

## INTRODUCTION TO PILOT PLANT OF SAGO PALM PROCESSING IN CIAMPEA, BOGOR

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Generally palm sago trees grow in low land plain area until 700 M above the sea level, while we can only get the best sago product on the area up to 400 M above the sea level. The good environment condition for sago is the swamp area, fresh water, around the stream area and damp low-land plain, muddy ground and the tannic acid area.

Generally sago trees grow naturally it can be harvested after 12 years. The sago flour product is different according to the types environment and harvesting time. In Indonesia the sago plant without thorn grow and spread in the Western part, while the thorn ones spread over in the Eastern area. These plants grow uncultivated and the breeding of sago are still done relatively simple compare to the breeding of other plants. The efforts of breeding sago plants has been done by the local (peoples) by planting the new shoots in one bush or cleaning the bush around them minimally, so that easily can be harvested. According our observation, the mechanization of cultivating sago palm, fertilizing and the insecticide, land-processing and other modern breeding activities for the sago palm have not been known.

Generally the sago farmers know that there are certain sago trees which will produce more starch compar to the other one. It depends on varity. In the frame work of research and application of sago plant breeding technology which the product can be used to produce and develop this sago forest to become a better sago palm plantation which can give the extra earning for the farmers. BPPT had developed pilot plant of the sago palm processing at Ciampea Bogor which purpose are :

- To apply the characteristic of the sago plants, so it can develop.  
The breeding technic and management. Observation and research.
- Botany, genetic, ecology.
- Breeding technics, since the seedling, land/media for development and production, water requirement, fertilizer, plant space, desease, system and the age of harvesting, the rotation until it can be applied on the field.

This pilot plant has a unit for extraction of sago palm, or a unit for the processing of sago trunk to the dry flour to ready staple food, nutritive and last long. Deside, it is planned to develop the research of utilization of sago palm as renewable sources of biomas energy, according to the technology development, so it can raise the economic value of the sago palm, which is expected to be able to support the sago palm industry and other activities.

The extraction technology to become flour or cristal sago by using some equipment according to each phase such as "grater machine, extractor, separator and dryer". For the time being weed a research the sago flour processing to become ordinary food and nourish such as; biscuit, by using equipment; mixer, moulding and oven. Sago palm pilot project is furnished by some laboratories, which will carry out the laboratory research and quality control of the product and often research of sago starch utilization as non food product, such as extender for plywood glue.

To support the operation of the pilot plant production there is a workshop for maintenance, repair and develop the design of the equipment which are use for extracting the sago starch.

This Pilot Plant has used the product capacity of 1000 kg/day of flour and sago cristal. Estimated requirement of sago trees are gathered from surrounding area, such as Sukabumi, Bogor, Lebak and Pandeglang. According to the survey which was held, Pandeglang has the largest area of sago plant and the highest quantity of the plants, eventhough the product is still low. It's caused by among others that there's no effort of looking after the sago forest. But the 4 regions mentioned above show the condition which is expected to be develop, and also supported by the local people by planting the new shoots on the area which are not suitable for planting paddy and the area which are sensitive for the erosion.

As the source of carbohydrat, the sago flour has the important role as the staple food in Eastern part of Indonesia, in this case sago can be cooked as the tradisional consumption for example; papeda.

Beside staple food, sago also used as the snack food such as; bagea, lempeng sago and sinoli (local name of food in Maluku). This flour doesn't contain enough protein, so the food which are made of this flour will need addition protein from milk powder or soybean powder to preserve the food, cheap and nutritive, so it can be accepted by society in the frame of using sago as food version, that is making biscuit.

Some food are made of this flour, at large has been accepted by the society by using sago as the basic material, as the substitute or as the mixture. Some types of food which are made of cassava/tapioca can be substitute by sago. Noodles made of flour or rice can also be substitute or mixed with sago, "as well as" same traditional food and other cookies.

For the time being the sago flour as the product of pilot plant are sold in the market to the consumer to make the snack such as cendol, cookies or sold to the home industries as the substitute of other flour; crackers and noodles industries.

The construction of pilot plant actually has the aim for applying the technology of sago processing until it can be used as the tools to increase skill of operators and training in research, such as;

- To change sago from the food with low economic value to the new form with high economic value.
- To use the sago plant waste.
- To change the agronomy habit of cutting to preserve the sago forest.

Also in this occasion we also invite JICA to participate in our program to study and apply the starch chemistry, such as; in making capsules, plastic and renewable energy which at present has not been handled yet.