



POPULATION
DYNAMICS,
LAND AVAILABILITY
AND ADAPTING
LAND TENURE SYSTEMS
PHILIPPINES



COMMITTEE FOR INTERNATIONAL COOPERATION IN NATIONAL RESEARCH IN DEMOGRAPHY

**POPULATION DYNAMICS, LAND AVAILABILITY AND
ADAPTING LAND TENURE SYSTEMS: PHILIPPINES,
A CASE STUDY**

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Executive Summary

This book powerfully demonstrates the contemporary relationship between the critical determinants of population dynamics on land tenure reform and consequently food security. Population growth rates for the Philippines are still high by regional standards and have not declined—as evidenced by the most recent census—at rates that were previously projected. This only further extends and accentuates the period of growth which the country is ill prepared to accommodate. Already malnutrition rates for the nation as a whole are high despite regional variations. It is not uncommon to have areas with high cereal grain production per capita also suffering from high incidence of malnutrition. The failure of the market to provide employment for large segments of society so that they can procure food is reinforced by a system that denies access to land and thus a more sustained source of sustenance for individuals and family units. The response to these conditions is manifest in various forms of adaptation. The most apparent to policy makers is migration. This comes in three forms. The first is a rural exodus, above all towards Manila but also other regional centers. The second is internationally as skilled and unskilled labor force movement. Critical is the sex and age pattern of out-movement: predominantly female and mostly adolescents and young adults, leaving the residual effects of high levels of masculinity and dependency burdens in the population at place of origin and in the rural labor force. The third is the unskilled and poorly educated and their widespread movement into the public lands of the country which in the Philippines comprise nearly 50 percent of total land area. The absorptive capacity of public lands has in many cases been exceeded resulting in widespread environmental degradation. The potential for this resource to continue to act as a safety valve is being rapidly diminished and may soon be legislatively restricted. In the remaining privately held lands reform has been slow and in cases where it has been implemented the longer term effects, given family demographics, have placed the entire system and motivation for reform in jeopardy. The gaining of one or two hectares might meet some immediate needs, but, given the maintenance of high fertility, in a generation or less, severe fragmentation and inheritance patterns

undermine the possibility of families being sustained on their landholdings. Already clandestine forms of land accumulation are occurring among some farmers in the face of attempts to implement reform or amongst those who have already received land as a result of reforms. With long experience with the ineffectiveness of reform, the population has learned to adapt through the development of a wide range of alternative practices some of which further undermine the legislative reforms that are attempting to ameliorate the plethora of problems they face. While migration is an overt means of adaptation the perpetuation of clan and community based practices that provide food and personal security are critical and in some regions are further enhanced by long term settlement and deep clan ties. The regions settled in the post-World War Two era are the most problematic as they are settled by migrants from different regions with divergent practices and the ties that bind them (natives and migrants, e.g., Mindanao) are weak. These are the areas where social conflict over the provision of land based resources and hence food security is most acute. Overall, the Philippines has only been self sufficient in its primary grain crop of rice for 12 of the last 30 years. The ability to continue to purchase rice from other Southeast Asian producers to meet the growing requirement of the country may soon have to weigh against other pressing expenses in the national budget.

Dedication

This book is dedicated to Father Wilhelm Flieger, PhD, a superb demographer and a distinguished academic and cleric, who taught at the University of San Carlos and conducted research in Cebu and the wider Philippines for many years. He was among the team initiating this research program. Sadly, he died prematurely, at the outset of this project, but he is remembered by all who worked with him on research to which he made such a valuable and important contribution.

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Dr. Peter B. Urich
Scientific Coordinator

Chapter 1: Introduction, Objectives, Rationale, and Theoretical Perspectives

1.1 - Introduction

In the late 20th century the Philippines ‘graduated’ from the position of a low income economy to a lower-middle income economy (Government of the Philippines 2000; World Bank, n.d.). In at least an economic sense the country could be considered to be ‘developing’. Regardless of the economic status of the country, the issues of rapid population growth, stalled agrarian reform and concomitant food security issues continue to impact individuals, communities and the nation. These matters cross temporal and spatial boundaries with rural and urban poverty being the most conspicuous expressions of development failing the masses. The continued prevalence of these issues threatened to either stall or reverse progress made in the 1990s. However, the Asia Crisis of 1997 set-back progress on socio-economic development in the Philippines (Bello 1997, 1998; Vatikiotis 1998). While the Philippine economy and the wider economies of Southeast Asia regained their footing the triple threat of population growth, lack of land reform and food insecurity continued to worsen in the Philippines, yet their importance was overshadowed by the need to resurrect the economy.

Malnutrition rates for the nation as a whole are high despite regional variations and appear to be worsening (Quibria 1993; Cayaba 1997). For example, it is not uncommon in the Philippines to have areas with high cereal grain production per capita also suffering from high incidence of malnutrition. The failure of the market to provide employment for large segments of society so that they can procure food is reinforced by a system that denies access to land and thus a more sustained source of sustenance for individuals and family units.

The response to these conditions is manifest in various forms of adaptation. The most apparent to policy makers is migration. This comes in three forms. The first is a rural exodus, above all towards Metro Manila but also to other regional centers. This

migration is also circular with the flow to and from urban centers linked with the economic climate (Palabrica-Costello 1979; Ulack, Costello *et al.* 1985; Ulack 1986; Hull and Hull 1992; Meyer 1993; Edgecombe 1997). The second form is international as skilled and semi-skilled labor force migration. Critical is the sex and age pattern of out-movement: predominantly female and mostly adolescents and young adults, leaving the residual effects of high levels of masculinity and dependency burdens in the population at place of origin and in the rural labor force. The third form is widespread movement of the unskilled and poorly educated into the public lands of the country which in the Philippines comprise nearly 50 percent of the total land area (Cruz 1984; Cruz, Zosa-Feranil *et al.* 1988; Cruz, Meyer *et al.* 1992).

The absorptive capacity of public lands has in many cases been exceeded resulting in widespread environmental degradation (Lynch 1986; Lynch and Talbott 1988; Kummer 1992; Kummer, Concepcion *et al.* 1994; Urich 1996a). The potential for this resource to continue to act as a safety valve is being rapidly diminished and may soon be legislatively restricted by more serious enforcement of laws.

In the remaining privately held lands, reform has been slow and in cases where it has been implemented the longer term effects, given family demographics, have placed the entire system and motivation for reform in jeopardy. The gaining of one or two hectares might meet some immediate needs, but, given the maintenance of high fertility, in a generation or less, severe fragmentation and inheritance patterns undermine the possibility of families being sustained on their landholdings. Already clandestine forms of land accumulation are occurring in the face of attempts through agrarian reform to limit such accumulation. This is happening as some farmers attempt to thwart the laws of agrarian reform being implemented on their land while new forms of accumulation are being attempted by some whose lands have already been reallocated under the laws of agrarian reform.

With long experience with the ineffectiveness of reform, the population has learned to adapt through the development of a wide range of alternative practices some of which further undermine the

legislative reforms that are attempting to ameliorate the plethora of problems faced. While migration is an overt means of adaptation, the perpetuation of clan and community-based practices that provide food and personal security are critical and in some regions are further enhanced by long term settlement and deep clan ties (Hirtz 1998). The regions settled in the post-World War Two era are the most problematic as they are settled by migrants from different regions with divergent practices and the ties that bind them are weak, for example, conflicts arise between indigenous groups and migrants in Mindanao. These are the areas where social conflict over the provision of land-based resources and hence food security is most acute. Overall, the Philippines has only been self-sufficient in its primary grain crop of rice for 12 of the last 30 years. The ability to continue to purchase rice from other Southeast Asian producers to meet the growing requirement of the country may soon have to be weighed against other pressing expenses in the national budget.

1.2 - Objectives

With the above in mind this book sets out to demonstrate the contemporary relationships between the critical determinants of population dynamics on land tenure reform and consequently food security. The most recent census shows that population growth rates for the Philippines are still high by regional standards and have not declined at rates that were previously projected. This only further extends and accentuates the period of growth which the country is ill prepared to accommodate. At the macro level we explore beyond the usual linear explanation of the relationships between the variables of population, food security and land tenure systems to include the complex feedback mechanisms that are multi-directional. In part, this is achieved by recognizing the impact of migration on the population dynamics of the nation and localities. Previously this important and emerging trend has been neglected in the study of land tenure change and food security issues. At the meso and micro scale of analysis we examine how these population trends let the pressure off tenure systems. We also look with more depth at consequences of the changing population structures as we move beyond age-structure conditions to include more nuanced sex ratios and gender relations at the micro level. Underlying and related to

population issues are an array of cultural practices and norms of conduct which in many ways limit the possible range and effectiveness of tenure system reforms. These issues are well illustrated in the case study material.

More specific questions are asked to inform the general discussion of the interaction between population dynamics, land tenure systems, and food security to address gaps in current research. The primary questions include the nature of the constraints within population dynamics and land tenure reform that may be influencing change in agricultural productivity. We also explore the relationship between population growth and increasing yields and long term investments on farms as this relates to overall food security. We question, within the Boserup (1965) hypothesis, whether it is the case that in low population density areas, away from urbanized areas, productivity is generally kept at modest levels, but with increasing population, agricultural intensification ensues to feed the increasing population. Land tenure systems and the cultural context of their evolution are studied at the micro level to deduce if they are an important obstacle to increased productivity and if so how these constraints might be mitigated, and; finally, what capacity the population engaged in agricultural activity might have for intensifying their production and increasing their productivity. Within each of these questions is an overarching thread that seeks to unravel the role of cultural adaptation to population change, lack of land reform, and increasing food insecurity and how these intercede with a potential for future change and adaptation.

1.3 - Rationale

The 'Charter'¹ that has guided this research project was written by Philippe Collomb (1997) in response to a series of international conferences beginning with the Population and Development Conference held in Cairo, Egypt in September 1994. While much was written about the demographic impact on development, in previous world population summits in Bucharest (1974) and Mexico City (1984) the inclusion of sustainable development issues within the sphere of population was most explicit in the proceedings of the 1994 Cairo conference.

