Taro Production in the Philippines – Its Prospects and Problems[1]

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Abstract

Taro ranks third in production and hectarage among root crops grown in the Philippines. The paper however, shows that a considerable increase in the overall production has taken place from 1975-1977.

Problem areas on taro variety planted, cultivation, pests, etc. are identified. Potenials of taro for food, animal feed and industrial uses are also discussed.

Introduction

The tropical condition in the Philippines gives forth luxuriant growth of plants. Among the predominant food crops in the country are root and tuber crops found in forests, swamps and other moist laden areas. Species of *Alocasia, Cyrtosperma* and *Colocasia* abound in swamps, canals and river banks. Domestication has brought these plants in the surrounding canals of the household which supposedly triggered their consequent agricultural development.

Unlike other crops which have been kept abreast with more modern and scientific technology, *Colocasia* and its group of species remain a "Cinderella" to rural folks. Locally known as "gabi," it can be grown throughout the year in a wide range of soils. It is a crop the household could turn to whenever shortage of traditional vegetable crops and carbohydrate food arises. It is considered one the more expensive and rare vegetables in the market particularly in the metropolitan areas. Only their by-products unfit for human consumption go to feeds but never to waste.

Present Uses

A. **Food.** Taro is generally grown as a backyard crop and is most often planted in tracts of land no greater than a few hundred square meters. However, there are some areas in the Bicol region, Negros Oriental and Cavite where the crop is cultivated in commercial scale although the individual farmholdings are still less than one hectare.

1. Vegetable. The entire plant is utilized as food depending on the variety. In the Bicol Region and in Eastern Visayas, the leaves and petioles are just as

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important, if not more important, than the corms for vegetable. There are varieties specifically grown for the leaves and petioles, for corms, and for both.

2. Staple and snack food. The boiled corms serve as substitute staple to many families particularly those living in the hinterlands where growing rice is less feasible. Likewise, they are served as snack item in form of boiled whole corm, fried chips, confections and other preparations.
3. Other Food Uses. Taro flour has been reportedly used for special baked products, beverages, baby food and others. However, they have not reached commercial level in the Philippines.

B. **Feed.** The use of farm by-products from taro harvests for animal feed is a common practice in the rural areas. The leaves, petioles and peelings are normally chopped, cooked and fed directly to hogs. Feeding the corms to hogs is generally limited to overmature, damaged and unmarketable ones not suitable for food.

Production

Taro production in the Philippines is still low compared to sweet potato and cassava that the crop has been classified under "other" roots, bulbs and tubers. It ranks far third in production and hectarage among the root crops grown in the Philippines (Table 1). This is rather unfortunate considering the nutritional value and market potential of this crop. Nevertheless, recent survey shows that a considerable increase in the overall production has taken place from 1975 to 1977 (Table 2).

In 1977, the area devoted to taro increased by 8,332.09 hectares over 1975 with a corresponding increase in production of 22,851.79 metric tons. The largest areas planted to taro are located in the Eastern and Central Visayas and in the whole Mindanao region. From 1975 to 1977, there were abrupt increases in hectarage in Eastern Visayas and Western Mindanao.

Production Practices

Taro is cultivated under paddy and dryland and under conditions intermediate between paddy and dryland cultures. The practice vary from region to region and often also from farm to farm within a region.

A. **Upland or dry culture.** Upland or dry culture is the predominant practice in the Philippines. The crop is grown mostly in backyards usually along the bank of drainage canals or in small plots with adequate supply of water. In this case, land preparation is minimal and usually done with the aid of hand tools.

Gabi farmers usually employ two methods of planting depending on the variety. In Eastern Visayas, a hole or "gahong" is made and the sett is simply slipped into it. The hole is only partially covered with soil leaving a hallow around the plant. Innovative farmers fill the holes with mulching materials which decompose after a short period. The holes are dug to about 20-25 cm deep and after placing the sett, the hole is covered leaving the top 10-15 cm unfilled. In other places, the sett is simply buried at least deep enough to cover the basal portion or about 3 cm above the highest collar ring.

