

The island of Guimaras in the Philippines: A brief agro-economic survey.

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Summary

Further to a visit in the Philippines and in the island of Guimaras from April 8 to May 8, 1985, this document briefly presents the general environment of the Philippines and describes the agro-economic activities of Guimaras in more details. It finally suggests some recommendations with a view to complete or to make efficient the numerous actions on hand in the island.

Résumé

Suite à un séjour aux Philippines et dans l'île de Guimaras du 8 avril au 8 mai 1985, ce document décrit sommairement l'environnement philippin et décrit plus en détail les activités agro-économiques de l'île de Guimaras. Quelques recommandations sont suggérées afin de compléter ou rendre plus efficaces les nombreuses activités en cours dans l'île.

Introduction

The main official information on the island has been taken out of the document entitled: "Provincial multi-year development plan 1985-1989. Subprovince of Guimaras. Prepared by Provincial Planning and Development Office in coordination with N.E.D.A. Regional Office VI, Iloilo City". This work gathers many pieces of information but, like all the agro-economic statistics available, they are often incomplete and even conflicting. Only the most likely of them have been kept for this note after discussion with some administrative leaders on the field.

General presentation of the Philippines

The Philippines are located in Asia, between latitude 4°10' and 21°10' North and between longitude 116°55' and 126°36' East. The 1982 estimated population is about 49.5 million inhabitants spread on 29.9 million ha land, that is to say a population density of 162 inh./km². The national territory is made up of 72 provinces distributed into 12 administrative regions. The Philippines number 7,107 islands: insularity thus determines the climate and the inhabitants' mentality.

The land topography is mainly hilly: the mount Apo is 2,954 m high. Some areas are volcanic, some volcanoes being still in activity (volcano Mayon). The climate is warm and humid, tropical or even equatorial like, with an average of 27°C and 2,500 mm rainfall during the year. The geographic and altitudinal scattering causes substantial disparities in climate between North and South, East and West: from 1,100 mm rain a day in Baguio in the

North to 1,000 mm rain a year in the shielded valley of Cagayan in the South of the country. There is an increasing gradient of the monsoon and typhoon regimes from the South to the North. Some years, typhoons hit part or all of the archipelago very hardly.

If the vegetation is still very diversified (more than 10,000 classified species), the fauna has grown poorer in the course of the centuries. The marine animal life, on the contrary, is rich and varied.

The Philippines' history is marked by the Spanish and afterwards by the American colonization. Today the U.S. influence is still felt strongly everywhere in the country. The population is made up at 70 % by farmers and has a high annual growth rate of 3 %. The tertiary sector is hypertrophied and dominated by a powerful land or business oligarchy. Small farmers are, therefore, numerous.

In 1980 the gross national income per capita was 500 U.S. dollars, which ranks the Philippines amongst the most favored third world countries.

Foodcrops are dominated by rice. Irrigated rice allows up to three harvests a year, while upland rice ("dry rice") allows only one. The International Rice Research Institute (I.R.R.I.), created in the Philippines in 1960, has significantly increased the yield and has improved the rice cultivation practices. Other main foodcrops are banana, beans and other similar grains, maize, cassava, sweet potato and vegetables (see table 1).

Cashcrops are represented by sugar-cane, coconut (first exporter of coprah in the world), mango, Manila hemp, tobacco and again banana. Other tropical

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TABLE 1.
Area, production and yield of principal crops in the Philippines 1948-52, 1963-65, 1974-76 and 1983 (annual averages)

	Area (1000 ha)				Production (1000 T)				Yield (kg/ha)			
	1948-52	1963-65	1974-76	1983	1948-52	1963-65	1974-76	1983	1948-52	1963-65	1974-76	1983
Rice	2350	3132	3555	3300	2767	3969	6092	8150	1180	1270	1713	2470
Maize	969	1976	3213	3400	696	1329	2726	3385	720	680	848	996
Cassava	49	92	118	210	290	619	815	2300	5900	6700	6911	10952
Sweet potatoes	113	148	198	210	465	737	910	1050	4100	5000	4595	5000
Dry beans	58	62	54	55	36	30	33	38	630	490	609	691
Cabbages	3	5	8	8	25	35	52	75	8500	7500	6621	9146
Tomatoes	10	16	16	16	29	58	135	145	3000	3600	8496	9063
Sugar cane	159	303	509	480	7396	15341	22230	21467	46400	50900	43713	44723
Bananas	122	216	—	—	462	708	1731	4200	10500	12500	—	—
Groundnuts	27	24	51	55	19	14	33	50	720	560	648	909
Coconuts	—	—	—	—	4453	7121	8907	9200	—	—	—	—
Coffee	10	42	69	130	4	39	75	160	—	—	1088	1231
Tobacco	36	89	86	55	21	60	67	73	600	660	695	818

