

Policy issues within the spectrum of yam genetic resources conservation on Yap Island

Dr. Murukesan V. Krishnapillai

Critical issues

The economy of Federated States of Micronesia in general, and Yap Island in particular, is still subsistence based. This means the FSM is dependent on local biological and other natural resources for survival. Yam is one of the two major tuber crops that have sustained the lives of Yap islanders since time immemorial. It not only provides food but also stands as an important component of islands cultures. Thus, on Yap agrobiodiversity conservation is much more than an ecological and economic issue, it is also social and cultural issue. One of the most critical issues that threaten the traditional yam cultivation in Yap in recent years is related to changing weather patterns. Frequency and intensity of tropical storms and typhoons are of significant importance to conservation of yam genetic resources in small Island States. Small island States are more vulnerable to such extreme hazards exacerbated by climate variability and coastal flooding. Yap Island is no exception. Owing to its geographical location (about 10⁰ north of the equator), storm gains its momentum due to Coriolis Force by the time it approaches Yap. Between 1960 and 2004, 12 typhoons passed within 75 nautical miles of Yap. At least two of these typhoons were Category 3 typhoons, including typhoon Sudal that devastated Yap Island on April 9, 2004. Its effect was more profound because its path was directly over Yap and movement was slow. In addition, according to Joint Typhoon Warning Center, Hawaii, year 2004 was a record year for storms in the western Pacific. Between January and June 2004 alone, 11 tropical storms were reported in the vicinity of Yap. All of these tropical storms have had debilitating effect on the natural vegetation. Typhoon Sudal devastated most of the island vegetation leaving some stumps of coconut trees and the like. Over 95% of the yam farmers reported loss of stored tubers due to coastal flooding. Most climate change models predict more frequent typhoons, hence it is prudent to be prepared. Such natural disasters are indeed the most intimidating and calls for action from planners and policy makers. The rapid increase in number of tropical storms and typhoons and their magnitude of threats highlight the need for the greater effort to be placed for agrobiodiversity conservation in the immediate future.

Policies needed

- (i) Government should give priority to protect its vulnerable genetic resources of food and agriculture from genetic erosion induced by extreme weather patterns
- (ii) Appropriate conservation strategies (*in-situ*, *ex-situ* or integrated) be initiated at the national level and State level to protect the genetic resources for food and agriculture from erosion induced by extreme weather patterns
- (iii) National legislation developed and passed to support FSM commitments under all major international environment conventions – Climate Change, Biodiversity, Desertification, Transport of Hazardous Wastes etc.

Why policies needed?

Federated States of Micronesia is signatory to several international treaties including Convention on Biological Diversity (CBD), UN Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Montreal Protocol, UN Convention on the Law of the Seas etc. The FSM ratified the CBD in 1994 and prepared National Strategy and Action Plan report in

2002 as a prerequisite to the CBD. Agrobiodiversity emerges as one of the key themes of nation's NBSAP report. Although conservation and sustainable use of agrobiodiversity is one of the objectives therein, the threats for the genetic resource base induced by extreme weather patterns do not find a place in the document. If this small island nation were to protect its genetic resources for its future generation, immediate conservation steps need to be implemented at each State level depending upon the target species. Thus, in the State of Yap, yam genetic resources call for immediate conservation plans owing to extreme vulnerability due to extreme weather events like tropical storms. Defngin (1959) reported 34 yam cultivars belonging to two species of *Dioscorea*, namely, *D. alata* and *D. esculenta*. Research and field work carried out by the present author between 2002 and 2004 revealed not more than 30 cultivars. Whether the cultivars have become extinct or not is a matter of debate, however, experience from one of the worst typhoons in the history of Yap points to the fact that farmers have lost at least some of the invaluable cultivars resulting from flooding, and powerful winds that destroyed the yam trellises.

What need to be done?