In commercial plantings, taro is often grown as intercrop among coffee, cacao, coconut and fruit trees. There has been no incidence of serious insect pests and diseases in the field that necessitates regular application of insecticides or fungicides. For commercial production, the average farm size is .5-.8 hectare. The land is prepared in the same manner as for other upland crops. The setts are hand planted in cut furrows by

using a small trowel or machete at an average spacing of 50 x 75 cm. Mulching is done to suppress weed growth and conserve soil moisture. An alternate hilling-up and off-barring operation is sufficient to control most of the weeds. The last cultivation is usually a hilling-up process. Weed control is critical during the first four months of growth until 100% cover is achieved. Fertilizer application is seldom practiced for upland culture but irrigation is a must during prolonged dry weather.

B. **Lowland or Wet Culture.** This system of growing taro is not popular in the Philippines because, generally, farmers grow rice in their paddies. However, in regions where culinary demand for taro is high like in the Bicol Region, lowland culture of gabi is commonly practiced. Land preparation is essentially similar as in preparing a rice paddy field. Planting maybe done immediately after land preparation if the setts are planted on flat beds. In some areas, beds are formed where the setts are planted so that the developing plants are not under submerged condition. For the initial planting, raised beds approximately .5 to 1 m or more in width, with 50-75 cm space between beds, and elevated at about 10-15 cm above the normal soil level, are formed after the soil has settled following the final puddling. The beds are usually allowed to settle for a day or two before planting. Planting is done by hand at a depth of 7.5-10 cm at an average planting distance of 50 x 50 cm or 75 x 50 cm. Succeeding plantings are done on the beds with minimal cultivation for as long as the beds exist, otherwise the field is re-plowed, borrowed and new beds are formed again. Cultivation is not normally done under lowland culture. However, weeding is most critical during the first two months after planting. Irrigation practices vary among farmers and this is usually dictated by the availability of water. Some farmers keep the field flooded to a maximum of 8 to 10 cm as soon as the first leaves out. The water may be kept continuously flowing at this depth or water maybe withdrawn intermittently. Other farmers keep the water to the minimum just enough to maintain soil or field saturation. In raised bed method of culture under paddy condition, water is maintained in spaces between the beds so that the beds are kept under saturated condition constantly.

Harvesting and Marketing

Crop duration differ widely with localities and varieties. As a general rule, upland taro undergo faster rate of development than lowland taro even if the same variety is used. Upland gabi matures in 5 to 10 months in the Philippines. Dasheen type of *Colocasia* matures in 5 to 8 months. Lowland taro matures in 9 to 12 months or 7 months at the earliest.

Harvesting of gabi is generally done manually. Corms and cormels are prepared for the market by removing the adhering soil particles and fibrous roots, and by cutting the petioles leaving the basal 20-25 cm intact with the tubers. The corms and cormels are sorted before being placed in suitable containers for transit.

Taro is marketed in different forms. They are tied in bundles and young rhizomes or runners and the young leaves together with their petioles are relished as green vegetables sold in open market.

Potentials

A. **Food.** The potential for expansion of taro production for food in the Philippines is still great. Present production cannot meet the entire requirement particularly in cities and metropolitan areas. This is because the present systems of production and marketing do not fit the requirement patterns. Food uses can be expanded further if utilization is based on processed tubers avoiding the direct use of fresh tubers. This will allow more efficient marketing and shipment of taro products to distant places even for

longer periods.

B. **Feed.** The prospect of expanding the utilization of taro for animal feed is even greater than for food. Gerpacio (personal communication has conducted studies using *Xanthosoma* corms for poultry feed. The Visayas State College of Agriculture has ongoing studies on the use of *Xanthosoma* for hog feed using preparation techniques suitable at the farm level.

