



Looking back for the future

There has been a marked change in rice farming in Nueva Ecija in recent decades. The ILEIA Research Programme made an exploratory study of development trends and their impact on the sustainability of agriculture in the province. With a better understanding of this process farmers may learn from their

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history and be better equipped to choose appropriate options for the future.

Three important periods in the recent agricultural history in the Philippines' lowlands were studied. (Vargas et al, 1999). However, lack of time and difficulties in accessing information means further study is still needed to get a full insight into cur-

rent trends and opportunities for developing sustainable rice farming.

Pre-Green Revolution

Prior to the Green revolution in 1972, the hacienda system was prominent in Nueva Ecija reflecting the influence of Spanish colonisation. The landlord had a direct interest in rice as a cash crop and the farmers were sharecroppers required to turn over 50 to 75% of their rice harvest to him. The development of transport, and the Cabanatuan-Manila rail link in particular, opened up a market for surplus rice.

By the 1880s, Nueva Ecija had become a major rice exporter, shipping out 500,000 'cavans' (1 cavan = 50 kg) of paddy annually. By the mid-1930s surplus production had increased to 8 or 9 million cavans/year as natural forest and grasslands were brought under cultivation. Farmers produced vegetables such as

maize, string beans, squash, *upo* (*Lagenaria siceraria* Mol.) and *patola* (*Luffa cylindrica* L.) and raised carabaos, cows, ducks and chickens for subsistence. Natural animals and plants such as frogs, fishes, crabs, trees and herbs were important sources of food, fodder, medicine and construction material.

One rice crop was produced annually and the largest paddy yield was 2.5t/ha. Farms were rain fed with supplementary irrigation from small tanks and rivers. Traditional rice varieties were planted and took 5-6 months to mature. Soil fertility management was minimal and involved nutrient harvesting, fallow vegetation and manuring. Farmers recall that the soil was fertile, black and loose, and able to retain water for 2-4 weeks. Earthworms were abundant.

In those days, Filipino rice farmers were essentially organic farmers using



The traditional rice system was an integrated system and included trees, vegetables, small livestock, fish and poultry.

photo: Bert Lor

indigenous production methods well adapted to local conditions. Endemic plants such as *madre de cacao* (*Gliricidia sepium*) and cogon grass warded off pests and diseases and the farmers' belief in God was reflected in farming activities. Prayers or 'oracion', for example, were offered to prevent insects infesting rice seedlings and strong cultural traditions such as 'bay-aniban' (labour sharing), harvest thanksgiving and respect for nature permeated farming. This system remained intact until 1972 when the government launched the 'Masagana 99' development programme.

Masagana 99

Radical changes took place in Philippine agriculture during President Marcos' rule (1965-1986). Structural changes in the agricultural system were effected through the implementation of major agrarian policies, programmes and legislation. Objectives included the implementation of land reform in tenanted rice and maize production areas; self-sufficiency in food production, especially as far as rice was

concerned; the expansion of export crop production; and the promotion of import substitution. These changes were accompanied by Green Revolution technology and agribusiness development.

The Agrarian Reform changed the land tenure system from share to leasehold and introduced a government controlled fixed rent. In 1982 this was between 9-15 cavans of rice per farmer. Rice and maize land above a landlord's entitlement was redistributed and farmers became leaseholders and amortising landowners with holdings of between 1.2 and 3 irrigated or rain fed hectares. However not all farmers benefited from the redistribution.

The *Masagana 99* programme introduced in the early 1970s persuaded farmers to adopt the 'Green Revolution' technology package developed by the IRRI. It offered farmers collateral-free loans at relatively low interest (12%), a subsidised package of HYV seeds, and chemical fertilisers and pesticides. Land preparation was mechanised, and hand tractors, rotators and threshers replaced carabaos. The construction of the Pantabangan Dam and the development of the National Irrigation Agency (NIA) gave many farmers access to cheap irrigation.

The Central Luzon Loop Survey, conducted by IRRI in 1980, reported that between 1966 and 1975 there had been a 95% increase in the adoption of modern varieties. This, together with chemical fertilisers, pesticides and improved irrigation made double cropping possible. Productivity increased from about 2 t/ha per cropping season in the early 1970s to 4 t/ha in 1985. By 1977, the Philippines was self-sufficient in rice and exported it as well. Between 1966 and 1979, the average Central Luzon farmer increased rice output by 80% and his or her annual rice

At the same time, socioeconomic conditions improved at village level. Villagers had better access to health services and education, they were able to upgrade their houses and the transport and retail system began to function better, facilitating access to food and goods. In addition, agricultural extension services were intensified and it became easier for farmers to get up to date agricultural information and technology.

Deregulation

From 1982-1983 there was a dramatic decline in agricultural production and in rice in particular. This was precipitated by serious drought caused by *El Niño* and by the general economic situation. Many farmers found themselves heavily in debt and scarcely able to afford the *Masagana 99* technology package. The decline in production forced the Philippines to start importing rice again and prompted the government to advocate a new approach to agricultural development.