From the Cairo conference two objectives were tabled and accepted that drew upon the desire to integrate population concerns more fully into two major streams of thought. The first relates to development strategies, planning, decision-making and resource allocation at all levels of administration and in all regions, with the goal of meeting the needs, and improving the quality of life, of present and future generations. The second relates to the promotion of social justice and the eradication of poverty through sustained economic growth in the context of sustainable development. Population concerns figure prominently in these objectives because, among other reasons, a reduced rate of population growth can provide additional time for societies to adjust and plan for future population increases. This can then enhance a country's ability to attack poverty, protect and repair the environment, and build a base for future sustainable development.

Influential in the shaping of the goals of the International Conference on Population and Development (ICPD) was the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil in 1992. From this, the Agenda 21 initiative was crafted, uniting the international community to agree on the objectives and actions aimed at integrating environment and

¹ The complete title is *Population Dynamics, Land Availability and Adapting Land Tenure Systems* which was written under the auspices of the Committee for International Cooperation in National Research in Demography in Paris, France at the request of the Land Tenure Service, Rural Development Division of the Food and Agriculture Organization, Sustainable Development Department.

development. Imbedded within the framework was a specific reference to demographic factors:

Agenda 21 has been conceived as a response to the major environment and development challenges, including the economic and social dimensions of sustainable development, such as poverty, consumption, demographic dynamics, human health and human settlement, and to a broad range of environmental and natural resource concerns. Agenda 21 leaves to the International Conference on Population and Development further consideration of the interrelationships between population and the environment (UNEP 1992).

A primary goal of Agenda 21 was to “ensure that population, environmental and poverty eradication factors are integrated in sustainable development policies, plans and programmes.” Governments would as signatories to Agenda 21 also “take measures aimed at the eradication of poverty, with special attention to income-generation and utilize demographic data to promote sustainable resource management, especially of ecologically fragile systems.”

At the World Summit for Social Development held in Copenhagen in 1995 the issue of access to land and resources was given due emphasis. Access to land along with credit, information, infrastructure and other productive resources with a focus on the disadvantaged sectors of society was seen as a high priority. This concern extended to the access to food, through increased food production and sustainable development of the agricultural sector with the view of alleviating poverty, reducing malnutrition, and raising standards of living.

It was however the World Food Summit (WFS) in Rome in 1996 that firmly linked food security with population growth and the wider demographic phenomena. It was noted in the Rome Declaration that poverty was a major cause of food insecurity and that poverty reduction was critical to improve access to food.

Increased food production could, it was stated, be achieved by “sustainable management of natural resources, elimination of unsustainable patterns of consumption, particularly in industrialized countries, and early stabilization of the world population”. Poverty, hunger, and malnutrition are just three of the principal causes of increased migration from rural to urban areas in the developing world. In the Philippines, as elsewhere, the greatest population shift in human history is currently underway; this is the shift in gross numbers of people from rural agrarian areas to ever burgeoning urban environments. If these problems are not addressed in an appropriate and timely fashion the political, economic, and social fabric of countries like the Philippines and many others could be seriously affected (Barber 1997; Economy 1997). In response to these global and local phenomena there was a call within the WFS to “fully integrate population concerns into development strategies, plans, and decision-making, including factors affecting migration.”

Finally, land reform was included in the Declaration on World Food Security at the WFS. There was a demand for appropriate legal and other mechanisms to advance land reform to protect property, water, and user rights and to enhance access for the poor and women to resources while fostering sustainable use of those resources.

The Philippines is one of 88 low income food deficit countries of the world (USAID 2001). There is therefore a need to increase food production to reduce rural migration and to support the already burgeoning urban population. However, interventions that might reverse current trends but are founded on a rudimentary understanding of the relationships between deficient production of food, population change and tenure issues could be seriously misguided. A more nuanced understanding of the theoretical underpinnings to the complex relationships between the three broad variables is necessary.

1.4 - Theoretical perspectives

Population growth is often blamed for increasing pressure on resources and the means of production. Consequently population growth is linked with excessive land fragmentation, problems of access to land, or at minimum hindering the work and progress of those persons entrusted with the cultivation of land under an array of formal and informal agreements. Population is generally linked with factors of insecurity of land tenure and in the form of agricultural exploitation of land. There is a belief that insecurity of land tenure leads to unsustainable exploitation of resources and is further associated with a lack of long term investments in land i.e. landesque capital (durable infrastructure added to the landscape to enhance agricultural production over the longer term), thus undermining the potential for increased yields and greater resource sustainability.

In the case of the Philippines and land holding conditions, there are traditional and culturally formalized systems of land holding co-existing within a legal, institutional and formal framework formulated and implemented by the State. What results are highly localized, hybridized tenure regimes. These can be an obstacle to the intensification of agricultural production. Under such conditions governments and other agencies concerned with development are in search of institutional means to guarantee security of tenure to increase agricultural production and productivity but are often unaware of the complexity of the local situation.

Two approaches have been adopted. The first is an institutional one that attempts to ensure producers' rights of access to the means of production. This is from an individual's point of view or an actor oriented approach. Secondly, there is the technical approach that attempts to determine the physical, pedological and economic limits of rights access, thus forming an environmental approach. There are important research gaps in this arena. First, very little is known about the real demographic weight of different players on a given geographic land area. Secondly, we know very little about how we can evaluate the consequences of changes in population dynamics and structures on production systems, agrarian

structures, systems of land tenure, and on agricultural production and productivity. Therefore, solutions involving land tenure reform might only be one of a number of possible interventions to be considered in response to the challenges of population growth since tenure is linked in multiple ways to intensification of agricultural production. Brookfield (1993) provides a useful overview of these hypotheses based on population and they are worth reviewing here.

In the Classic form the growth of population pressure on land resources leads to land resource degradation through: 1] clearance of marginal lands and extension of cultivation onto steep slopes; 2] the shortening or elimination of fallow periods; 3] reduction in size of land holdings, with concomitant increases in tenancy, landlessness and “peasant immiseration” (Brookfield 1993:29) leading to the mining of the soil; and, 4] the loss of capacity to repair damage due to economic impoverishment. The Boserup theory and its multiple forms focus on population pressure on resources leading to an intensification of agricultural production, with associated investments in resource conserving technologies and cultivation methods for the following reasons: 1] intensified systems are known and/or can be invented but they will not be until there is a perceived need (benefit-cost); 2] the marginal lands that are incorporated into the agricultural milieu are done so only with intensive preparation and management; and 3] population pressure leading to an involution in agriculture requires the development of labor-intensive systems to increase labor absorptive capacity.

There are alternative theories to the above that warrant attention. Population pressure can also create conditions that will limit adoption of improved land management systems: 1] labor can be garnered very inexpensively therefore there is no incentive to replace labor with capital and technology; and, 2] high mortality and even severe famine can be ‘tolerated’ as long as the land-holding class can maintain control of their land holdings and experience no decline in their quality of life (Brookfield 1993:30).

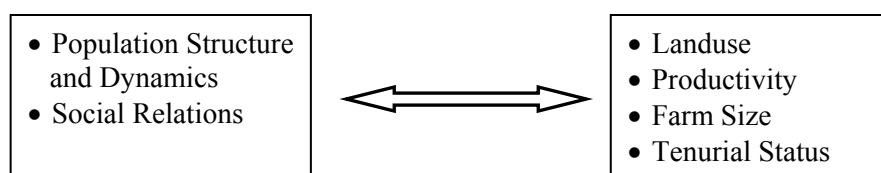
Agricultural intensification is often thought of as being derived exogenously, initiated by different private, public or international players. It may have a strong technological bias in that it will require agricultural producers and workers to acquire new

knowledge based on new production technologies. The means to these ends are complex and difficult to envisage in the Philippines given the lack of educational infrastructure for farmer training, the lack of financial means to administer such a system, and the lack of economic incentives (low commodity prices) that most high population growth countries like the Philippines face.

Hence there is a need for an investigation on the theme of adapting systems of land tenure to changes in population dynamics and structures in the most varied demographic, agro-economic, infrastructural and human contexts. This book is thus part of a much larger series of such studies across a number of nations that are grain dependent, have rapidly growing populations and have limited cash reserves for securing the projected food requirements for their people.

To accomplish this we detail the relationships between population structure and the dynamics of migration, in particular, for the nation as a whole but more importantly for the case study villages and the systems of landuse, productivity, farm size and tenurial status. In our discussion, as defined by the guidelines for conducting this research, it is assumed that population factors are the driving force behind decisions made with reference to land tenure and hence landuse and productivity. It is our experience in the Philippines that privileging one set of variables (population versus land tenure) as the proximate cause for the function of rural communities is problematic. We will find through the course of this book that it is in many cases the land tenure situation that influences landuse, productivity, and farm size, and this in turn affects the population dynamics whether it is through reduced family size or migration. Often these social relations are imbedded in cultural traditions that in spite of the global modernization project are still firmly controlled by family and interfamily relations that reflect local social, cultural, and environmental realities (Hirtz 1998). For these reasons we address the relationship in a recursive manner acknowledging that the influences can work in two directions (see Figure n° 1.1). We also discuss them on a village by village basis before attempting a synthesis.

Figure n° 1.1 – The recursive relationship between key variables in this study



1.5 - Insufficient Knowledge

There is insufficient knowledge on the relationships between population dynamics, the means of production (in this case, access to land) and subsequent agricultural production. This paucity of knowledge is rendered more serious and complex by the fact that the relationships are less stable today than in the past. New population movements (definitive, temporary or circular) are linked in complex ways with agricultural production, which then in a recursive manner impact on agrarian and land tenure situations. In a general sense the population dynamics of rural areas are changing in ways and rates unseen before. There is the growth of large rural agglomerations while at the same time societies can be characterized by dispersion of rural settlement, all of which must be put into the context of the evolution of rural populations that are no longer strictly and wholly linked to agricultural production. Increasingly, there is evidence that rural development and rural populations are highly influenced by markets and this is where substantial agricultural intensification has occurred.

