Food and Agriculture Organization of the United Nations

Illipe nut plantation on undrained peatland in Indonesia

Source	Mitigation of Climate Change in Agriculture (MICCA) Programme of FAO
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Country of first practice	Indonesia
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Sustainable Development Goals	No poverty and life on land

Summary

Illipe species (*Shorea spp.*) are Southeast Asian forest trees that are highly suitable to be cultivated on tropical peatlands. The nuts and timber of these trees have a high commercial value. At the same time illipe plantations conserve peatlands. Peatlands not only hold a large pool of carbon, but also play an important role in the retention, purification and release of water and in the mitigation of droughts and floods. Therefore a sustainable management of peat ecosystem is needed to improve the resilience and capacity of a community to adapt to climate change. This practice describes the benefits of Illipe nuts and how to establish an Illipe plantation. It is derived from a study case in West Kalimantan, Indonesia.

Description

Illipe species or *Shorea spp*. (Indonesian name: tengkawang) are southeast Asian climax forest trees and are used for nuts and timber. Illipe nuts are an important non-timber forest product with a high commercial value. The fat derived from the nuts is used as a cocoa butter equivalent, in cosmetics and for other products. The main foreign markets are in Japan, the Netherlands and the United Kingdom. The tree also produces quality timber for plywood face-veneer. Plantations with illipe species have successfully been established on peatlands in West Kalimantan, Indonesia. The area where this practice was applied is located along the Segedong River on a coastal, shallow to moderately deep peatland. The peat depth at the plantation was between 30 and 300 cm. The water table depth fluctuated from 0 to 0.5 m.

1. Establishing a illipe plantation

Shorea pinanga, *S. macrocarpa, S. stenoptera* and *S. macrophylla* are trees species that can be used. A high level of technical knowledge is needed to establish and maintain a plantation with illipe species. Key steps need to be undertaken.

- Establish a semi-shaded nursery from fruits, wildlings or vegetative propagation. The tree seedlings grow here for three years.
- The illipe trees are planted using line planting. The spacing is 3 m by 10 m with a north-south direction and the lane width (line) is 3 m. Open 3 to 5 m gaps in the forest and prepare planting holes with compost.

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- Weeding has to be done up to three years after planting.

With line planting the annual diameter increment (a parameter for tree growth) is about 1.5 cm. After seven years from the establishment, the plantation starts to fruit. The fruiting usually occurs every three to four years after a period of several rainless weeks. The total establishment cost for three years of maintenance is about USD 1 000 per ha. The costs of establishing a tree nursery are low.

2. Environmental advantages: climate change mitigation potential

- Illipe species tolerate frequent inundations and do not require drainage, thus lead to conservation of carbon stored in peat soils.
- The tree species produce additional biomass.
- Their rapid growth closes the forest canopy and reduces the high temperatures on previously sunlight-exposed peatland. This helps to increase carbon sequestration.
- The plantation helps avoiding soil losses due to erosion and provides additional income to farmers. These effects improve their resilience against natural hazards and diminish their risk exposure.

3. Validation of the practice

This practice represents the results from a joint programme of GadjahMada University and Inhutani II.

4. Further reading

- FAO. 2014. Illipe nut plantation on undrained peatland. In: Biancalani, R. and Avagyan, A (eds). Towards climate-responsible peatlands management. FAO. Rome. pp 72-75.
- FAO. 2014. Smallholder sago farming on largely undrained peatland. In: Biancalani, R. and Avagyan, A (eds). Towards climate-responsible peatlands management. FAO. Rome. pp. 68-71. URL
- Other study cases on this topic is: Cultivation of Dyera polyphylla (swamp jelutung). URL

5. Agro-ecological zones

- Tropics, warm

6. Related/associated technologies

- Peatland restoration in China: 8278.
- Sago plantations on undrained peatland in Indonesia: 8281.
- Beje aquaculture and inland fishery in tropical peatland of Indonesia: 8619.
- Rattan oil curing, bleaching and preservation, Malaysia, Philippines, Indonesia: 3884.

7. Objectives fulfilled by the project

7.1 Resource use efficiency

The technology is extreme climate resistant, produces additional biomass, improves soil quality and reduces carbon dioxide emissions.

7.2 Pro-poor technology

The technology provides an additional food source and income.

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