

A Global Strategy

for the conservation and use
of Coconut Genetic Resources

2018-2028

Compiled by R. Bourdeix and A. Prades



2.2.2 Conservation *in situ*, on-farm and beyond *ex situ* collections

In situ and on-farm conservation of coconut germplasm refers to the maintenance of coconut genetic diversity in its natural habitat or through the continued cultivation of landraces or traditional varieties in the agro-ecosystems where they have evolved. Therefore, it involves the protection of the areas, ecosystems and habitats in which the plants have developed their distinctive characteristics. This way of conserving genetic resources should be facilitated through legislative and policy measures as well as through the use of incentives.

The great advantage of *in situ* conservation is that it maintains the evolutionary processes of the species and its traditional varieties in a dynamic way. Its main drawback is its vulnerability to social and economic changes. Many factors contribute to the erosion of *in situ* genetic diversity: drastic changes in land use; adoption by farmers of high yielding varieties; lethal diseases; rural drift; development of urban areas, and anthropogenic or natural disasters.

Data from many countries shows that a great diversity of coconut is kept on farms, and that coconut farmers often prefer to plant their traditional Tall varieties instead of the recommended new ones. Genetic and agronomic criteria are insufficient to explain the distinction made by farmers between coconut varieties. From an anthropological perspective, varietal assessment is not a free or isolated process. Farmer evaluations are often based on their traditional varieties, which are already known and used as reference. This comparison has less to do with the biological characteristics of the plant than with its qualities as a cultural entity within a human community (Bourdeix et al. 2008).

Sustainable *in situ* conservation requires community participation, control of land rights in local communities, systematic documentation of farmers' knowledge of coconut diversity, a gendered approach, education, extension and development of environmental awareness. Of equal importance is the principle that any *in situ* conservation programme must also benefit local communities and promote gender equity. In coconut growing areas, evidence shows that the level of conservation of existing stands strongly correlates with the extent of profitable coconut-based farming systems/enterprises on farm (Sangalang 2004). This suggests that such coconut-based enterprises are critical to successful on-farm/*in situ* conservation of coconut genetic resources. Management by local communities can often develop effective links to national efforts concerning documentation, conservation and use. This attracts commercial and private agencies to be partners in on-farm conservation efforts and can lead to linkages between public, community and private sectors in plant genetic resources conservation.

Through the support of the Department for International Development (DFID), UK, the Asian Development Bank (ADB) and the International Fund for Agricultural Development (IFAD), a COGENT project testing *in situ* conservation strategies was

implemented in 35 communities of 15 coconut-producing countries¹⁰. Working in poor coconut growing communities, this project assessed the technical feasibility, financial viability, social acceptability and environmental safety of coconut-based technologies and production systems, namely: (1) producing and marketing high-value products from all parts of the coconut – kernel, husk, shell, wood, water, leaves; (2) intercropping cash and food security crops/integrating livestock; and (3) propagating important local and introduced high-value coconut varieties in community-managed nurseries and conserving them *in situ* and on farm.

This project had a consistent impact on poverty alleviation in the targeted communities and on *ex situ* coconut conservation. Eighty-nine (89) farmers' coconut varieties were identified and a total of over 62,000 seedlings from these varieties were planted on community farms. Results of this project also outlined issues for optimizing the *in situ* conservation approach:

- The project was conducted in too many communities and countries with regards to the limited funds available. Not enough research time was devoted to specific genetic resources aspects, and especially the characterization of traditional varieties.
- From a communications and awareness perspective, farmers' involvement in conservation of genetic resources was insufficiently promoted, valued and secured for the long term. The publication of a "Catalogue of farmer's varieties", although initially planned, was cancelled. This was due to a lack of reliable data; the poor web visibility of these communities and supplies of their coconut products not being sufficiently assured for promoting community involvement, helping them to market their products, and serve as example and success story.
- In some communities, palms from traditional varieties chosen by farmers as seednut providers were located at less than 20 meters from Dwarf x Tall coconut hybrids. The cross/open pollinating habit of these Tall-types has certainly led to unwanted varietal mixing.

The results contributed to the formulation of an international recommendation¹¹ during the 2012 COGENT SC meeting. This recommendation invites researchers to develop alternative concepts of conservation.

2.2.3 Revisiting the classical delineation between *in situ* and *ex situ* conservation

Many different locations could integrate the conservation of coconut genetic resources and even seed production by using a multifunctional land management policy.

¹⁰ Bangladesh, India, Sri Lanka, China, Indonesia, Malaysia, the Philippines, Thailand, Vietnam, Fiji, Papua New Guinea, Ghana, Tanzania, Mexico and Jamaica. Report available at: http://www.cogentnetwork.org/images/publications/PRCGC_Vol1.pdf

¹¹ Assessment and improvement of farmers' technical and traditional knowledge regarding coconut biology, in order to increase farmers' autonomy for production of good planting material. Available at the URL: http://www.cogentnetwork.org/images/2012_sc_meeting/cogent_recommendation_3.pdf