

Rehabilitation Strategies for Tsunami Affected Coconut in Asia and the Pacific

1. The Tsunami

Tsunami, the unforeseen havoc which started its appearance suddenly in the morning of 26th December 2004 with tidal waves of 15 - 30 m height with force and weight of water had caused great damage to millions in the Asia-Pacific. There were huge loss of properties to the natives of the region. Many have lost their near and dear. The life in the coastal cities and villages were paralyzed totally. The tsunami also had affected the crops including the perennial coconut palms. In Asia, the countries like Indonesia, Sri Lanka, India, Thailand, Maldives and Malaysia were affected drastically by the tsunami but the severity of damage was more in the Nanggroe Aceh Darusalam in Indonesia, followed by Sri Lanka and India. In Thailand and Malaysia, the intensity of loss to coconut and coconut based cropping system is comparatively less.

2. Coconut and Tsunami

Coconut plantations were badly affected in Indonesia followed by India when compared to other countries. Nanggroe Aceh Darusalam is the major area where the coconut plantations severely affected in Indonesia. This province is having 116,642 ha of coconut covering 19 districts with an annual production of 78,442 tonnes of copra equivalent and productivity of less than one tonne copra equivalent / ha/year. In this province, about 178,928 smallholders are depending on coconut. The reports revealed that although only an area of 19,000 ha of coconut plantations was destroyed in tsunami, it had really affected the entire area in some way or other. The greatest damage to coconut occurred in Aceh Besar where 5,537 ha owned by

5496 farmer families were destroyed. In Aceh Jaya another 2,480 ha owned by 1,530 farmer families were destroyed. In most of the places, it was surprised to see that the only vegetation remaining is a few coconut palms besides some casurina trees. These coconut palms have provided food and drink to the affected people till they get their food from other sources. The logs of fallen trees and the living coconut trees



Severely damaged coconut trees in Nanggroe Aceh

have also been cut and the woods were used to build up the rehabilitation shelters with other woods.

In India, the coconut

plantations in Andaman and Nicobar Islands were worst affected followed by Nagapattinam, Cuddalore, Tiruvaur, Thanjavur, Kanyakumari, Tuticorin and Ramanathapuram in Tamil Nadu and Union Territory of Pondichery in the East Coast and in Kollam and Alappuzha districts of Kerala in the West Coast. When salt water tidal waves hit on the root zone of palms the leaves became yellow and lower whorl became dried off in some places. Roots were got exposed due to soil erosion. More particularly, in Nicobar Islands, a vast stretch of coconut palms were washed away along with soil flora and fauna. About 6000 ha coconut gardens were reportedly affected in the Andaman and Nicobar Islands (but still correct statistics are not become available). In Sri Lanka, it was reported that not much coconut palms were affected.

2.1. After effects of Tsunami in coconut

- Uprooted coconut trees either broken or toppled and completely dried young

palms were seen in all affected areas.

- Soil health was affected greatly and soil became sick with salt water. Increased pH, soil erosion, soil siltation with sea sand and water logging are the major effects.
- Roots of coconut palms got exposed due to soil erosion and roots started drying in some cases.
- Existing coconut palms showed symptoms such as yellowing and browning of leaves, drying of lower whirl, button shedding, immature nut fall, etc.
- All other crops like annuals and biennials like banana, papaya, pineapple, etc and perennial tree crops like cocoa, arecanut, clove, nutmeg, black pepper, fruit trees were destroyed in most of the areas leaving a lot of debris.

2.2. Anticipated loss due to loss of coconut palms

- A 0.1 million tonnes of coconut oil production is estimated to be reduced annually due to loss of coconut palms, button shedding, nut fall and lower productivity.
- There will be considerable reduction in raw materials like coconut, husk, etc for the processing industries which may reduce the availability of raw material to the processing units which in turn will reduce the existing employment rate and also the income to the growers, processors and the labourers who depend on this crop.

3. Rehabilitation Strategies

Coconut, the 'Tree of Life' needs to be rehabilitated in the affected coastal regions urgently but systematically. There should be short-term and long-

term strategies to rehabilitate the coconut based coastal ecosystem which is fragile.

3.1. Short-term strategies

- i) To rehabilitate the areas where coconut trees were completely lost, it is necessary to plant coconut seedlings with wider spacing of 9-10 m with a provision to raise annual, biennial and perennial crops in a systematic manner.
- ii) For replanting adequate number of quality planting materials of coconut as well as intercrops/mixed crops are required. Particularly, coconut being a perennial crop care should be taken right at the beginning of planting to get quality planting materials.
- iii) Selection of good mother palms in the existing areas as well as nearby areas have to be taken up immediately and collection of seed nuts have to be done in the next 3 months for raising the nurseries for planting in the next year.
- iv) Seedlings have to be raised not only in government farms but also in community nurseries involving the coconut growers in a farmer's participatory approach. This will decentralize the nursery activities, besides, reducing the cost of raising the nursery as well as transport of seedlings to the needy farmers. This will also pave way for meeting some income through raised nurseries. But the seed nuts from selected mother palms identified by the scientists should be collected by the department officers and handed over to the farmers for raising nurseries. Even the NGO's can also be involved in producing quality planting materials. This will ensure the production of adequate seedlings and reduce the burden of

the development departments where resources including manpower and other facilities are limited.