Source: FAO, Production Yearbook, 1968 and 1983.

The sugar-cane production tripled within 30 years. Coconut and rice also increased in quantity during the same period. Banana, maize and cassava increased thanks to the extension of the farming areas and to specific programmes (e.g. maize and cassava). The remaining plants are less vital and only beans and the other similar grains, like peas, show a stagnation at national level.

fruits, such as pineapple, coffee and citrus, are mainly consumed on the spot and are exported only in small quantities. Table 1 represents the national data evolution for surface, production and yield of the main crops.

The Philippines' livestock is well-represented by the water buffalo called "carabao" mainly used for haulage (in rice-plantations and for transportation). The other bovines are issued from a interbreeding with zebu cattle. Pigs are appreciated as food everywhere in the archipelago except in the South-east because of the predominance of the muslim religion. Goats, sheep and poultry (chickens, geese and ducks) are also to be found. Fighting cocks are grown everywhere in the country-side. The local milk is not consumed at all (taste and hygiene), it is substituted by imported milk! Beef is also imported in large quantities for the national production is insufficient. Fishing (in the open sea, along the coasts and in fishponds) is still underexploited for lack of modern equipment and for lack of knowledge on biological environment of the species to grow.

Water pollution is a problem that, within a few years, will destroy the country's marine animal potential (the pollution in the Bay of Manila is a good and actual example).

The scientific agricultural research is managed by an overcrowded administration and divided into a countless number of organizations linked together or not. The coordination of these organisations is muddled in status subtleties that make a quick and efficient action unlikely. There is a discrepancy between the wishes from the research's highest level and what happens on the field. Like everywhere there are exceptions but, unfortunately, they confirm the rule.

The island of Guimaras

Guimaras is an island in the province of Iliolo that itself, together with other provinces, belongs to the sixth of the 12 administrative regions of the Philippines. This region is called West Visayas Region. The island, small archipelago in herself, is 41 km long and 20 km wide, has a 60,465 ha surface for a population of 92,380 inhabitants in 1980 (estimate for 1985: 104,058 inh.). The island is divided into three municipalities: Jordan with the island's capital San Miguel, Bueanavista in the North and Nueva Valencia in the South.

Municipalities are divided into 96 villages. The chief of each village is the smallest administrative leader. A little more than 94% of the island's population is rural and lives from agriculture and livestock. Schematically, the island consists of large farming zones: gold lime (*Citrus mitis Blanco*, called Kalamantsi) in the North, rice and cashew nuts in the centre and mango and coconut in the South. In fact, each farmer tries to cultivate each of these plants, but concentrations of these cultivations exist in varying proportions on the island. These plants, except rice, are exported from the island, which brings an income to the inhabitants, as the sale of fishing and breeding products. Climate is made up of 2 distinct seasons: one is dry from November to April and the other is rainy from May to October. The latter is influenced by the South-east monsoon and sometimes by typhoons.

Rainfall distribution is different over the island: drought comes sooner in the South than in the North; this leads to a change in the distribution of the main cultivation zones. Mango can be harvested in

the South in November or December, because flower induction can be undertaken already in August thanks to the drought, when it is still raining in the center and in the North of the island and the product used for flower induction is rinsed off by the last rainfalls.

The main climatic data available for Guimaras in 1981-1982 are: temperature in °C: 26,4; % of relative humidity: 89,7; rain height in mm: 2437 (the rainfall average over 21 years at the airport of Iloilo, located in front of the island, is 1981 mm).

The highest point of the island does not even reach 300 m and, besides small coast plains, there are no large plateaus, as the whole island is hilly or rolling.