Similarly, the understanding of population in the context of rural production and land tenure change is poorly developed. Many factors have an impact on population dynamics and structures and the way they evolve. These have strong linkages with the way that land tenure systems change.

Migration is a recurring issue that can bring about a substantial modification in the age and sex structure of a population in a rural area. It can result in change in the age structure and

sometimes this is incorrectly inferred in the literature to mean an aging of the population owing to the departure of young adults. A shift in the sex ratio or sex structure occurs when one sex is more prominently involved in the process of migration. This results in increasing dependency burdens in rural areas, with the very young—sometimes supplemented by children sent from urban to rural areas for rearing—and elderly, left behind. Migration can influence the structure of agricultural production. This may be reflected in the number of rural families having income from non-agricultural activities, and the feminization or masculinization of the population engaged in agricultural production. However, national statistics may not reflect this rather nuanced condition. In previous models in the Philippines (for example, Population, Agriculture and Development (POPAGDEV)) the primary concern was population growth owing to high fertility rates rather than the changes resulting from migration.

The study of the relations between population migration, changes in land, and changes in agricultural production and productivity will provide insights into the appropriateness of current interventions in the land holding patterns of the country. Where interventions are ill placed they should be challenged as government actions and interventions should involve both population changes and alterations in that population's activities. As we shall see in this study, migration is an important theme with far-reaching consequences in the land market and agricultural labor force participation.

Population mobility can induce a greater number of land transactions at the places of origin and arrival of migrants. At the places of origin these transactions are both economic and social in nature between individuals in a family and also with those whose status and situation changes through mobility of themselves and those around them. At the places of arrival these land transactions often take place in a climate of intensified competition as the number of players is increased and the resource base, often around an urban market area, is finite. These situations can be a source of litigation and severe conflict concerning use, appropriation and transmission of land.

A person's participation in agricultural activity is central to the study of the links between population dynamics, changes in the agricultural production system and the adaptation of systems of land tenure. Very important decisions regarding the choice of either owning land, if indeed one has a choice, or simply having a guarantee or right to exploit land for any length of time all depend on the agricultural production systems and the adaptation of land tenure systems. It is therefore important to know whether adjustments to a system of land tenure, either directly or indirectly, respond to an objective concerning agricultural production, or whether these adjustments are a response to an objective of a cultural nature.

In the following chapter we introduce the methods for addressing these complex issues. To a degree, our approach was defined by the charter, but there was scope for interpretation, and for application of our particular disciplinary expertise. We sought to create a more inclusive, transdisciplinary methodology to address these complex issues.

Chapter 2: Methods

2.1 - Introduction

It is important at the outset, to set the context for the methodological approach applied in this study. The Charter written by Dr. Collomb expressed the requirements for analysis which we outlined in Chapter One. To answer the questions, a methodology was also provided within the Charter. The methodology was devised so that it could be applied in a number of countries to facilitate comparison. The methodology was thus broad enough to be applied in a host of political, social and ecological environments. Our application of the methodology was one of the first and it was not without complications. Our description of the methods will not delve into the process of adaptation and consultation which we engaged in with Dr. Collomb. Rather we submit a review of what was decided could be done given the limitations of time and finance, and some specifics of who completed these tasks.

The first step in the project was to define potential collaborating research centers. Dr. Urich had nearly two decades of experience working in population, agricultural and land tenure analysis in the rural Philippines. For the last six years he has been a collaborating partner in a consortium known as the Conservation Farming in Tropical Uplands (CFTU) Program; an interagency network of Organizations concerned with addressing critical agricultural, social, and environmental issues in the tropical uplands of the Philippines. Through the membership of CFTU, Dr. Urich was acquainted with Dr. Balbarino of what is now known as Leyte State University (hereafter LSU) (formerly Visayas State College of Agriculture). Dr. Balbarino, on behalf of the Farm and Resource Management Institute of LSU, enlisted his colleagues in the project. Dr. Urich, under the guidance of Professor Pool of the Center for Population Studies at the University of Waikato identified the demographer Dr. Wilhelm Flieger, the then Director the Office of Population Studies at the University of San Carlos located in Cebu City, as a possible collaborator. Thus, as required by the Collomb Charter, one agricultural and one demographic research center were approached. Missions to each institute were conducted in 1998 to

refine the terms of reference for the project and to introduce the staff of each institute to the other. Just prior to the signing of the contract for the project Dr. Flieger passed away and an emergency mission was conducted to elicit support for the project with the new Director of OPS, Dr. Socorro Gultiano. It was agreed that the project would continue with OPS's participation under Dr. Gultiano's leadership.

The research itself was primarily guided by the Collomb Charter. The Charter compartmentalizes the research project into four stages. In each stage there were sub stages or phases (33 in total). Within each stage, reports were required and these formed the basis for the overall report to FAO and subsequently this book. Stage One of the Charter formed the overview of population and land tenure systems at the national and regional level. At this point the research team defined regional in the context of the Philippines as provincial (see below). Each research centre then had a series of research tasks to undertake including the mapping of typologies at the provincial level to discern national variation in population, food production and land tenure. This initial stage resulted in data being collected from the national census of population published in 1990, and the census of agriculture published in 1991. Historical data from previous population and agricultural censuses was relied upon when possible. We also drew on the limited results of the recent 2000 census whose results, minus the socio-economic disaggregations, have only just been released. The next agricultural census has been delayed. The Charter stipulated that data used in the analysis be temporally standardized thus we were reliant on the 1990/1991 data for the bulk of our analysis. The mapping required in Stage one was carried out at FARMI and OPS with final consolidation occurring at OPS.

2.2 - Units of analysis – stage one

In discussions between the two collaborating institutions a baseline set of geographic units was defined for the purpose of this project. Sub-national boundaries in the Philippines are in a state of flux as population levels increase. Therefore, the base map for the Philippines and the boundaries of regions, provinces, municipalities

and barangay² (villages) was derived from data relevant to the mapping of the censuses of population and agriculture from 1990 and 1991, respectively. Based on these data of 1990/91 we defined our study area to be composed of 15 regions and 74 provinces. Our level of analysis for the so-called ‘basic geographic unit’ defined in the Charter is the province. Since 1990 the Philippines has been further fragmented administratively with the 2000 census of population defining 16 regions and 78 provinces. This is excluding the chartered cities and National Capital Region (NCR) which encompasses the greater Manila area. We also decided to disregard the National Capital Region within some of our analysis based on 1990/91 data. The National Capital Region is a highly urbanized area. Only 3.5 percent of the National Capital Region’s population aged 15 and over were working in agriculture (Republic of the Philippines 1990). We have not included it in the analysis of agricultural statistics. In computing population projections, migration rates and trends and, other demographic issues, the NCR data have however been included.

While regional analysis is conducted at the level of the province, the local level analysis in the case studies is at the barangay scale within defined municipalities. A base map of the regions and provinces defined for this study is found in figure n° 1.2. A description and map of the case study areas is provided in Chapter Six.

2.3 - Stage two

To complete Stage Two the collaborating institutions were required to define areas which had already been subject to detailed land studies and also areas where population, settlements and mobility have been studied. We were tasked with identifying one or two study areas where adapting systems of land tenure appeared urgent and to justify the choice(s) if they were not areas already subject to intense study. Throughout this study we attempted both

² A barangay is the smallest geographic unit in the Philippines for which formal political representation is made through the election process. A smaller unit known as the *sitio* exists and while identified locally it is not recognized by the State as having formal political representation.

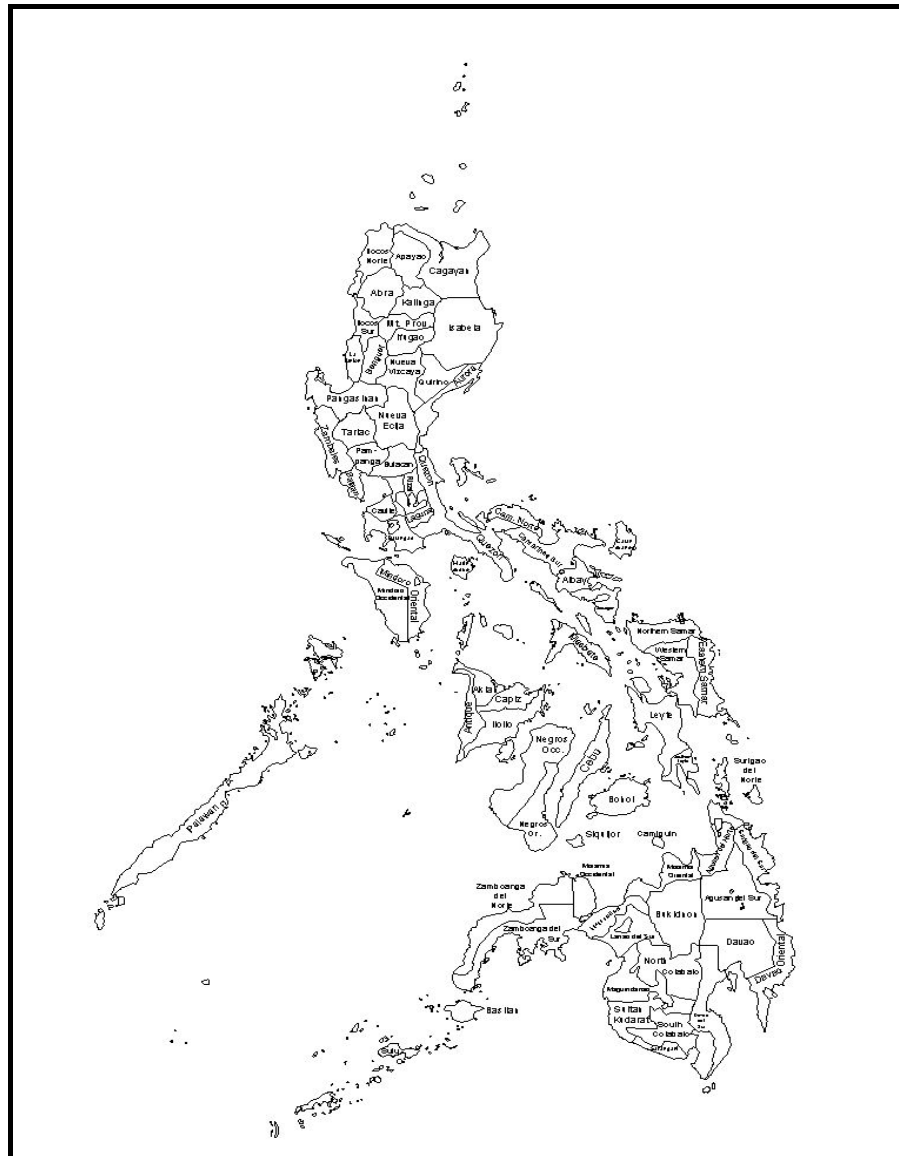
by design of the Charter and through the limitations of time and money to rely heavily on previous studies and associated reports. It was decided that given the heterogeneity of the Philippine archipelago it was impossible to characterize the relationship between the identified factors by analyzing one study area and then up-scaling the outcome to represent the country as a whole (Larkin 1982).

