alliance Bioversity International and CIAT
- BIOPAMA

Final agenda

(UTC)

DAY 1: 8 February 2020 (tentative dates)		
10:00	Welcome remarks	BIOPAMA
10:10	In situ conservation of Crop wild relative and overview of the Darwin Initiative project SADC CWR Network	Ehsan Dullo (Alliance)
10:20	CWR conservation planning	Joana Magos Brehm (UoB)
11:00	Access and Benefit Sharing (ABS) of <i>in situ</i> genetic resources within protected areas	Gloria Otieno/Prishnee Bissessur (Alliance)
11:30	Q&A	All
12:00	End of the webinar	
DAY 2: 9 February 2020		
10:00	Start of day 2	BIOPAMA
10:10	Building mutually beneficial collaboration: linking protected area and CWR conservation, lessons learnt from European experience	Nigel Maxted (UoB)
10:40	CWR population management guidelines in protected areas	José Iriondo (Universidad Rey Juan Carlos)
11:30	Q&A	All
12:00	End of the webinar	