More than 60 % of the soil has a slope over 8 % which makes mechanization rather unsuitable for the modernization of agriculture. This explains the presence of water buffaloes everywhere on the island. A programme for an improved exploitation of the water buffalo is desirable, as well for haulage as for transportation: one can often see a buffalo pulling a shaft (without wheels). There are many implements adapted to animal traction that could be extended.

Soil occupation statistics are not reliable, for they vary from one document to the other and none of them specified whether the relevant surface is cultivated with one or several plants, over one or several seasons. There is a data cross-check for rice (6,296 ha irrigated and rainfed), coconut (11,299 ha) and mango (162,262 trees). The rest of the land is occupied by fallows, formerly covered by forests (8,212 ha), by fish-ponds (3,512 ha), by salt marshes (10 ha) and finally, by urbanization (353 ha). White sandy beaches are also covered by coconut palms... often together with other plants such as jackfruit or other fruit-trees, food crops or simply grass to allow cattle to graze near the habitation place.

Thirty percent of the farmers own their lands: there are many small landowners, but there are also wide domains (one of them covers more than 1,000 ha). Consequently, 70 % of the farmers are only tenants. This occurs in a very simple tenure system. Big landlords exploit part of their land themselves and then plant orchards (mango and coconut) on the rest of the land. They hire plots from the latter to farmers without land. This happens in 2 different ways. In the first, the farmers exploit the land and pay nothing neither in nature nor in money (speculation aims of the landowner who expects to sell a valorized land). In the second, tenants pay the hiring (the landlord aims at profitability) in the usual way or in nature (generally with rice and part of the fruit harvest) or both ways. Small landowners manage their plots themselves and sometimes have to rent additional land when their plots are too small for their needs. Finally, farmers without land have no choice: they have to rent a plot from the landlords.

All the nuances exist in the relationship between landlords and tenants. The land tenure system in Guimaras does not seem to be unduly unfavorable to small farmers, as they accept this situation without discussion, which is not the case in countries where usury and other abuses in tenure exist. An agrarian reform has been undertaken but for rice and maize soils only, without taking orchards and other soil utilization into account.

The industrialization of the island began with the making of hulls for the small motor boats (pump-boats) that join Guimaras to the other islands. Besides these small factories, there are two limestone factories (70 % of the production is exported, the rest is used in the national sugar-refineries), three or four rice-mills, some cashew nut roasting units and six cement block factories. A local co-operative tempts to industrialize the transformation of mangoes into dry mangoes, juice, vinegar and jam. Guimaras is proud to have the largest sugar storing unit in Southern Asia (in bulk and molasses). This sugar comes from the surrounding islands (Negros) and thanks to Guimaras' seaport, it can be loaded on big ships for export (China, URSS, etc.).

Guimaras' natural resources, besides agricultural or zootechnical resources, are not numerous, but could become important for the island if their exploitation is justified and decided. For instance, the mineral potential and its exploitation plan have not been set up in detail yet. From the touristic point of view, one has to admit, if possibilities do exist, that Guimaras is far from the organized tours of the Philippines and that site arranging would be very expensive as well for their realization as for their maintenance.

Guimaras' balance of assets and liabilities has been positive for several years. The local administration has required and obtained its independence towards the mother province Iloilo. Thus, Guimaras has become an independent sub-province, what is rather seldom in the Philippines.

Guimaras' farming system

After a one-month visit in the Philippines (two weeks in Guimaras), it is possible to describe the island's traditional farming system in its main lines, without being able, however, to work out all the system parameters or components by the way of an investigation.

The farm average size is 5.9 persons and 1.9 ha and all agriculture activities pivot upon rice (food priority). They are completed by cottage crops, fruit and cash crops, cattle rearing and fishing. These activities of minor importance are carried out in different proportions from one place of the island to the other. Extra-agricultural incomes (tertiary sector, services, etc.) are not generalized to all families.

