Resilience, Rights and Resources: Two years of recovery In coastal zone Aceh

Nypa fruticans – useful but forgotten in mangrove reforestation programs?

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Introduction

Human population living along the coast depend on sea and rivers for fishing as well as the natural vegetation along the coast. The mangroves along the coastal zone are an important natural resource form which people derive their food, fibre and income. Two dominant mangrove types exist on the west coast of Aceh - *Rhizophora* and *Nypa fruticans*. The Rhizophora flora is dominated by *Rhizophora mucronata*, locally known as *bakau*, hence the mangrove forest is called as "Hutan Bakau".

Nypa fruticans (family Arecaceae) has a fairly wide distribution - India, Myanmar, Thailand, Malaysia, Indonesia, Borneo, Philippines, Ryukyu Islands, New Guinea, the Solomon Islands and northern Australia. *Nypa*, known as the *Attap* Palm (Singapore), *Nipa* Palm (Philippines), and Mangrove Palm or *Nipah* palm (Malaysia), is the only palm considered a mangrove. As the only species in the genus, it is, however, not a mangrove in the strict sense, as it does not exploit truly littoral environments nor can it tolerate inundation with undiluted sea-water for long periods. A critical environmental condition for *Nypa* is the percentage dilution of the sea-water by seaward flowing fresh-water. It occurs most commonly in areas of brackish water, extending upstream into permanent fresh-water areas where tidal-influenced water-level fluctuations are able to carry and deposit the seeds. *Nypa* does not require saline conditions at all as it can grow well in pure fresh-waters. However, the salt-water tides are crucial for seed dispersal and deposition of silt. *Nypa* can also grow as an undershrub, infrequently as a tree, or can dominate in mixed forest.

Figure 1. *Nypa* palm along a water way, but close to the sea

Figure 2. The trunk or stem of the *Nypa* palm is under the mud. Only the leaves project upwards

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Nypa palm has a horizontal trunk that grows beneath the ground and only the leaves and flower stalk grow upwards above the surface. It cannot be considered a tree although the leaves can extend up to 9 m (30 ft) in height. The female flowers grow at the tip of the inflorescence with catkin-like red or yellow male flowers on lower branches. The seed is woody and arranged in a cluster compressed into a ball up to 25 cm (10 in) across on a single stalk. The ripe seeds separate from the ball and are floated away on the tide, occasionally germinating while still water-borne.

Figure 3. *Nypa* fruit is football sized, rising from the mud on a stick. When ripe, the ball breaks away and breaks up into individual fruits. These float away and may even germinate as they float.

Multiple uses of *Nypa*

The long, feathery leaves of the *Nipa* are also used in many places as roof material for thatched houses. The leaves are also used in many types of basketry and thatching. The inflorescence can be tapped before it blooms to yield a sweet, edible sap collected to produce a local alcoholic beverage called Tuba. In the Philippines, Tuba is stored in Tapayan (balloon vases) for several weeks to make vinegar. Young shoots are also edible and the flower petals can be infused to make an aromatic tisane. *Attap chee* is a name for the immature fruits -sweet, translucent, gelatinous balls used as a dessert ingredient, especially during the fasting month of *Ramadhan*. In islands of Roti and Savu in Indonesian, the sap tapped from the palm is fed to pigs, allowing the pigs to fatten during the dry season when other fodder is scarce. The pigs are also fed the leftovers after sugar preparation. This is said to impart a sweet flavour to the meat. In this way, the *Nipah* Palm results in protein for the community.

The young leaves of *Nypa* are commonly used to wrap tobacco for smoking in West Aceh. Before tsunami, rolling cigarettes using young *Nypa* leaves was a major secondary livelihood activity for many households in West Aceh. Nearly 50 percent of the villagers in Cot Darat of Samatiga sub-district owned or worked in *Nypa* farms. They largely produced tobacco wrappers, roof thatches and woven products for sale.

A women's group in Cot Darat also produce cigarettes with *Nypa* leaves. Fifty kilograms of young *Nypa* leaves are harvested in a day in the morning. The leaves are then sun dried. The group makes about 75,000 sticks of cigarettes that are sold to local shops at Rp 500 per piece, which are then retailed at Rp 1000 per piece. The women's group also made coconut oil in the past, but this has stopped since the tsunami as aid agencies and many NGOs provided free coconut oil to victims of the tsunami. Likewise, in Alue Raya of Samatiga sub-district, many women were involved in *Nypa* 'industry' that are equally important to other farming activities as in certain months, the income derived from *Nypa* based activities exceeds that from other activities.

Figure 4. *Nypa* fruit – a local delicacy in Aceh

Figure 5. Rolling cigarettes using young *Nypa* leaves- a major secondary livelihood

Those involved in this small scale industry could earn up to Rupiah 2 million (US$220) from one-hectare harvest of *Nypa* leaves. This was a substantial amount of income for locals, who usually earn less than US$3 per day from primary activities like fishing or farming. The reason it's considered as a secondary economic activity in most villages is because the harvest for *Nypa* leaves are done every three months over a two to three days period. This gives time for re-growth of the *Nypa* leaves. However, a number of those who owned larger *Nypa* farms harvested the leaves on a monthly basis.