C. **Industrial Uses.** The use of taro flour or starch commercially in the Philippines has not been reported outside the laboratory. The discovery of the special use of taro starch in the manufacture of biodegradable plastics has opened another venue for industrial use of taro. This is perhaps the best prospect of taro to become an export crop of this country.

Problems

A. **Agronomic Problems**

1. **Variety.** Early results of varietal evaluation studies indicate that most if not all Philippine varieties are low yielding and unresponsive to fertilization (Table 3 and Fig. 1). This can be due to any or all of the following:
   a) No research had been done on the selection of high yielding cultivars until very recently.
   b) farmers have put greater emphasis on quality rather than on yield of corms alone.
   c) there is equal utilization of plant parts in the main taro producing areas of the Philippines.
   d) Philippine varieties in general are rhizome forming rather than sucker forming.

Consequently, one of the main projects of the Philippine Root Crop Research and Training Center is devoted to the collection and evaluation of taro germplasm. Indigenous germplasm is being enriched with introductions from Hawaii.

2. **Cultivation.** Production of taro in commercial scale varies in different regions. It is not known which system is more appropriate suggesting a need for an evaluation of production methods. Currently, development of management techniques under dryland and paddy conditions is in progress. While production under paddy condition has resulted in tremendous yields in other countries like in the USA (Hawaii), this has not been duplicated so far in the Philippines. In the long run, dryland culture maybe more relevant under Philippiné condition because the paddies are usually planted to the more valued staple rice.

   Most of the taro produced in the country is grown as intercrop except in some commercial areas in the Bicol region. Efficient production systems have to be developed which can respond to any immediate increase in demand.

3. **Pests.** The most common insects attacking taro in the Philippines are horned-tail caterpillar, cutworm and grasshoppers. Nevertheless, these insects have not been observed to cause serious damage in the field.

   Diseases are more damaging than insects. The tuber rot caused by *Phytophthora colocasiae* is the most dredded disease of taro in the country. Trials conducted at the Center, showed that continuous taro cropping on the same farm increases damage after 3 years of cropping under dryland condition.

   Leaf blight is commonly observed during the rainy season. Mosaic

virus has been observed occasionally but its economic importance is not known.

4. **Socio-economics.** Marketing of taro is generally limited to the area of production and its vicinity. This is primarily due to the bulk of fresh tubers and their susceptibility to rough handling. Therefore, to improve its marketing potential, the tubers have to be processed to get rid of its high moisture and increase its storage period.
5. **Utilization.** Expansion of utilization of fresh tubers for food has a limited ceiling. Greater expansion can be expected for feed and for industrial uses. Unfortunately, technologies for feed and industrial uses are not yet developed at this stage.

