Food and Agriculture Organization of the United Nations

Sago plantations 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
ID and publishing year	8281 and 2015
Sustainable Development Goals	No poverty and life on land

Summary

This practice was introduced from the Moluccas islands in Indonesia by indigenous people. Sago palms require only negligible maintenance, which makes sago plantations among the most productive systems that can be operated at almost no maintenance cost. Small-scale sago cultivation without drainage results in a high sago self-propagation rate, short harvesting cycles and high starch content.

Description

1. Establishing a sago plantation

- Clear the land and prepare planting holes. It may be necessary to block canals in the peatland. Sago seedlings are inserted in the planting holes. Once sago seedlings are transplanted, they start to grow and produce clusters vegetatively. The clusters are then ready for consecutive, unlimited production cycles. 10 years are needed from planting to continuous harvesting when sago is grown on tidally influenced peatland. Most of the cost for this operation relates to labour and the transport of seedlings.
- The plantation should be weeded regularly.
- Dead leaves have to be pruned. If there are too many young sago in a single cluster, some should be removed.

Sago grows well on deep peat, even under minimal drainage and maintenance, However, when grown on tidally-influenced deep peat, sago produces less starch and takes longer to mature (more than 12 to 17 years) compared to cultivation on shallow peat, where mature trunks are produced 8 to 12 years after planting. The poor growth of sago palms on deep peat is likely caused by the lack of nutrients in the peat strata rather than a low pH-value. Drainage of peatland for log transport should be avoided. More research is needed to improve sago cultivation.

Figure 1. Sago plantation on largely undrained deep peatland in Indonesia (Karyanto 2014)

2. Products derived from sago plantations

The main product is sago flour. Sago is starch obtained from the trunk by washing the starch kernels out of the pulverized pith with water.

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About 150 to 250 kg of dry sago flour can be produced from one palm tree. The sago flour is used for many food items and chemical products. It is mainly used for sago noodle production, but it can be also used for bioethanol production and other produces (e.g. film, solvents).

3. Environmental advantages

After establishing sago plantations on slightly drained peatlands, there is no significant increase in CO_2 emissions compared to secondary forest cover. However, young sago palms require an open canopy, which increases peat temperatures and could increase CO_2 emissions in the first few years. Sago plantations produce much less biomass than secondary peat swamp forest. Cultivating sago increases the resilience and capacity of a community to adapt to climate change. Also the water quality is increases.

4. Validation of the practice

Plantations with sago have successfully been established on peatlands in Riau Province, Indonesia. The peatlands of the plantations had a peat depth of over 300 cm, a water table depth between 0 to 0.5 m and no artificial channels. The peatland was a fen receiving water both from groundwater and rainfall. The pH of water was acidic.

5. Further reading

- 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

6. Agro-ecological zones

- Tropics, warm

7. Related/associated technologies

- Beje aquaculture and inland fishery in tropical peatland of Indonesia: 8619
- Illipe nut plantation on undrained peatland in Indonesia: 8284
- Rattan oil curing, bleaching and preservation, Malaysia, Philippines, Indonesia: 3884
- Peatland restoration in China: 8278

8. Objectives fulfilled by the project

8.1 Resource use efficiency

Small-scale sago cultivation without drainage results in a high sago self-propagation rate, short harvesting cycles and high starch content.

8.2 Pro-poor technology

The technology is low maintenance, which makes it among the most productive plantation systems that can be operated at almost no maintenance cost.

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