After consulting with Dr. Collomb it was decided that an agricultural typology method would be applied to the choice of study areas. Within the limits already discussed it was decided that three agricultural systems would be examined: upland, mainly dry cropped (one site being rural and in the periphery, the second closer to the core in a peri-urban environment); a lowland wet rice system; and, finally, a former sugar plantation. These agro-ecosystems provided a cross-section of agricultural production units that reflected more traditional, small scale agricultural activities while also exemplifying where problems lay in terms of peripheral upland economies placing pressure on forest resources and on watersheds critical to the lowland, dominant, wet rice economy. The historical legacy of Spanish colonization was explored by using the case of a lowland sugar hacienda whose land was being reallocated under agrarian reform.

2.4 - Units of analysis – stages two through four

We were constrained on the choice of sites for preliminary study by the lack of funds for travel and extensive fieldwork. Therefore, three of our study areas are located on the island of Leyte and the fourth in Cebu. It could be argued that we were too focused on the Visayan region and hence the applicability of our findings are limited to that region. We would argue that this need not necessarily be the case. From a reading of the literature it is evident that the

Figure n° 2.1 – The Provinces of the Philippines



problems facing upland farmers in Leyte are similar to the issues facing upland farmers throughout the archipelago. The same applies for lowland wet rice economies, and haciendas. It is therefore the dominant agricultural system in the place of study that we find as the common element. We do not however contend that our choices represent the Philippines in their entirety. In fact, we would argue that each household is distinctive in its adaptation to population and agrarian change. At the level of aggregation of our data, however, we think that there are common issues that cut across Filipino rural society and can thus be exemplified by the choice of dominant agro-ecosystems for study.

Specifically, the rural, upland, peripheral study area is located in the southernmost reaches of Leyte province (on the border with the province of Southern Leyte) on the island of Leyte in Region VIII, or Eastern Visayas). The village of Sta. Paz was chosen as an example of an upland area for several reasons. It is peripheral, both from the provincial capital and in relation to the Poblacion or town centre of Matalom. Its agro-ecosystem is similar to many peripheral upland areas throughout the country, with small, isolated plots of wet rice grown when and where conditions permit but more commonly defined by their mixed annual crops of maize and sweet potato along with coconuts and other fruit bearing trees such as bananas. Production is for the home but also whenever possible for sale. Access is by a poorly maintained road that can become impassable during heavy seasonal rains. The population is growing and youthful and its mobility is strongly determined by local change and developments.

The upland peri-urban barangay (villages) of Cebu City were chosen to contrast with the peripheral upland location of Sta. Paz. In peri-urban Cebu four barangay: Cambinocot; Aagsungot; Sudlon 1; and, Tagba-o were chosen for their status in terms of land tenure in relation to the protected areas designation. We were not only interested in exploring the relationship between land tenure and population in peri-urban environments but also the relationship between these variables and protected areas status. Peri-urban Cebu is similar to many urban areas of the archipelago that have on their periphery important watershed areas and national parks that have been legally protected so as to maintain biodiversity and

hydrological resources. In such cases the pressure to occupy these lands is great. Therefore four villages in peri-urban Cebu were chosen for this study. Also the peri-urban environment of Cebu has been intensively studied and the recent release of reports from these studies provided us with ample data to conduct what was required under the Charter.

The lowland wet-rice village of San Isidro, located in the municipality of Baybay, Leyte was chosen for several reasons. It is located in the vicinity of LSU. The village is predominantly involved in wet irrigated rice production and hence exemplifies that type of dominant lowland agricultural system common through much of the lowland Philippines. The social and political systems of resource control and production were well known to the research staff of LSU and data for this study could be efficiently obtained. In the Philippines, interventions in terms of government programs toward increasing rice productivity have been biased towards the wet rice lowland agro-ecosystem. Interventions may include, among others, fertilizer and seed enhancement programs, integrated pest management and land tenure reform. All of this investment in one lowland agro-ecosystem has come at the expense of research and development activities targeting other agricultural sectors. The choice of San Isidro then permitted us to look in on a village that, like many other lowland wet rice villages, is well connected to the core through all weather roads along which technicians and other agents of change regularly travel.

For similar reasons as those noted for San Isidro, the village of Boroc situated in the relatively large regional city of Ormoc, Leyte, constitutes an important case study site. A great deal of emphasis in government—with the insistence of the marginalized peasant cultivators—has been placed on haciendas for agrarian reform. The agricultural potential of such large tracts of land, their tendency to be located in lowland areas with relatively high quality infrastructure provides the opportunity to explore the relationship between government policies on agrarian reform with an actual case of its ongoing, active implementation. Boroc is a former sugar plantation that is in the process of reallocating land to peasant cultivators. The methods whereby this land is being expropriated and claimed are not unique to this place and thus the activities tie

Boroc to the larger issue of decommissioning of haciendas across the country (De los Reyes and Ateneo de Manila University, Institute of Philippine Culture 1989; Kerkvliet 1993).

2.5 - Stage three

The third stage of the project required the research team to evaluate the landuse, productivity, farm size and land tenure systems for each of the villages. The main thrust of the third stage was to address the land tenure status and security of tenure issue. We were to define security along a continuum from the 'maximum' level, which in the Philippines we defined as having full title to the land under an individual's cultivation. The second level as defined by the Charter was an 'upper intermediate' level which we translated to be holding a tax declaration for the land under cultivation but not a formalized title. The third level was defined as 'lower intermediate' which in the Philippines we felt was commensurate with a registered tenancy under the current laws of agrarian reform. The fourth and final category was 'the minimum level' which in the Philippines was squatting on private or public land or having a simple verbal agreement to cultivate land. There are important sub-classes within this typology which will be discussed in later chapters.

In the third stage of the study we were also required to address the issue of malnutrition and its relationship with land tenure, and the issue of access to land for the poorest segment of society and by women. The data for this component of the study were derived from national statistics and the laws governing ownership of land which are explicit regarding the rights of women to own land. The relationship between production and levels of malnutrition proved to be interesting and are returned to at the end of Chapter Five.

2.6 - Stage four

The fourth stage of the project explored the acceptability and effects of the systems of land tenure on society. Qualitative studies were undertaken in the upland village of St. Paz, Matalom; the lowland wet rice village of San Isidro, Baybay; and, the agrarian

reform community of Boroc, Ormoc. Rapid rural appraisal methods were applied along with community mapping of resources and population distribution. More detailed questionnaires of household composition including population variables with a focus on migration and socio-economic conditions were administered to 50 households in each of the villages. These surveys were augmented by focus group discussions on issues pertaining to perceptions of land tenure, its change and future prospects. Secondary literature was sought. In the cases of St. Paz and San Isidro the volume was more extensive than for Boroc. This reflected the longer term interaction of research staff from LSU with the former villages over the latter.

For the peri-urban environment of Cebu high quality and intensive studies of village life were recently completed by the City of Cebu, other National government offices, including the Department of Environment and Natural Resources (hereafter DENR) in collaboration with the academe and cause-oriented non-governmental organizations (hereafter NGOs). The Office of Population Studies had been involved in the research program of the DENR that involved socio-economic profiling of the peri-urban barangay. Qualitative research was undertaken, for example, by the Cebu City Landuse Committee/Technical Working Group who in 1998 produced the very informative *Interim Land Use Plan and Resource Management Policy Guidelines of the Hillyland Barangay of Cebu City*. Similarly, the NGO Cebu Uniting for Sustainable Water produced a high quality volume in 1998 titled *Land Ownership and Land Use Types in Upland Barangay Within the Protected Areas of Cebu City*. The University of San Carlos (2000) weighed-in with their study conducted for the DENR titled *Socio-Economic Profiling and Environmental Study of the Four Protected Areas in Cebu Island Vols. 1-5*. These volumes and other literature garnered from government and NGOs provided us with excellent qualitative and quantitative information that formed the basis for our analysis.

From the surveys and literature we completed the fourth and final phase of the Charter by exploring possible scenarios for intervention in the land tenure regime. This necessitated an exploration of constraints to acceptance of change and possible

deadlock situations that may arise from economic or structural problems, excessive population pressure on productive resources or investments in infrastructure. These issues were explored in focus group discussions and through the literature. This analysis culminated in a synthesis of the findings from the case studies in relation with the national typologies discerned during the macro analysis of Phase One.

2.7 - Comparative analysis

Special mention needs to be made of methods devised to accentuate the cross national character of this study. While the individual characteristics of the countries studied by the Charter are paramount, some cross comparability is also desired. Two indexes were devised by Collomb that are to be applied to all the countries studied. The first is designed to measure the participation of individuals in agriculture without retaining the internal structure of the collective unit derived from census data, which in this case is the household. The index is constructed using the following information: 1] sex ratio of household heads employed in agriculture, classified into three categories: less than 0.90, 0.90 to 0.99, and 1.00 and above; 2] sex ratio of the agricultural labor force, classified into four categories: less than 0.80, 0.80 to 0.89, 0.90 to 0.99, and 1.00 and above; and, 3] the ratio of men in the agricultural labor force aged 15 to 34 to those aged 35 to 54 using the same four categories as in 2 above. From a combination of all these categories, 48 new categories are derived (see Appendix 1) and into which each province of the country is classified.