Deregulation, with the emphasis on free enterprise and greater private sector investments in agriculture, became the official policy. In 1985, lifting price controls on milled rice, liberalising fertiliser imports and removing fertiliser subsidies signalled the end of *Masagana 99*. The Aquino and Ramos' administrations followed similar deregulation policies and opened up the country to the world market with a shift to high-value export production and the importation of cheap rice. Since 1996, average rice imports have returned to 1960's levels. In Nueva Ecija the yield from irrigated rice has stagnated at about 5 or 6 tons in a good season. Some farmers claim yield has decreased. With a population growth of 2.3% (1994), this scenario will surely lead to a further

Development trends in the Philippines rice bowl

equivalent income by 39%. However, if income from rice production is adjusted against increased input and consumer prices, the real average farmer income in 1979 was only 60% of their 1974 earnings. Thus, despite producing more, small farmers lost out in terms of their power to purchasing other goods.

A study by the Chamber of Agriculture and Natural Resources showed that between 1976 and 1981 wage rates increased 207%, fuel prices 260%, fertiliser and pesticide 126% and the consumer price index 74%. Prices for rice and corn, however, increased by a mere 44% in the same period.

decline in rice self-sufficiency.

The new rice production programme requires farmers to form organisations before they can get loans. Only 15% of the farmers targeted by the government's Grain Production Enhancement Programme (renamed *Gintong Ani* in 1996) have borrowed from the programme's accredited sources. The big landowners benefit most from the programme and can easily get loan privileges because they control production and have strong political and business connections. Most small farmers continued to depend on usurers for their loans and have to pay up to 30% interest per season for this service.

Between 1988 and 1992, the price index for rice only increased 44.1% against increases in the general price index of 65.6%. Farmers' claim profits from rice production continues to fall because chemical fertilisers are becoming less effective and inputs and labour costs increase faster than the price of paddy at the farm gate. The cost and shortage of labour has forced a shift from transplanting rice to direct seeding during the dry season and has meant greater dependence on herbicides and further decreases in farmers real income. Many of them have taken up off-farm activities, others migrate to the urban areas or seek employment abroad. Farmers have increased their efforts to raise chickens, ducks and pigs, cultivate fruit trees such as the mango and grow vegetables like onion, garlic, pepper, and cucumber. These 'side-lines' are becoming increasingly important elements in farmers' cash incomes. However, such products are mainly grown on a contract basis, thus increasing farmers' dependence on agribusiness.

Because agriculture does not seem to have a promising future, farmers are strongly motivated to invest in the education of their children so that the new generation can build its future outside agriculture. In the early 1990s there was favorable economic development in the Philippines. Many new jobs outside agriculture were created allowing the process of economic transformation to proceed quickly. Unfortunately, the general economic crisis in the South-east Asia and a growing negative balance of trade

(US\$ 5,383 million in 1997) increased unemployment from 10.9% in 1996 to 13.3% in 1998 and cut off the supply of jobs outside agriculture.

Sustainability at Stake

Not only is the economic sustainability of rice farming in Nueva Ecija under constant pressure but farmers also face serious ecological problems (see Kabir p 14). Soil quality is deteriorating probably because of imbalances caused by chemical fertilisers, pesticides, herbicides and continuous irrigation. Problems identified by farmers include hard pans, soil acidification and increasingly ineffective nitrogen fertilisers (see Hipolito p 24). Scientists from PhilRice, BSWM and IRRI are concerned about P, K and Zn deficiencies and the low level of organic matter in the soil.

Many farmers not served by the National Irrigation Agency (NIA) installed shallow wells, as irrigation water is one of the most critical inputs in intensive rice production. However, the water table began to fall and farmers had less irrigation water particularly during periods with low recharge such as the 1998 drought. As more wells are drilled and upland watersheds are denuded, there is a growing threat that ground water in Central Luzon will soon be depleted.

Prior to the Green Revolution, the Nueva Ecija farmers used a wide range of traditional rice varieties including *Tjeremas*, *Intan*, *Binato*, *Raminad*, *Wagwag* and *Milagrosa*. These were late maturing and long stemmed varieties and were superior to modern varieties in eating quality.

Today, traditional varieties are rarely planted in Nueva Ecija.

Farm organisms such as frogs, snails, crabs, mole crickets, shrimps, fish and other insect predators vital to maintaining a balanced ecosystem have nearly all disappeared. Many of these species were important and inexpensive sources of food. Health problems have also increased and farmers attribute these to the continuous and intensive use of chemical fertilisers, pesticides and herbicides.

Not all Nueva Ecija farmers were prepared to remain the passive victims of the problems accompanying development. By 1980, KADAMA and KALIKASAN farmers were already experimenting with alternatives to the Green Revolution package. Traditional rice varieties, biological pesticides and organic fertilisers were reintroduced and improved (see pp 19 & 20). Farmers started to rebuild cooperative ties with each other recognising that these had grown weak.

KADAMA and KALIKASAN are sensitive and responsive to the needs of their communities. Looking back at the past they assessed their experiences and made sustainable rice agriculture their choice for the future. In this they are pioneers.

From: Vargas DS, Abon MG, Divina CC. and Bibal LD. 1998. **Agricultural development in Nueva Ecija: the case of Rajal Centro and Triala.** Report for the ILEIA Research Programme.

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The rice economy today is dominated by monocultures.

photo: Bert Loif