

 **CIAT**  
**60198**  
COLECCION HISTORICA

TRIP REPORT

RAPID RURAL APPRAISAL IN MARANHAO BRAZIL  
TO CLASSIFY SMALL FARMER RICE AGROECOSYSTEMS

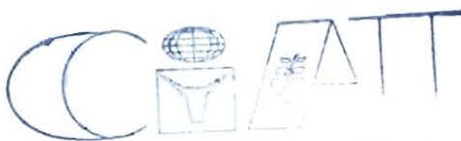
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ABSTRACT

  
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Over a period of four weeks a survey was conducted with cooperation of CNPAF and EMAPA (Empresa Maranhense de Pesquisa Agropecuaria). We spent 23 days in the field, travelled 7000 km and surveyed 44 rice producing communities spread though different Agroecological zones in the state. In each community we met with 5 - 30 producers and held informal interviews of around 2 hours.

All communities declared farming the most important activity and rice or cassava the most important crop. Significant variation exists between the cropping systems and the problems that were identified as the most important. The survey showed that there are four distinct manual rice production systems in Maranhao.

The overwhelming impression over much of the state is of uncontrolled deforestation since 1950 and the subsequent concentration of land in large cattle ranches.

## BACKGROUND

In my job of classifying rice agroecosystems in Latin America, it became evident that the least known sector of rice was that which is produced "manually". The Colombian Rice Census increased our knowledge and suggested that there might be significantly different cropping systems in this sector, with different potentials and problems.

Maranhao was selected for further work because of its overwhelming importance in small farmer rice production. Maranhao has approximately 750,000 ha of rice of which at most 15,000 ha are irrigated to any extent, and 80,000 ha are mechanized upland. Approximately 360,000 families are involved and this could represent over 70% of such rice farmers in Latin America. Furthermore, the State was of interest because it presents some significant climate, soil and vegetation gradients.

The goal of the work therefore was to survey a number of communities in the different agroecological zones and assess what the modal farming systems are and how these vary -- in terms of practices and problems -- with different ecological and social conditions. The assumption is that manual rice production in other states and countries will resemble one of the modal rice systems identified.

In October and November of 1989 I visited CNPAF and EMAPA to organize the survey. At CNPAF, the economist Dra. Sonia Teixeira, expressed interest in participating with a

more detailed questionnaire for individuals, with an emphasis on identifying the role that women play in traditional rice systems. EMAPA also expressed interest and agreed to provide vehicles and counterparts. Because EMAPA salaries are currently completely out of proportion to inflation, I agreed to pay per diems and cover all vehicular costs. Final arrangements were made with Sonia and Luis Sanint during her visit to CIAT at the time of annual review.

#### FIELDWORK

In preparation for the fieldwork, preliminary geographical analysis was made of agricultural census data covering 1959-1987, and municipal population data for 1987. 5 regions were identified based on rice trends and agro-ecological considerations such as soils and climate. A route was devised which would take us through the five regions.

Upon Sonia's and my arrival at Sao Luis, we found that EMAPA had put at our disposal two vehicles, two chauffeurs and two researchers. Of the latter, Mario Ribeiro Mesquita, technical director at the Bacabal Research Station, was my counterpart. He had recently finished a masters at IRRI on weeds in upland rice so was a valuable counterpart to my work. Jonas Mendez Albuquerque participated as counterpart to Sonia, and continued her survey alone for the second half of the trip.

On procedure was a simple version of methods developed by Simon Carter. We preselected communities or small areas based on my geographic analysis. In some cases the selection involved advice from local extension agents and in others we simply followed tracks off the highway until we came to a village. These were invariably rice producing communities.

Once in a community, we would request that at least 5 people involved in rice growing gather for an informal discussion. We then discussed a series of subjects such as land tenure; average area cultivated by a family; crops produced; degree of commercialization of crops; cropping systems; yields; rice varieties used; and use of fertilizers, pesticides and herbicides. We ended by requesting them to identify the main problems that face the community and place them in order of priority. The purpose of gathering a group was to obtain a consensus answer for the community as whole. Simultaneously, Sonia and Jonas would seek individuals and conduct personal surveys.

At the end of the period Luis Sanint and Dr. Nestor Gutierrez (Economist, FEDERAROS - Colombia) travelled with us for two days and we were able to show them the extremes of the different farming system we encountered.

#### INITIAL CONCLUSIONS

The information collected is being encoded and analysed, but some trends are readily evident. Rice is an

important crop for Maranhao culturally, nutritionally and economically. The state ranks third in production, behind Rio Grande Do Sul and Goias. All the communities we visited listed farming as the most important activity, and all but a few listed rice as the most important crop. In the others cases it come in second after cassava. Reasons given for its importance varied, but commonly resembled: "if a Maranhense does not eat rice two times a day - he dies".