Irrigated and rainfed **rice** covers 6,296 ha, produces 13,368 T and has an average yield of 2,124 kg/ha in 1982. Rice-plantations are harmoniously spread according to population and one may estimate that the production is entirely consumed in the island, even if there are small exports some years. Rice, and also other foodstuffs, are often bartered. Today the price of imported rice is lower than the one of local rice. If reason wanted to stop the local rice production and substitute it by imported rice, the farmers' instinct to produce themselves their basic food, even at higher prices, would never allow this substitution. Rice is consumed in the form of long-grain, creole and glutinous rice. There are several rice-mills, but none of them reaches the industrial level. The results of the research provided by the IRRI in Los Banos are not well-extended in Guimaras and only part of the research will be undertaken on the island.

The results of the regional rice development programme should be better extended in Guimaras. This programme tries to introduce two rice harvests a year wherever it is possible, thanks to a better water control, the use of high yield varieties and the use of early maturing varieties. This programme, called Kabsaka, also aims at fighting against the weeds of the rice, a major problem in Guimaras.

Maize, according to the official programme for maize, called Maisagana, covers 4,031 ha, produces 2,032 T and has a yield of 504 kg/ha in 1982. Like everywhere, maize is consumed in the form of milky grain, of flour or roasted. As for rice, the whole production is meant to be used for the local consumption. The research aims at increasing the yield in the multi-cropping system in use on the island. One of the authorities will be to substitute sweet potato for maize in the food, what would also give new opportunities to the use of maize in cattle-rearing.

Mango is a plant for which it is difficult to determine the plantation area, as the plantation density varies from 12 to 20 metres and more. This means a planted area ranging from 2,000 to 7,000 ha. The total mango production amounts to 6,245 T and the value of the sold mangoes is estimated at 10,408,332 pesos (1 peso = \pm 3.5 FB or 100 pesos = \pm 5.6 US dollars in 1985).

TABLE 2.
The situation of the mango in Guimaras in 1982.

Municipalities	Number of trees						Production	
	bear.	%	n. bear	%	total	%	in T	%
Jordan (center)	63747	58	33257	63	97004	60	1748	28
N. Val. (south)	26328	24	6857	13	33185	20	3434	55
Buena. (north)	19257	18	12816	24	32073	20	1063	17
Total (island)	109332	100	52930	100	162262	100	6245	100

Source: Provincial multi-year development plan 1985-1989

Nueva Valencia (South) has 20% of the island's mango trees that produces 55% of the island's production. This place has the highest proportion of bearing trees (79% against 66% in Jordan and 60% in Buenavista). Jordan has the highest number of trees, but they belong to big landowners, who have large orchards with lower plantation density, so that it is more difficult to take care of the trees and to carry out flower induction than in smaller orchards. The flower induction technique is recommended by the local authorities. The main part of the mango production is brought onto the market at a time when prices are low (less than 4 pesos/kg in 1985). Indeed, the mango of Guimaras is competed at that time by the one produced on other islands (Cebu, Panay, Luzon, etc.). Now, between December and February, there is a market (e.g. Manila) where the price is higher than 12 pesos/kg in 1985. The quality of Guimaras' mangoes satisfies this market at that time, as well as the market of Japan, Singapore and Hong Kong. Thanks to the flower induction during the month of August, it is possible to postpone the main part of the production to December-February and take advantage of higher prices. The flower induction brings about problems (product availability, product concentration, defoliation, additional fertilizer need, etc.) and it is in Nueva Valencia that the official proposals were accepted best. Climate conditions are more favourable in the South of the island than in the centre or in the North where it may still rain in August. These late rains then rinse off the product (potassium nitrate) used on the trees. In 1985, Guimaras' mango co-operative has sold the fresh fruit as long as it was above 4 pesos/kg. Below this price, they processed mangoes into fresh juice, dry mangoes, vinegar and jam (the last 2 products are produced in smaller quantities because of the lack of market). Processing has been tempted for other fruits, such as pineapple, papaya and citrus, but pineapples only hold the co-operative's attention and even less than the mango (no prospect for new markets).

The yield of the mango can be improved on the island: a 2.4 T/ha average now to the 8.7 T/ha national average! According to the estimations, the number of trees required for an average family who lives only on mango cultivation ranges between 0.5 and 4 ha. On the island, it seems that people admit that an average family could live above its present standard of living with only one hectare of mangoes cultivated together with other foodcrops in multi-cropping farming, provided that this family carries out flower induction, uses fertilizers and ensures a good disease protection to the trees in order to increase the yield. To make possible the distribution of a one-hectare orchard (mango-farm) to a large number of families, the land re-allocation, being now carried out on rice and maize land, should be extended to mango orchards.