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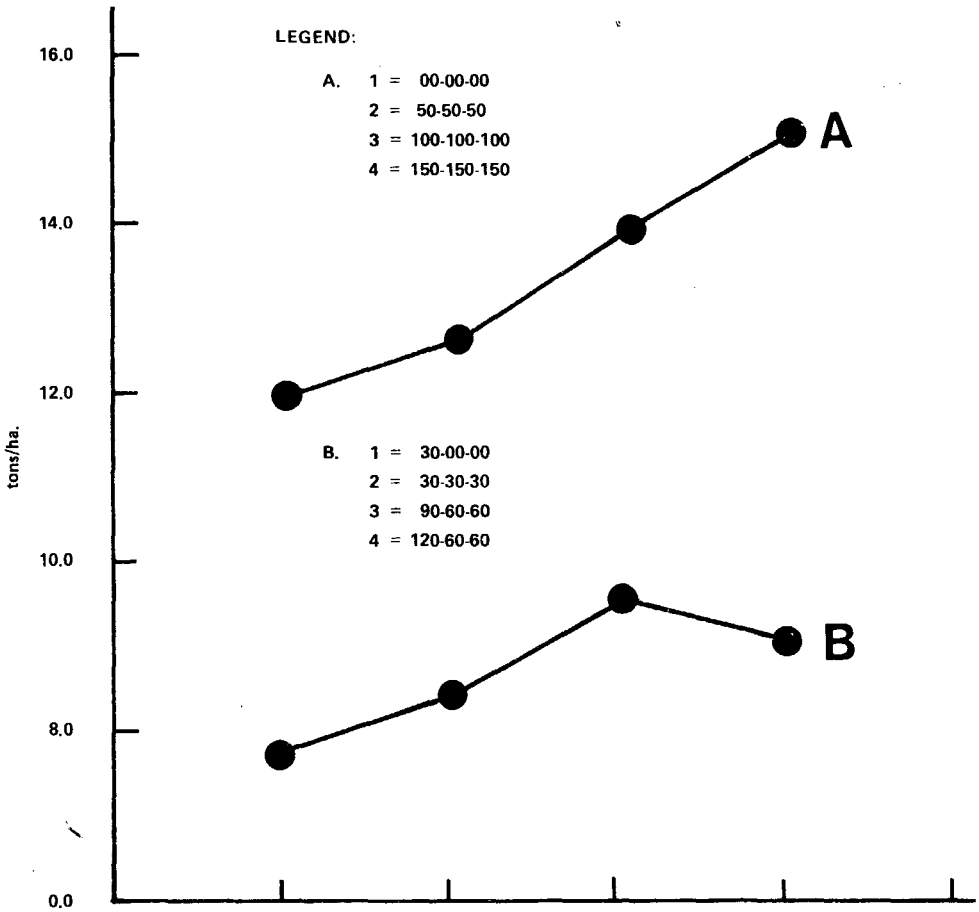

Figure 1 Main corn yield of gabi (Kalpao) under different fertilizer levels.

Table 1. Root Crops: Area, Quantity and Value of Production, Philippines, CY 1977.

Root Crop	Area (ha.)	Quantity (M.T.)	Value (Peso)
Sweet Potato	221,730	887,748.0	418,464.400
Cassava	154,270	987,791.0	368,878,100
Taro	36,830	123,522.7	55,760,600
Pao (Galiang)	4,080	18,224.8	13,656,700
Tugui	1,130	4,135.3	4,443.200
Ubi	8,230	26,621.2	37,041.300
Total	426,270	2,048,043	898,244,300

Source: Bureau of Agricultural Economics, Ministry of Agriculture, Quezon City.

Table 2. **Area production for taro, Philippines, 1975 and 1977.***

Region	Area (ha)		Production (mt)	
	1975	1977	1975	1977
Ilocos Region	470	424.00	3,353.2	3,124.60
Cagayan Valley	370	611.00	1,175.6	1,965.53
Central Luzon	360	598.00	2,595.6	2,975.95
Southern Tagalog	1,270	1,183.00	7,310.9	3,864.16
Bicol Region	2,570	2,030.00	12,869.4	10,561.62
Western Visayas	340	396.66	1,419.8	2,493.93
Central Visayas	8,060	8,397.00	18,014.5	11,975.10
Eastern Visayas	7,530	11,254.33	23,197.1	22,911.29
Western Visayas	5 30	4,882.30	1,527.5	37,911.85
Western Mindanao	3,400	2,225.00	13,157.3	7,696.50
Southern Mindanao	1,070	2,300.80	8,086.4	9,797.56
Central Mindao	–	309.00	–	642.80
PHILIPPINES	25,970	34,611.09	92,706.3	116,200.89

*Sources: The Philippine Recommends for Gabi 1977. PCARR. Agro-Economic Studies of Root Crops in the Philippines, Progress Report, 1977. PCARR Project 475. PRCRTC. Baybay, Leyte, Philippines.

Table 3. Average yield of promising taro varieties, PRCRTC, 1979.

Accession No.	Corm Yield mt/ha
G–337	10.57 t/ha
G – 198	13.78 t/ha
G – 083	12.84 t/ha
G – 068	15.70 t/ha
G – 078	14.67 t/ha
G – 097	13.69 t/ha
G – 318	11.67 t/ha