Cassava is also very important, with at least 1/2 of the rice areas, or over 350,000 ha, intercropped with cassava. Perhaps even more is intercropped with maize (with and without cassava) depending on soil type and land tenure. Virtually all the farmers also grow cowpeas, but never with rice and mostly as dry season crop. All communities appear to have communal farinha houses, where the bitter cassava is preserved.

All communities reported that the amount of land a family farms in a year varies within each community. However almost all reported that the average was between 0.9 ha and 1.5 ha. The vast majority of the people do not own the land they work.

In the more accessible areas we visited, the single most common landuse is extensive cattle ranching. Particularly in the areas with the best soils and access, the conversion from small farmers' agriculture to permanent pasture is apparently very rapid. Comparison of 1970 and 1987 production statistics show that the only municipios to



drop in rice area were those on coastal sandy soils and those on the very best soils in the center of the state. The latter, Alfisols and Inceptisols, are among the most favored areas in Brazil for upland rice, given 6 to 8 months of reliable rainfall over 200 mm.

In some communities landless farmers are allowed into overgrown pastures to clear, burn, plant rice and maize and reseed the pastures. In these areas cassava is not allowed, and if planted the owners release their cattle in the fields to get rid of it. There are extensive stands of Ebaçu palms which have traditionally provided important income due to the value of the oil and charcoal. However, large landholders increasingly are cutting down these last remnants of the forest, in part to discouraged use of the property by landless communities nearby.

Fertilizer is not used on rice in any of the communities, herbicide is used commonly in the drier part of the state, and pesticides are used commonly in the wetter areas. Land races are by grown over 80% of the communities. However IR-8 is almost universal in the varzeas of the Parnaíba river, while Cica 8 and Cica 7 are preferred in the irrigated area around Ararí. There is evidence that farmers are continually trying alternate types of rice and remain with the one that appears most suited to the land they cultivate.

There is universal recognition that rice does best in lowland areas and yuca in the well-drained areas.

Consequently, the lowland is almost always cited as the preferred land type. However it is also responded that this is the preferred land for the rancher as well, and most of it is fenced off. There is however, theoretically, a huge potential in Maranhao for small scale, wetland rice production.

Finally, four distinct manual rice cropping systems were encountered:

1. "Lagoa" rice, which is transplanted into receding lakes near the Baixo Farnaiba river. It is labor intensive, involves a double transplant, but is said to average about 5 ton/ha (without fertilizer). Though this system is less than 10 years old in the area, they are moving quickly into supplemental irrigation.
2. Arroz na baixada: this is monoculture rice in seasonally flooded depressions in the central area of the state. There is increasing use of plows of in the dry season and increasing dependence on herbicide. In this situation rice is grown every year.
3. Shifting cultivation: this system was encountered in areas where communities are at least three generations old. Fallow is cut and burned after 8 to 10 years, when the bush is thick enough to provide material to fence the field against pigs. Generally, this rice is produced intercropped with maize, cassava and to a lesser extent squash, sweet potatoes and watermelon. Many of these communities also report rice monoculture in the wetlands to which they have

access. Rice yields are said to average around 1 ton/ha in polyculture, in addition to 400 kg of maize and 7 tons of cassava roots.

4. Frontier Rice: On the surface this resembles shifting cultivation in its methods of slash, burn and planting, and is the predominant system in the west and southwest frontiers in the state. However, yields of rice are much higher in the first years after virgin forest: over 2 ton/ha, and are sometimes cropped two or three years in a row. Almost invariably, however, permanent fencing is raised and the length of fallow falls to 2 - 3 years. Yields in the fenced areas average less than 1 ton and as little as 0.5 ton/ha. Yields of maize and cassava are about the same as in shifting cultivation. The trend is that the rice fields are getting farther and farther from the community (ca. 20 km) and most land around the community is degraded pasture. However only a small proportion of the community owns cattle.

#### PROBLEMS

The problems identified by the communities generally followed a trend: If the community has good access to land, transportation and agricultural extension the problem is "mechanization". If the community has good vehicular access, but the inhabitants are generally landless, the problem is "land". Finally, if the village is remote or has difficult



access, the problems are "roads, health and education. Virtually all the communities alluded to the difficulties associated with inflation and stated that the area planted is dropping.

## CONCLUSION

Maranhao is a state where rice, cassava and pastures dominate the landscape. While that in itself does not justify CIAT involvement, it does suggest that CIAT should consider if there is any role for it in an area where its commodities are of such social importance.