The research has to see to the improvement of the economic situation of the mango: better control of the flower induction (high rate of defoliation), better disease protection (anthracnose), increase of production for export (in 1984, a survey showed that only 21 % of a mango sample corresponded to the Japanese import norms) and better adaptation of the advices extended to the local farmers' mentality. Moreover, the creation of a single sale unit for mangoes would be favourable to small producers, as the present basket contains between 40 and more than 100 kg. Industrial sun drying would allow the co-operative to save heating wood or fuel. Fruit grading units would allow each family to valorize its production at best.

In 1982, **coconut** covered 11,300 ha and produced 2,436 T. It is rather difficult to estimate the yield in nuts, for all the trees do not bear and, like mango-trees, they are planted in various density. Moreover, all bearing trees do not produce nuts: islanders like fresh coconut juice, obtained by incising the top of the flower bud, what hinders the growing of the nuts. This coco juice (not to confuse with coconut milk) is served when slightly fermenting and drunk in family or with neighbours. The sale of coconuts is estimated at 974,436 pesos.

Coconut fields allow multi-cropping at two levels: the first for plants from 3 to 6 meters high (cashew nut, coffee, jack-fruit, citrus, banana) and the other for fodder plants or food crops (cassava, maize, rice, beans, peanuts). All coconut fields are not cultivated with a dense multicropping system, but they all look like larders. There are more expansion possibilities for coconut palms than for mango trees. The use of this plant is varied and well-integrated in country life: on the one hand, the alimentary use (fresh or rasped coconut, coco milk used as a drink or in cooking for various dishes, fresh coco juice) and on the other hand, the domestic and commercial use: dried coconut (coprah; the use of a solar dryer in each family would give rapidity and regularity to its production); the trunk is used in carpentry or transformed into charcoal; the fibres and the hulls of the nuts are used in domestic works; the leaves are used to construct the roofs, walls and in esparto cottage factories, etc. The research could support the development of some of these products on the island: coco oil-cakes are used in animal feeding in other countries, and they could also be adapted to Guimaras' specific needs (bovines, pigs, poultry and fish-breeding). It has to be taken into account that the market of Manila is able to absorb more than the island's total production of esparto products.

In 1982, the **cashew nut** covers a little more than 1,000 ha, produces some 720 T and brings in 1,439,000 pesos.

Almost all trees are planted in orchards, but small farms have their own few trees. This nut is consumed roasted on the spot and the main part is exported. The transformation of the cashew apple into wine has been tempted, but the market is very limited. There are also some local nut roasting units, though the majority of the nut production is exported without being roasted. Sun dryers of family type would help the producing families in drying this high-value product.

The **gold lime** (*Citrus mitis Blanco*, called Kalamantsi) is found everywhere on the island. There are small plantations in the North, in the municipality of Buenavista. In 1982, there were 181 ha gold lime producing 184 T. This fruit is consumed in the form of fresh juice or used to prepare and to accompany some dishes. Guimaras is reputed to export her gold limes as far as Manila. The market exists and deserves a better analysis. The research should help at this level as well as in transforming or using the juice in syrup or soft drink factories.

The other crops are divided into two groups: the food crops and the fruit crops. There is a lack of information on them. Food crops are cassava (there is new processing factory for this plant in Nuava Valencia, but it does not work...), sweet potato, tomato, beans and other similar grains like peas, cucurbits (cucumber, gourd, *Sechium edule*, etc.), cabbage, gombo, peanut, sweet and hot pepper, onion, spinach, carrot and leek. This diversity does not exist in every farm, but each of them has a majority of these cottage crops. Fruit crops are banana, jack-fruit, guava, a hog plum variety (*Spondias purpurea* Line), sweet sop, soursop tree, other citrus, etc. All these plants are cultivated only in small quantities and bring in only little incomes.