The second index was applied at the local, case study level to measure participation of collective units (households) in agriculture and consisted of 57 categories (see the first chart in Appendix 1). It is a three-digit number which takes into account: 1] the sex of the household head and whether he or she is working in agriculture or not; and, 2] the number and sex composition of household members engaged in agriculture as well as the sex and age composition of the rest of the household members. Both indexes are provided in Appendix 1. Table n° 2.1 illustrates one aspect of the local level index.

Table n° 2.1 – Index defining the participation of the head of the collective unit at the local level in agriculture.

The head of the collective unit is	The head of the collective unit	Category
a man	participates in agriculture	1
	does not participate in agriculture	2
a woman	participates in agriculture	3
	does not participate in agriculture	4

This first number is then combined with the results defining four series of possibilities referring to the number and sex of household members aged 15 and above engaged in agriculture or not in agriculture but in the labor force, or not in the labor force; as well as the presence of children less than 15 years of age and people 65 years or older in the household. The third column in the first chart of Appendix 1 must be read as follows:

- First item: at least one man in the labor force (aged 15 or over) not employed in agriculture.
- Second item: no to the previous item and at least one man (aged 15 or over) not in the labor force.
- Third item: no to the two previous items and no men aged 15 or over.

The matrix was altered slightly from that presented in the original Charter. Alterations did not change the overall thrust of the index but did clarify its implementation.

2.8 - Limitations of the data

The study, as already noted, was based largely on data from the 1990 and 1991 censuses of population and agriculture, respectively. The 1990 census of population was provided by the National Statistics Office (hereafter NSO) in digital form. However, the 1991

census of agriculture was not available digitally, just as hard copy volumes by province. A set was purchased and the relevant data, both nationally and for the provinces and localities of the case studies was manually encoded. This was a labor intensive activity and undoubtedly errors crept in. However, the research institutes are now in possession of some rich digital databases from which future studies may be spawned. The linking of the data from Excel spreadsheets to a geographical information system facilitated the mapping that underpins an important part of this study. Other data sets were also digitized from hard copies provided by various departments of the government.

The reliance on secondary sources of data may also be criticized. While long term empirical research would perhaps have been beneficial the authors' understanding of the issues pertaining to each study area permitted them to critically assess the quality of the secondary sources of data and only those which were deemed of high quality were incorporated in the study.

At the macro level, limitations were dictated by the type of census data and how it is made available to researchers. We were reliant on the definitions, for example of household head, used by the census. We also encountered constraints as the data referring to labor force participation in agriculture, tenure, and farm status within the agricultural census were problematic, and productivity data were poor, or for corn, non-existent nationally. There was also the problem of the lack of appropriate disaggregation for urban and rural for agricultural data and also for 1995 and 2000 population data.

Perhaps the greatest limitation of the study was the small number of case studies. The breadth of the study was determined to a large degree by the framework presented in the Charter. We in fact expanded the required number of case study sites from one or two to four sites and seven barangay. We have already discussed the rationale for this and must fall back on the inadequate but appropriate excuse that this is a pilot study of these relationships which we believe will either be affirmed or refuted by longer term and more detailed studies in specific sites or in future research by this team or other independent researchers. Regardless, any

shortcomings in data collection, analysis and interpretation are the responsibility of the research team and not the funding agency or our advisors.

2.9 - Roles of institutions

The transdisciplinary nature of this study challenged the individuals charged with the mandate of implementing the Charter. Guidance as to roles and responsibilities was to a degree framed by the Charter. Each of the institutes was guided to collect and analyze specific types of data and at times were directed to work together. In most cases these guidelines were followed but frequently we discussed data sources, analysis and interpretation together. This engagement at all stages of the project was, we believe, very important in gaining a more transdisciplinary perspective on the research being undertaken.

2.10 - Structure

The first section of this book provides an overview or macro view of the current situation in reference to the population and agricultural geography of the Philippines in the context of this study. Included is information on land tenure systems and the degree to which they are adapted to the population modes, structures, and dynamics at the macro or national level. The second section addresses the meso level analysis and thus pertains to the designation of case study areas in which we address the themes explored nationally at a village level. The third section delved into the analysis of similar themes to stage one but at a much more detailed village level where the interactions of the variables became more apparent and more easily disaggregated and articulated. The third stage also incorporates special topics such as the impact of malnutrition and the issue of access to land for the youth and women in society. The fourth stage, based on the findings of the third stage, explores the acceptability of potential changes in the land tenure systems and their likely effects on the local population and also the acceptability of the changes to the local population. The final chapter acts as a synthesis. In writing the final chapter we adopted a case by case method, whereby different scenarios are introduced and

the likely interrelationships between land tenure, food security and demographic change are addressed for the Philippine case.

Chapter 3: Geography of the Philippines

3.1 - Introduction

The Philippine archipelago forms a cultural and ecological crossroads, where Malays, Chinese, Spaniards, Americans, and others have blended to create a distinctive cultural and racial blend in a diverse environment. The archipelago consists of 7,100 islands and occupies an area that stretches for 1,850 kilometers from about the fifth to the twentieth parallels north latitude. Although having a total land area of slightly greater than 300,000 square kilometers only about 1,000 of its islands are populated. Less than one-half of those with permanent residents are larger than 2.5 square kilometers. Eleven islands make up 94 percent of the Philippine land area. Luzon and Mindanao measuring 105,000 and 95,000 square kilometers, respectively represent nearly two-thirds of that area. They, with the Visayan islands represent the three principal regions of the archipelago.

Topographically, the Philippines has one of the longest coastlines of any nation in the world. The Philippines is part of a western Pacific arc system that is characterized by active volcanoes. Among the most notable peaks are Mount Pinatubo near Angeles City, Mayon near Legaspi, Taal Volcano just south of Manila, and Mount Apo on Mindanao. The entire country is prone to earthquakes. In northern Luzon the Cordillera rises to between 2,500 and 2,750 meters. In Northeastern Luzon is found the Sierra Madre which along with the mountains of Mindanao, harbor some of the last remnants of the archipelago's rich tropical forests and cultural minorities. The rain forests also offer prime habitat for more than 500 species of birds, including the Philippine eagle (or monkey-eating eagle), some 800 species of orchids, and 7,600 species of flowering plants. The Philippines is ranked in the top ten nations for species biodiversity and these have a high level of endemism. Population growth and habitat destruction pose a serious threat to flora and fauna (Table n° 3.1).

Table n° 3.1 – Vital Biodiversity Statistics for the Philippines

Hotspot original extent (sq. km.)	300,800
Hotspot vegetation remaining (sq. km.)	21,000
Area protected (sq. km.)	25,995
Plant species	7,620
Endemic plant species	5,832
Terrestrial vertebrate species	1,114
Endemic terrestrial vertebrate species	555
Threatened species	103
Critically endangered species	23

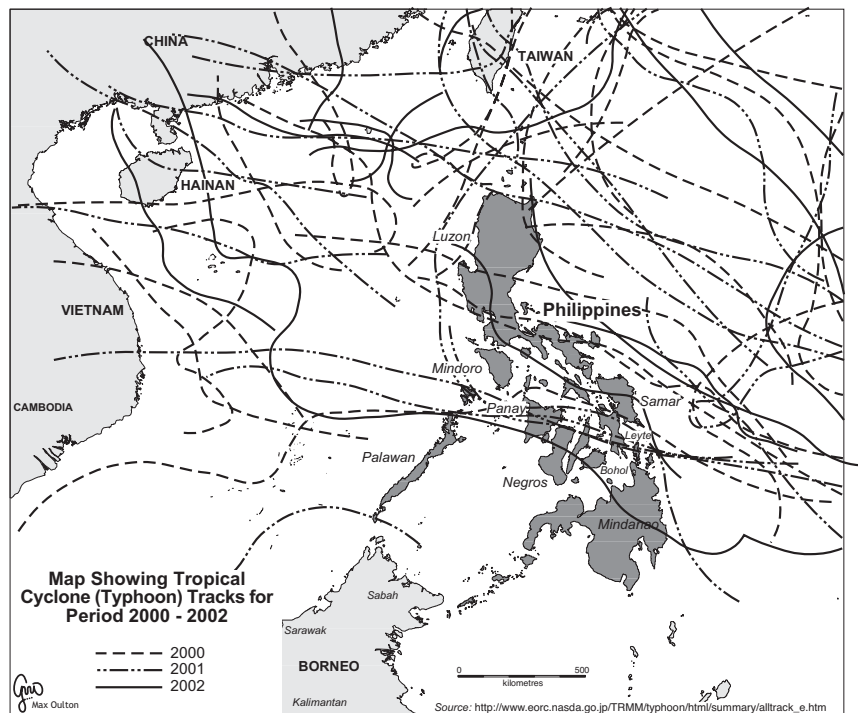
Sources: Conservation International, 2002; Ong *et al.* 2002

The Philippines has a tropical marine climate dominated by rainy and dry seasons. A southwest monsoon brings heavy rains to most of the archipelago from May to October, whereas the northeast or winter monsoon brings cooler and drier air from December to February. Temperatures rarely rise above 37° C. With elevation temperatures can be cool, especially in the mountains of northern Luzon. Seasonal and other longer term perturbations in temperature are minimized in the tropics, however, in the case of the Philippines, there are areal differences in seasonal temperatures. In certain places this is significant enough to affect both the physical and cultural landscape. In the Philippines this variability is derived from latitude, variations in sunshine received owing to cloud cover, continental effects especially in the north and exposure to northeast and southwest monsoonal air masses.

Rainfall is the single most important climatic element in the tropics as it can be highly variable in distribution, intensity and longevity. It is the elements of quantity and seasonality that influence natural plant cover distribution. Similarly, soils have different capacities to transmit moisture through runoff, percolation and leaching and this can have a profound effect on agro-ecosystem

potential as often crop types are chosen to reflect moisture availability.