- v) Similarly, the seeds/seedlings/planting materials like grafts are also to be produced and made available to the farmers to raise inter/mixed crops. While seeds of vegetables, flower, etc can be directly purchased from reliable source by the government department and can be supplied to the farmers. The seedlings, tubers, suckers of banana, and grafts of other crops like cocoa, clove, nutmeg, black pepper, etc, are to be produced using the same strategy of identifying good sources and can be supplied to the farmers as well as NGO's for raising the nurseries.
- vi) Farmers should be advised to go for a coconut based cropping/farming system approach with annuals like vegetables, tubers, bananas, medicinal plants, flowers, etc, biennials like pineapple and perennial fruits and spices so that right at the first year, they will get income from annuals. If vegetables are grown, they may get income within 3 to 4 months. Live stocks like sheep and other milch animals, poultry, ducks, etc can also be integrated. If farm ponds are available, production of fish also can be done along with coconut and banana on bunds.
- vii) If community approach of a group of selected farmers will be taken up, coconut cultivation coupled with farm level processing and the marketing of the produce become an easy process.
- viii) The concept of Farmers Field Schools (FFS), a school without building but field as the place for

learning to be set up in the tsunami affected areas for proper training and transfer of technology, distribution of planting material to make aware the farmers about the techniques of plant protection and farm level processing, etc in a participatory approach. This will be a long lasting solution to make the farmers competitive.

there is problem of Brontispa beetle and hence it is suggested to set up bio control laboratory for mass multiplication of parasitoids and entomopathogens for both the pests and released/applied as and when required. Farmers need to be properly educated on these bio control methods.

3.2. Long-term strategies

- ix) For improving the soil health, growing green manure crops like daincha, sesbania, sunhemp, in addition to organic manures, vermicompost, etc to be popularized. In the areas where large accumulation of organic biomass are available easily, the same can be composted and the farmers should be trained to make their own compost/vermicompost. The farmers are also to be encouraged to grow green leaf manure plants like glyricidia around the farm at the outer bund which will be a good source for green leaf manure. Periodically, the young branches with leaves can be cut and incorporated. Growing cowpea will yield vegetable as well as green manure which can add nutrients to soil.
- x) Heaping the soils in the coconut plantations in small heaps (mounds) just before rainy season and spread the same after rainy season will help to reduce salt as is practiced in south Kerala in India. Salt will be washed away during rainy season.
- xi) Since there is a risk of fast multiplication of rhinoceros beetle in all tsunami affected areas where a lot of debris are accumulated, it is necessary to take up bio-control methods to control rhinoceros. In Aceh, in addition to rhinoceros,

- i) Establishing mangroves wherever possible and also go in for other shelter belts with casuarina and coconut which are able to withstand tsunami to a greater extent when grown in compact rows. It would be worth to establish 10 to 15 rows of casuarina with 1.5 m spacing to act as a barrier. After that coconut can be raised in rows. Live shelter belts will have a long lasting effect if properly maintained with periodical gap filling.
- ii) Since the productivity of coconut in most of the coastal areas is below one tonne of copra equivalent, and in particular in Aceh, it is less than 0.8 tonne, it would be worth to rejuvenate the coconut plantation which has the old and senile palms in 40,000 ha area in a phased manner replanting with quality planting materials.
- iii) Encourage the farmers to start integrated farm level processing by linking farmers and private processors in partnership mode for increasing the income from coconut.
- iv) Encouragement should be given for value addition and product diversification using coconuts and its by products. Husk, though has many utilities like coir, coir pith, geotextile, coir pith compacts, briquettes, etc, have not been fully

utilized.

Manufacturing of virgin coconut oil is another small scale technology that can be promoted. Processing of coconut based food products can also be popularized. These activities will provide a lot of employment opportunities.

- v) Impart training to artisans and women to manufacture furniture from senile and dead coconut wood and handicrafts using various parts of coconut. Small-scale units have to be encouraged by providing seed money for its set-up.
- vi) In the midst of surviving coconut palms, there are high yielding palms which have to be studied to identify best cultivars, which can withstand the adverse tidal waves.
- vii) It is also necessary to set up a lot of Farmers' Field Schools (FFS) and an integrated Coconut Development Project including processing and marketing of pilot project in these areas to promote this concept.

All these activities will provide employment opportunities and sustainable income for social security.

4. APCC's Approach

Asian and Pacific Coconut Community which is the oldest single crop community started in 1969 for coconut on the advise of UNESCAP which has 15 member countries of which 7 are in Asia and 8 in Pacific region, would like to tackle the rehabilitation issue in two ways viz. (i) Organizing consultative group meeting of experts to discuss and develop viable location specific strategies and (ii) formulating a pilot project for integrated coconut

development and processing including setting up of Farmers Field Schools (FFS).

4.1. Consultative group meeting of experts

The Asian and Pacific Coconut Community would like to organize a consultative group meeting of experts, representatives from tsunami affected member countries and experts from the coconut based coastal ecosystem involving UNESCAP, FAO, UNDP and ADB to discuss thoroughly and develop viable strategies for different regions.

To organize this consultative group meeting, APCC needs donor agencies' support for an amount of US\$ 60,000.

Therefore APCC looks forward donation from any donor agency/ country.

4.2. Pilot project on integrated coconut development, processing, marketing and setting up Farmers Field Schools and (FFS) in tsunami affected areas

This pilot project will be prepared after consultative group meeting as a farmer - private entrepreneurs - public (Government) partnership programme. This pilot project will be implemented in two countries of which one will be in Aceh in Indonesia and other will be identified from among the five other countries where coconut is affected more.

This project may cost about US\$ 4,000,000. The donor agency will be requested for funding as special emergency project which will go a long way to develop sustainable activities in the tsunami affected areas.

This pilot project will have the components of rehabilitation, productivity increase, pests and diseases management, farm land processing, product diversification and marketing as well as setting up of Farmers' Field Schools (FFS) as a capacity building activity.

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