Nypa also has important soil protection function. Its horizontal creeping stem stabilises river banks preventing soil erosion. New fronds emerge quickly after damage and so quickly protect the land after disturbances and also continuously produce useful products for the locals.

Nypa fruticans before and after tsunami

Large areas of *Nypa* existed in Samatiga of Aceh Barat and Suak Bagong of Aceh Selatan, *Nypa* covered large areas. In Samatiga, over one hundred hectares (50% of pre-tsunami stock) of *Nypa* forest were totally destroyed. Many of the mangrove trees further from the coast (1-2 km) had broken tops, but showed no evidence of uprooting. Trees close to the coast were washed away by the powerful waves. The soil around these *Nypa* forests, and paddy fields located close to the coastal areas were washed away and in parts it has now became wetland or inter-tidal zone. The remaining *Nypa* areas were highly contaminated from debris, mud and in the initial stage decaying human corpse was discovered amidst the palms. All this made the users, including owners of the *Nypa* land to abandon their farms. Although *Nypa* has spurted natural re-growth in some places, local people believe it will be a very slow process. If assistance is provided in clearing the dead plants, new seeds can be planted and eventually their livelihood can be restored. Currently only the Meulaboh Crisis Center (MCC), a local NGO is providing assistance to the community in Cot Darat village to clear the debris from their *Nypa* farms or initiate harvesting activities. Other affected villages are still waiting for assistance.

The extraction and use of *Nypa* is now very limited along the west coast of West Aceh. In Samatiga, households involved in *Nypa* farming lost an average of US$73 month/hectare as a result of tsunami-related resource loss. Most were involved in producing tobacco wrappers from young *Nypa* leaves. Where it provided significant income to farmers in the *Nypa* areas in the past, this livelihood strategy has reduced significantly in the post-tsunami stage (Table 1). The story for *Rhizopora*, *Pandanus* and *Sago Palm* is similarly disheartening.

Table 1. Past and existing use pattern of the four dominant types of mangroves and mangrove supported ecosystem on the west coast of Aceh

Type of species	Uses	Subsistence and commercial use	
		Pre-tsunami	Post-tsunami
Nypa	cigarette cover	***	*
	straw brooms	***	*
	Nypa fruit	***	*
Rhizopora	fuel wood	***	-
	Charcoal	***	-
Pandanus	building material (fence, floor & boats)	***	-
Sago Palm (Rumbia)	woven product, e.g.: floor mats	***	-
	roof thatch	***	-
	sago starch	***	-

Source: World Fish Centre Report: Note 1: ***extensive use; *significantly reduced use; -absent

Major efforts are being made under the GERHAN program to rehabilitate mangrove forests along the west coast of Aceh with aims to re-plant some 2,550 ha of mangroves on the west coast, or almost 14 percent of the total forest and land rehabilitation allocation for Aceh. However, there remains a significant gap between plans for re-planting and the future use and sustainability of the rehabilitation efforts. Useful species such as the *Nypa* palm has received little, if any, attention in the government plans. Coastal forest rehabilitation is likely to be more successful and better accepted by local people if, in addition to species of only conservation value, *Nypa* and other useful species with livelihood and economic values are included.

KEY MESSAGE

- *Nypa fruticans* is an important plant species in West Aceh – for both economical and environmental functions
- Rolling cigarettes from young *Nypa* leaves – a major household income source (up to IDR 2 million or US$220 per ha).
- Technical information on *Nypa* regeneration and management is lacking
- Government mangrove rehabilitation programs have largely missed out on species like *Nypa* that have both environmental and economic benefits
- Coastal rehabilitation efforts are more likely to succeed if conservation and livelihood issues can be jointly addressed.

World Agroforestry Centre (ICRAF) is one of 15 organizations under the CGIAR (Consultative Group on International Agricultural Research) umbrella. ICRAF aims to stimulate and conduct innovative research, development and capacity building to promote and support agroforestry for both human and environmental benefits. ICRAF has its headquarters in Kenya and six regional offices in the tropics and now cover 21 countries in Africa, Asia and Latin America.
The research bulletins are summary results of collaborative activities of ICRAF and partners in the "Recovery and Resilience of Livelihood and Natural Resources", mainly in West Aceh, after the Tsunami of 26th December 2004. These bulletins were prepared, first in Indonesian language, for a workshop in Meulaboh on 30 November 2006. The primary objective was to share relevant result findings and observations among government and non-government organisations and individuals involved in the post-tsunami recovery in West Aceh. The workshop and preceding research activities were supported by Ford Foundation Indonesia, EU Asia Pro-Eco Program and CGIAR.

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