Figure n° 3.1 – General trend for typhoons passing the Philippines.



Annual rainfall measures as much as 5,000 mm in the mountainous east coast section of the country, and generally between 2000 and 2500 mm in most localities but can be less than 1,000 mm in sheltered coastal areas and some inland valleys. Longer term variability in precipitation across the archipelago occurs with the onset of La Niña and El Niño events. The most problematic are the severe droughts associated with El Niño phases.

Monsoon rains are rarely damaging as they are not accompanied by high winds and seas. However, the Philippines sit astride the typhoon belt and can experience damaging storms in any month of the year. Generally, the most severe storms cross the archipelago from July to October. The eastern and northern half of

the archipelago is most affected with Mindanao generally free from the risk (Figure n° 3.1).

Natural disasters are common in the Philippines and include, as noted, droughts and typhoons. Devastating earthquakes, volcanic eruptions, lahars, and floods can afflict any part of archipelago at any time. Tsunamis are not uncommon and pose a particular risk to a nation with a high proportion of its population located along the littoral. Loss of life in such events can be devastating if little warning is available. Monitoring systems have improved and for certain events such as volcanic eruptions and lahars adequate responses by government have greatly reduced the loss of life.

3.2 - Population growth

The Philippine population continues to grow at a rapid rate, although somewhat reduced from that which had prevailed in the preceding decades. In 2000 the Philippine population was just over 76 million, up from 60 million in 1990. This figure represents an annual growth rate of 2.34 percent, which is a slight increase from 2.32 percent from 1990-1995 but still well short of the 3 percent in the 1960s. At the current growth rate, the Philippine population will increase to an estimated 90.5 million by the year 2010 and could double to 158 million by 2050. Moreover, in 2000 the population was still a youthful one, with 64 percent under the age of thirty. Population density increased from 160 persons per square kilometer in 1980 to 202 in 1990 and 255 in 2000.³ In terms of the arable land area, population density increases substantially. The arable land area was pegged at 52,037 square kilometers in 1980 (population density of 924 persons per square kilometer) and 54,869 (1106 persons per square kilometer) in 1991. The rapid population growth and the size of the younger population has required the Philippines to invest in substantial amounts of social infrastructure.

³ These density figures were based on a land area of the Philippines of 300,000 square kilometers.

3.3 - Migration

There were three significant migration trends that affected population figures in the 1980s and the 1990s. First was a trend of migration from village to city, which put extra stress on urban areas. As of the early 1980s, thirty cities had 100,000 or more residents, up from twenty-one in 1970. Since the 1980s there has been a further explosion of medium-size urban areas. The 2000 census enumerated 97 cities with more than 100,000 people. The National Capital Region's (representing the greater Manila metropolitan area) population was 9,932,560 up from 4,970,006 in 1975. Within the National Capital Region, the city of Manila itself was actually contracting with a negative growth rate of -0.13 percent between 1995 and 2000. However, two other cities within this complex, Taguig and Parañaque, were booming at growth rates of 5.77 and 3.85 percent, respectively.

In many provinces growth of urban provincial capitals has outpaced that of the nation as a whole. For example, Puerto Princesa City in Palawan grew at an annual growth rate of 5.79 percent from 1995 to 2000; Tagbilaran City of Bohol grew at 3.26 percent; Naval in the Eastern Visayas grew at 2.45 percent; Pagadian City in Zamboanga del Sur, Mindanao, grew at 2.97 percent. Therefore across all regions, provincial capitals have become secondary growth poles and form important stepping stones along the path to migration to higher order urban areas and possibly international opportunities.

While the core areas of the more established urban centers (Manila and Cebu) are contracting or are growing much more slowly than in the past, the provinces and cities on their periphery show signs of increasing growth. Mandaue City adjacent to Cebu City grew at a rate of 3.72 percent while the Province of Bulacan near the NCR grew at 4.02 and Province of Cavite at 5.99 percent. Within the Province of Cavite the city of Dasmariñas grew at a rate of 10.75 percent between 1995 and 2000 making it the fastest growing city in the country, followed close behind by Trece Martires City, also of the province of Cavite at a 10.25 percent growth rate.

It is now very clear that beginning in the 1980s, the Mindanao frontier ceased to offer a safety valve for land-hungry

settlers. Even the peaceful provinces of the pre-1980s became dangerous places where Philippine army troops and New People's Army insurgents battled each other and with bandits, 'lost commands', millenarian religious groups, upland tribes, loggers, and Muslims. Population pressures also created an added obstacle to land reform. Demands increased to restructure land tenure so that landlords with large holdings could be eliminated and peasants could become farm owners. Land reform is resisted by landlords. By the 1990s there simply was not enough new land to enable a majority of the rural inhabitants to become landowners and hence pressure on large landholders increased (Jackson 1992). International migration offered better economic opportunities to a number of Filipinos without, however, reaching the point where it would relieve population pressure. For example, the number of Filipinos in the United States reached 1,406,770 according to the 1990 United States census.

In addition to permanent residents, in the late 1980s and 1990s, more than half a million temporary migrants were working abroad but maintained a Philippine residence. These people continue this trend of outward temporary migration to work in the Middle East, Hong Kong, Singapore, and increasingly Europe, Australia and New Zealand as well as the United States. The remittances sent back to the Philippines by migrants have been a substantial source of foreign exchange.⁴

3.4 - Society

Philippine society continues to be relatively homogeneous even though they are dispersed across 1000 inhabited islands. Muslims and upland tribal peoples are the exceptions, but approximately 90 percent of the society is united by a common cultural and religious background. Language forms one point of internal differentiation, but there is regular intermarriage across

⁴ A report in the Singapore Straits Times (November 23, 2002) noted that remittances were expected to reach \$US 8 billion in 2002, a 22.6 percent increase from 2001. A report in the Manila News Daily (November 24, 2002) noted that this total represented nearly 10 percent of the nation's GDP. Considerable economic risk stems from such dependence on foreign capital in times of political, military and economic uncertainty internationally.

linguistic lines. With political centralization, urbanization, and increasing internal migration, linguistic barriers are rapidly eroding. There is also a government emphasis on the national language of Filipino. The widespread use of English has also eroded some local dialects. Still the language spoken in the home is often different than those defined by government or the media and this has resulted in the maintenance of linguistic diversity.

Filipinos are a variety of mixes of Malay, Chinese, Spanish, Negrito, and American. Negritos were some of the earliest inhabitants, followed by Malays, who were responsible for the development of lowland agriculture. With the spread of the Malay population through the archipelago certain growth areas emerged and grew outward. The Cebuanos of the Central Visayas expanded out to Leyte and south to Northern Mindanao and the Ilocanos spread along the west coast of Luzon, while the Tagalogs spread out from southern Luzon. With each group a distinct vernacular developed. The arrival of Islam in the southern Philippines during the fifteenth century resulted in the establishment of sultanates in southwestern Mindanao and the Sulu Archipelago with contact with the rest of the archipelago.

Spain colonized the Philippines in the sixteenth century. This proved to be a homogenizing force and set the scene for the development of a Philippine national identity but not all areas were converted to Catholicism (notably the Muslim areas of the Southern part of archipelago and some upland tribal groups). The Spanish influence was strongest among lowland groups and emanated from Luzon and the Visayas.

3.5 - Agricultural geography

The present agricultural economy of the Philippines is reflective of a complex mix of several cropping systems, numerous land control systems, localized labor systems, and differentiated trade, exchange and consumption systems. Several systems in use today date back to the time of European contact and earlier. The first system and one still used in a highly modified form was caingin or slash and burn shifting agriculture. Crops cultivated in the caingin system included rice, yams, and bananas which were the staples and,

minor crops such as coconut and sugarcane were used as supplements, with gathering in adjoining forests complimenting the diet along with hunting and fishing. There is some dispute over the extent of wet rice cultivation at the time of European contact. Certainly the world famous rice terraces of northern Luzon pre-date European contact and there are references to rice cultivation in the Western and Central Visayas at contact (Alzina 1668; Lopez 1967; Conklin, Lupaih *et al.* 1980). The one crop that is ubiquitous today that was not present at contact was maize (Spencer 1975). The Spanish introduced several new elements into the Philippine cropping system, maize being the most important. Other new crops included sweet potatoes, manioc, agave, pineapple, a number of fruits and varieties of livestock, especially horses and cattle. They also introduced new land controlling systems and social structuring such as the hacienda or large landholding system.

Today five crops form the base for all regional patterns of agriculture in the country: rice, corn, yams, sweet potatoes, and bananas as staple crops, supplemented by coconuts as an enduring cash crop. Rice and bananas are a common combination across the archipelago. Regional specialization results in one or more other crops being added to the rice/banana base and when agglomerated can constitute significant hectares and play an important role in the regional economy.

Climatic conditions are a major determinant of crop production patterns. For example, coconut trees need a constant supply of water and do not do well in areas with a prolonged dry season. Sugarcane, on the other hand, needs moderate rainfall spread out over a long growing period and a dry season for ripening and harvesting. Soil type, topography, government policy, and regional conflict between Christians and Muslims were also determinants in the patterns of agricultural activity.

3.5.1. - Intensification and extensification of landuse

Another inevitable response of agriculture to increasing population pressure is the more extensive and intensive use of land for cultivation. The figures on farm area, average farm size, and

number of hectares and parcels per farm to be discussed in the next chapter illustrate the ongoing processes of agricultural ‘intensification’ and ‘extensification’.⁵ A more explicit and convenient measure (Xenos, 1998:51) can be used to demonstrate this point with better clarity.

The procedure decomposes population density into different components as follows:

$$= \frac{\text{population}}{\text{cultivated hectares}} \times \frac{\text{cultivated hectares}}{\text{farm hectares}} \times \frac{\text{farm hectares}}{\text{total hectares}}$$

Let the ratio of population to cultivated hectares represent ‘physiological density’ (Table n° 3.2). The ratio of cultivated hectares to farm hectares represents the ‘intensity’ of use of existing farmlands, while the ratio of farm hectares to total hectares represents the ‘extensiveness’ of the use of available land in the country.