In 1981, the **livestock** comprises 217,000 hens, 12,100 bovines, goats and sheep, 11,500 water buffaloes, 17,600 pigs and 7,000 ducks. The value estimation of this production is 257,580 pesos. The island exports beef (neighbouring islanders come to Guimaras and buy meat during the Sunday market) and this is worth being fostered. Goats and sheep, as consumption products, are not in great demand and yet these animals could be produced in far larger quantities as the market of south-eastern Philippines is muslim and open to this type of meat. Local milk is not consumed at all and imported milk only is found on the market. A development programme for local milk consumption must be created and aim young children as consumers. Adults should be made aware of the local milk production thanks to an appropriate programme, completing the one for the children. The value of the grazings allows, as it will be described later, milk and meat speculations on the island. Therefore, it seems that there is no ecological or technical constraint to produce local milk and to increase the meat production on the island.

Pigs are well represented and pork is appreciated in food. This speculation has to be fostered and improved, especially on the level of the performances in food (better utilization of the agricultural sub-products). Poultry is also part of the islanders' every day food, and as for pigs, a specific development programme would promote the creation of family production units with a view to exportation from the island.

Grazing exploitation is not raised to a maximum. There are large fallow surfaces in the orchards and elsewhere, where wild *Stylosanthes* and *Pueraria* can be found, together with *Imperata*. If the fodder value of the latest is low, the value of the two first ones has no longer to be proved. The introduction of efficient fodder varieties and their adaptation to Guimaras' ecologic conditions should form the subject of a research programme completed by a feedlot trial in quick and slow rotation. *Pennisetum*, *Brachiaria* and *Leucaena leucocephala* Lam. de Witt can also be observed there. These plants are consequently known and are already used to feed animals. A feeding technique would be welcome as the island, thanks to her forages, could specialize in family rearing and export its production to other islands. Forages must be integrated into an erosion prevention programme.

Fishing too is not developed at a maximum. There are commercial circuits for fishing products and it seems that there is no problem to sell the present production. If, thanks to the investment in modern fishing equipment and thanks to a better knowledge of the ecological and technical conditions of the fish-breeding, production increased, what is possible, one should then foresee fittings to condition fresh fish into dried or frozen fish (exports to Manila and other main centres). Dried fish is economically obtained thanks to solar driers. The investment in fish freezing and smoking units will first be investigated in order to set up these units judiciously. This investigation would be on a par with the search for modern fishing means adapted to the most current catches of the local fishers.

Charcoal production used to be considerable on the island. The lack of reliable statistics has led to the complete deforestation of the land. Today, char-

coal is obtained with branches of *Leucaena* (it regenerates spontaneously), of coconut palm and of all other tree species available. The research in this field will aim at introducing varieties with rapid growth suitable for charcoal speculation (*Eucalyptus*, e.g.). A plan of re-afforestation on the crests and abrupt slopes will be set up.

It will include 40-are family plots on a land unoccupied by agriculture now. These plots will be used for the family firewood and its charcoal production. The whole plots would cover some 15,522 country families $\times 0.40 \text{ ha} = 6,200 \text{ ha}$. This action will be carried out together with the erosion prevention that is still missing on the island and undermines the island's agro-economic potential dangerously, by a plan that foresees countourlines, wind-breaks or paddock hedges. Wood species will not be tried for carpentry, because the coconut palms provide the wood needed. A detailed cartography of the island is necessary to set up this plan. Cartography will see to topography, to present land occupation and to a schematic plan of the cadastre. All these documents are still missing today: all the maps available and consulted on the spot are approximate or even fanciful what can hinder precise actions.

As it has been shown, Guimaras' farmers dispose of many assets to improve their standard of living by an income increase. Guimaras is not one of the poorest islands in the Philippines and could become a pilot developing zone within a reasonable time. Many things have to be maintained, improved or completed. Only few innovations are necessary.

After this stay, it would be presumptuous to recommend actions that would exactly meet the hopes of both the rural world and the authorities of Guimaras. May we, however, express some proposals with the hope that some of them will be useful to the island: topographic and land occupation map (in 1/20.000); pedological and pedological aptitudes map; market research for rice, maize, mango, coconuts, pineapples, cashew nut, gold lime, tomato, peanut, onion, banana, jack-fruit, log plum, market-garden produce, fish, charcoal; trial of family sun driers (rice, tongues of mangoes, coconuts, cashew nut, fish, and so on...); re-afforestation plan into small family plots.