Complimentary conservation strategies combining *in-situ* and *ex-situ* methods need to be initiated to protect the yam resources from extinction induced by changing weather patterns. Since both methods have their own merits and demerits, a complimentary strategy will be suitable. In *ex-situ* methods, crops can be conserved *in-vitro* in the established tissue culture facility of the FSM. *Ex-situ* method will protect yam resources from natural disasters while conservation measures within the FSM will provide an added advantage to the farmers with access to their crops. Concurrently, *in-situ* conservation gardens need to be established at several locations of the State that will allow natural process of evolution and adaptation. Moreover, *in-situ* concept applies the principle of conservation to all three levels of biodiversity – ecosystem, species and genetic diversity. Conservation of these three levels of agrobiodiversity, and the various interactions that they support, contribute to the overall principle of ecosystem health in local farming system. Also, *in-situ* conservation program has significant potential to improve the livelihoods of farmers at the local level. Farmers will benefit from the continued agricultural biodiversity and ecosystem health that *in-situ* conservation supports. Crop resources like yam are the basis of initiatives to increase crop production or secure new marketing opportunities. By building development efforts on these resources by protecting them natural disasters and through empowerment of farming communities, *in-situ* conservation can lead to sustainable livelihood improvement.

As part of the NBSAP process, the FSM under the guidance of The Nature Conservancy (TNC) brought a blueprint for conserving its biodiversity. It is based on ecoregional planning by designing a portfolio of high priority conservation areas representative of the biodiversity of a particular ecoregional, and conserving that portfolio through direct action and multi-area strategies. Based on a series of workshops, TNC identified several areas of biodiversity significance and priority actions areas for future in-depth studies. In general, this blueprint present 'area specific' conservation manifestoes rather than 'species-specific' programs. Thus, for conservation of genetic resources like yams, species-specific conservation programs need to be developed.

During the 3rd Economic Summit, the FSM Government's Environment Sector Strategic Plan outlined the rationale and the need for a holistic approach to conserving and protecting the nation's natural environment. The purpose of this plan is to guide policy makers in allocating funds to support the development of environment initiatives, projects and programs deemed necessary to conserve and improve natural environment and promote sustainable natural resources management.

Analysis of constraints

The FSM signed UNFCCC on 12 June 1992 and ratified on 18 November 1993. FSM also signed Kyoto Protocol to the UNFCCC on 17 March 1998. In the Framework Convention, it was agreed that by all that those bearing the responsibility for causing the problem must take the lead in solving it. Yet, the leadership is missing today, especially when many of the Pacific islands, including the FSM facing dire threat from increased frequency and intensity of tropical storms. Absence of universal acceptance of and support for the Kyoto Protocol is also hindrance to the small island states like the FSM.

Globally, Kyoto Protocol was a positive achievement toward the reduction of greenhouse gases. However, this has been converted by some governments into a political target. Reports show that United States produced 6862 million metric tons of greenhouse gases in the year 2002, about 0.5% growth in total greenhouse gas emission. It is paradoxical, however, US has not yet signed the Kyoto Protocol and yet extend millions of dollars under Federal Emergency Management Agency (FEMA) relief measures when tropical storms disrupts the social setting of the FSM.

Mr. Redley Killion, Vice President of the FSM recently pointed out the constraints of adaptation and mitigation as stated in Article 2 of the Convention during a high-level panel discussion on adaptation of COP-10, UNFCCC in Buenos Aires. Micronesia strongly urged to adopt measures to ease funding mechanism for the implementation of national level adaptation programs. Efforts of the small island countries such as the FSM have been hampered by the addition of rules and procedures that makes it all the more difficult for the FSM and other small island states to access funding sources. The proposed framework for resource allocation being considered by the Global Environment Facility was also of concern to the FSM.

Currently very limited financial support is available for conservation research. Following the recommendation made in the NBSAP, a non-governmental organization named Micronesia Conservation Trust (MCT) is established under the FSM laws to support biodiversity conservation and related sustainable development. MCT is the nation's funding mechanism for biodiversity conservation projects. However, at this time the funding mechanism targets 24 priority areas identified by the TNC's blueprint. Under the Compact of Free Association with United States, the FSM is expected to receive considerable resources for various environment related projects.

Natural hazards such as those associated with extreme weather events, climate change, high tides and sea-level rise has had serious impacts on the natural environment. These threats are further magnified in the FSM due to

- i) inadequate technical capacity of National, State and local governments, NGOs and communities;
- ii) inadequate financial resources, both from internal and external sources, dedicated to the sector;
- iii) inadequate monitoring programs and other feedback to decision-makers; and
- iv) outdated National, State and local laws and policies and insufficient enforcement.

Current indicators suggest that the present government environmental agencies, partnerships, and policies are failing to adequately address the environmental changes and effects induced by the changing weather patterns.