⁵ See Richard Jackson’s paper (1992) for a more comprehensive assessment of change.

Table n° 3.2 – Agricultural components of population density: 1960-1991

Year	$\frac{\text{Population}^a}{\text{Cultivated Ha.}^b}$	$\frac{\text{Cultivated Ha.}^b}{\text{Farm Ha.}^c}$	$\frac{\text{Farm Ha.}^c}{\text{Total Ha.}^d}$	$\frac{\text{Population}^a}{\text{Total Ha.}^d}$
1960	4.854	0.718	0.253	0.881
1971	5.710	0.756	0.276	1.193
1980	6.124	0.808	0.316	1.564
1991	6.386	0.953	0.324	1.974

a. As reported by the National Statistics Office (NSO), 1999 Philippine Yearbook, Table n° 5.1.

b. Land planted to temporary crops and permanent crops. Source: 1991 Census of Agriculture: Philippines, Table A.

c. Total area of all farms reported. Source: 1991 Census of Agriculture: Philippines, Table A.

d. Total land area of the Philippines (30,747,769 hectares), updated as of 15 December 1996. Source: National Mapping and Resource Information Authority (NAMRIA).

Given the limitation of census data, ‘cultivated hectares’ is here defined as the total number of hectares planted to temporary or permanent crops. Total ‘farm hectares’ would include, in addition: farm area lying idle (temporarily fallowed or used as meadows or pastures); permanent meadows and pastures; farm land covered with forest growth; and, all other lands (including homelots). Population figures used in the computation are those reported in the censuses of 1960, 1970, 1980 and 1990.

The ratios reflect the levels and the rates of landuse intensification as well as extensification for the period 1960-1991. It can be seen that the proportion of all land used for agricultural purposes has risen from 25.3 percent in 1960 to 32.4 percent in 1991 (growth of 28 percent). As stated earlier, the extent of land that can be used for cultivation is constrained by several factors, including

topography, geological factors, climate, and even public policy. The proportion of cultivable land in actual cultivation has increased as well, and even more markedly so: from 71.8 percent to 95.3 percent (growth of 23.5 percent). These increases suggest that agricultural expansion in the country from 1960 to 1991 has been dominated by more intensive use of existing farmlands rather than by the opening up of new agricultural lands.

Because ‘intensification’ seems to have nearly reached its limits—barring the use of better technology—one can probably expect ‘extensification’ of agriculture to proceed at a faster pace in the future, unless this too is close to its limits.⁶ Grave concerns over the continuous migration of farmers into the uplands and forest reserves, and recognition that this condition is unsustainable and indicative of a crisis, signify that even here the limits are imminent as well.

3.6 - The dominant grains

In this section we introduce the dominant grains under widespread cultivation throughout the archipelago. The basis for the Charter and the Philippine’s inclusion in the worldwide study was its dependence on grain production and lack of capital reserves or trading relationships that could permit it to import large quantities of grain in the future to feed a growing population. Details on productivity and specific areas of dominance in the production of grains and other important agricultural products such as coconut, bananas and root crops is left for the following chapter.

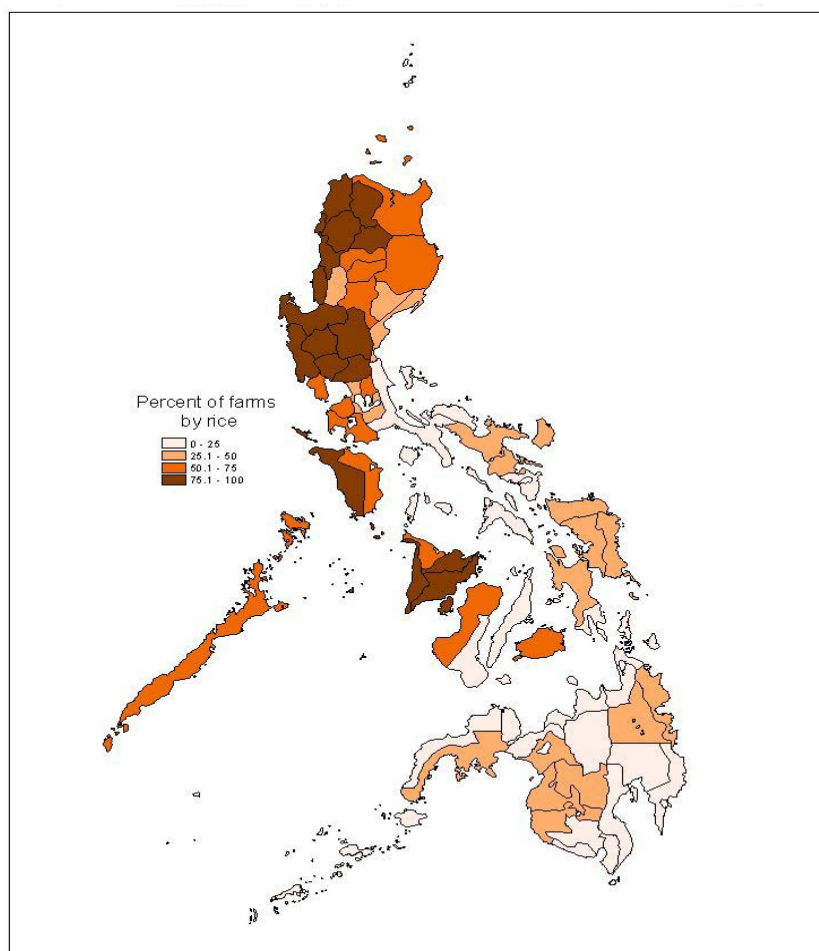
⁶ Richard Jackson (1992:10) commented “there remains no unclassified land [in the Philippines]. Extension of agriculture can now only occur as a result of squatting on lands classified for non-agricultural uses or of the reclassification of land”.

3.6.1 - Rice

Rice is the traditional staple crop of the Philippines and is central to the rural agricultural economy. The crop is grown on over half of all the farms in the country and is grown on more farms than any other single crop. Rice covers nearly half of the cultivated area of the country but is the food staple for about three-fourths of the population, many of which eat rice at least once a day. Even though rice is suited to growing in most areas of the Philippines, from low lying to high elevations and from wet to dry areas, its primary production areas are regionalized (see Figure n° 3.2). The Central Plain of Luzon is the largest regional producer, but Mindanao until the last decade, was the largest surplus producer. Southwestern Luzon, Eastern Panay and the Bicol Peninsula are also important production areas while islands such as Bohol, Leyte and the Cagayan Valley of Luzon form secondary production areas. While corn production is critical in Mindanao rice is also cultivated across the island but no single area is as important as those noted to the north.

In the Philippines there are few areas for rice production that are restricted by environment. Temperature is suitable across the archipelago except in the most elevated portions of the islands and on the upper slopes of the many volcanoes where there is too much cloud cover for effective production. In other areas that might be deemed marginal owing to moisture restrictions (either too much or too little) this is adapted to by planting rice in wet or dry seasons and/or by providing irrigation. Importantly, the full concept of irrigation is important to the wetter areas of the archipelago whereby irrigation is not only the provision of water to cultivated plants but also the removal of excess water after heavy rainfall events.

Figure n° 3.2 – Percent of farm area planted to rice by province, 1991



The application of technologies to improve rice yields in the Philippines has been slow. The exception to this has been the application of green revolution technologies (seed and fertilizer mainly). However, for such technologies to reach their full potential other technologies such as soil and water management must also be applied. In the Philippines the application of the whole suite of technologies has been patchy and thus the Philippines still has one of the lowest national rice yields per unit area under cultivation of any country in Asia. In fact, in the Philippines any gains in national

production in the last three decades have been achieved more by expanding the area under cultivation than through *in situ* increases in production (Bouis 1993). The Philippines began importing rice in the later nineteenth century (Wernstedt and Spencer 1967) and rice imports to balance production shortfalls have been the norm ever since.

Most rice farms only produce one crop per year in the wet season. This is especially the case where irrigation is deficient or non-existent. Rainfall is held on the land through the provision of bunds or small dikes. The risk of water deficits is high and rainfall variability can have a marked effect on yield on a year to year basis. Two crops of rice can be produced in areas with indigenous irrigation technology, which has been in place, in some instances, since the pre-European period. Other areas have been provided with irrigation infrastructure more recently through government programs which require damming of rivers and streams at both large and small scale. The areas easily irrigated have been serviced. What remain unserved are small, isolated areas with potential for further irrigation development. There are no new potential sites for the development of either large scale or small scale rice production i.e. all the land with potential to grow lowland rice has been exploited and that still possible for cultivation of upland rice is extremely fragile. In actuality, the area available for rice production is in decline as urbanization swallows up large areas of reasonable good rice land in Luzon. There is also the problem of destabilization of island hydrologies that undermines the provision of stable supplies of irrigation water and leads to field conversion from wet rice cropping to other cropping patterns, typically corn-based (Urich 1996a).

3.6.2 - Corn

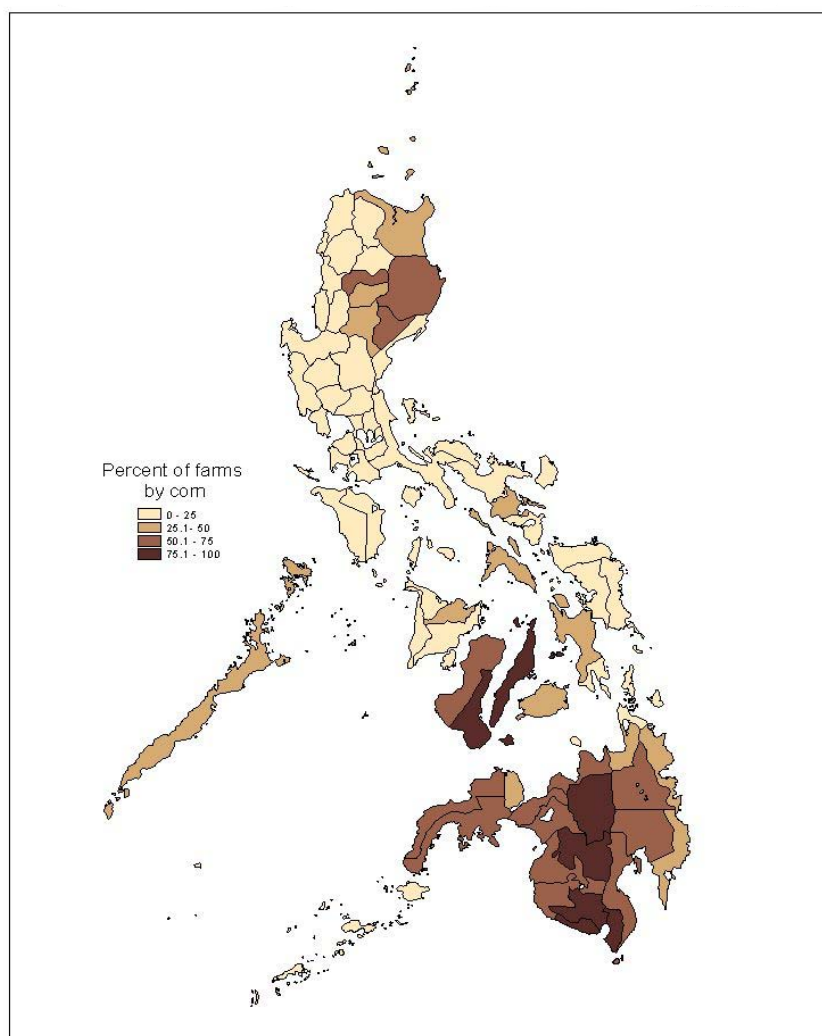
As Phelan (1959) noted, corn was introduced to the Visayas in the sixteenth century and then spread from there to the rest of the archipelago. It is known in the Philippines as *mais* and although slow to be accepted by cultivators it has since grown to be an important crop and is highly adaptable with its cultivation supplementing rice and tuber crops. It grows reasonably well in

slightly drier environments surrounding lowland rice fields or on the slopes of hills. It has gained regional dominance where rainfall is sporadic and wet seasons can fail with some regularity and also where soils and slopes are conducive to corn rather than rice (Figure n° 3.2). The island of Cebu is one such island with its steeply sloping lands and limestone soils. Much of Mindanao is also conducive to its cultivation with its mountainous terrain and limited lowlands and lack of a wet rice tradition. Many settlers of Mindanao originated from the corn growing provinces of Cebu, Negros and Bohol in the central Visayas and they continued their cultural practices of corn production and consumption in Mindanao.

Corn, like rice can be grown anywhere in the Philippines (Figure n° 3.3). In areas with year around precipitation up to three crops a year can be grown but in areas with more seasonal rainfall cultivation is limited to the rainy season. Both 'local' and improved varieties are widely cultivated. A white corn is most commonly grown as it is dried and mashed and cooked with rice to form a 'corn rice' concoction for the table. Disease and pestilence is an ongoing problem with corn production, and yields may decline markedly in subsequent plantings of corn on the same plot. The rotating and resting of fields is a common practice but as population pressures increase and land areas per farm family decrease the ability to fallow land for extended periods is decreasing. Hence corn yields are in rapid decline. Provision of improved seed varieties is being attempted but they require a whole host of other inputs to reach their professed potential and these are often expensive and out of reach of many small scale cultivators.

A primary corn producing area surrounds Davao Gulf in southern Mindanao. Production from this area supports the corn deficit area of the Visayas. A number of secondary production areas include the Cagayan Valley of Luzon, the Batangas Peninsula of

Figure n° 3.3 – Percent of farm area planted to corn by province, 1991



southwest Luzon, the Sorsogon Peninsula of southeastern Luzon, eastern Panay island and a wide area of western Mindanao. In the immediate post-World War Two era the Philippines was self-sufficient in corn. From the 1970s onward and as more corn has been channeled to livestock feeds rather than human consumption deficits have occurred and imports have increased. The potential for

a return to self sufficiency is not foreseen as marginal areas further decline in land quality from over exploitation and the areas available for colonization and cultivation of corn rapidly diminish (Jackson 1992; Kummer, Concepcion *et al.* 1994).

3.7 - Social development and control of land

Land tenure status and relationships between landed status and economic, political and ecological issues are gaining wider prominence in the development literature (Putzel 1990; Thiesenhusen 1991; Friedmann 1992; Ward 1992; Suhrke 1993; Marks 1994). As a bi-product of colonialism, land tenure systems have been formalized not only by colonial overlords but also by regimes of so-called free and independent states. Codification of land holdings in the Philippines through the issuance of titles and clear and unencumbered ownership of property has been deemed a necessary part of the development process, as it had been in western 'developed' states for some time (Miller and Storms 1913). Thinking in this regard remains little changed with, for example, Indonesia currently pursuing broad and far reaching land registration programs, although not without considerable debate in the academic community (Ward 1995).

In the Philippines, rural land tenure reform and concomitant productivity increases have been portrayed as being essential to urban industrial development. However historically, its implementation appears to be driven by the need to reduce social conflict rather than as a method of facilitating economic growth and positive social change (Kerkvliet 1979).

Philippine government policy in the area of agrarian reform has been labeled as 'abusive'; a 'failure', 'watered-down', 'inefficient', 'biased', 'impotent', 'corrupt' and 'conservative' (Kummer 1992; Lim 1995; Mangahas 1986; Putzel 1992). With the overthrow of the Marcos regime in 1986 and the ascendancy of Corozon Aquino and the writing of the 'New' constitution of 1987 hopes rose for the formulation and implementation of a more 'comprehensive' agrarian reform policy. Aquino's discretion in not pushing forward a program of reform when she held relatively unlimited law making powers under the Freedom Constitution

stretching from March 12, 1986 to July 27, 1987 has been questioned (Romero, *et al*, 1991). Reform remained high on the political agenda with strong pressure being exerted on the State by an increasingly militant peasantry exasperated with rising landlessness and the increasing concentration of land in the hands of a relatively few powerful élite. Land take-overs—peasants seizing and cultivating land owned by holders of large tracts of land—were occurring with more frequency (Kerkvliet 1993). The Philippine Government responded to this ‘threat’, but in an unexpected manner; they granted many small parcels of land to peasant farmers from the stock of publicly held resources. The release of these lands had severe ecological and hence social consequences that are being played out today (Urich, *in press*).

In the Philippines the study of resource exploitation, the way people gain access to the means of production, is important because historical patterns of political and social organization have strong contemporary correlates (Scott 1991). “Slavery and bondage were ubiquitous and significant in Philippine life. In the practice of agriculture, terms distinguished the division of labor, not of property” (Scott 1991:15). Social differentiation and cultural interdependence were the hallmarks of Philippine social organization both before and during Spanish occupation.

Only very recently have some institutions dating to pre-Spanish times been undermined. Their longevity is important given the pressures for change occurring around them. Oral histories and Spanish reports tell of a system of land claiming in the resource-rich lowlands whereby an individual interested in a piece of unencumbered (uncleared) land simply laid claim to it by initiating clearing and cultivation. By continuing to cultivate or by investing—in the case of dry lands—in perennial plantings of fruit trees and coconuts, the land was deemed occupied and counter-claims could not be made to it. Writing of the Visayas, Alzina (1668) outlined cases where land was claimed, cleared and, on the boundaries, fruit and other economic trees were planted. Lands were then abandoned, yet the trees remained. After a number of years, the original claimant could then return and ‘re-claim’ the land

which was marked by the fruit bearing trees on the boundary.⁷ There was an unwritten understanding between villagers that a piece of land with conspicuous plantings of fruit trees had been claimed.

Similarly, by cultivating or by investing in *landesque capital* (irrigation canals, terraces) and by maintaining the investment on a lowland property it could be held in perpetuity. Clearly, areas of wet lowlands must have been under a traditional tenure system. Without secure tenure farmers would not have been interested in investing such amounts of time and energy in constructing very durable stone terraces and extensive irrigation systems.

Basins were more easily defended as being rightfully owned due to the tradition of extending use rights from the valley floor to the summits of surrounding hills. Today's more affluent families are often the descendants of relatives who claimed more expansive areas of land. Their ancestors cultivated the lowlands and realized their excellent agricultural potential. By distributing the surplus harvest they attained status and also expanded the area under their control. Peripheral and less powerful families were supported by the *élite* in return for their assistance in cultivating the land. These less powerful families had self-interest in improving the land. By investing their labor in the construction of *landesque capital* they improved their share of the harvest and household food security. They also had a relatively secure existence. However, over the long term more benefits accrued to the dominant families.

The permanency of wet rice cultivation and the investment in *landesque capital* involves a formalized traditional land holding system. These lands were highly valued and were not abandoned or distributed as compensation payment. In contrast, the dry cropped lowlands in most of the interiors of the islands have been only permanently settled in the last 100 years (with the notable exception of the interior of Luzon with its ancient rice terraces and some other

⁷ Alzina described the system thus, "Formerly, they (Visayans) readily yielded to him who came first (the right) to select (his land) and much more to him who planted first his coconuts, trees, fruits, abaca, and other things. They have always a right and dominion over their [land] even though they may affirm that they may go to live in another village" (Alzina 1668:82).

island interiors). Still they too are becoming highly valued lands as more permanent crops, such as coconuts and economic trees, are planted. This very rigid situation prevailing in both the wet and dry lowlands is markedly different from that operating in the extensive uplands.

Uplands, like the lowlands, were claimed by individuals. A person claiming an area of the lowlands was, by tradition, recognized as the claimant of all the upland from the point where lowland met the upland, and then extending to the hill's summit (Urich 1989). This system still applies in lands being claimed today on the now slowly expanding frontier.

Summits and slopes of hills, either gently rounded or in some instances quite flat, were cleared and cropped. In these instances use rights were customarily recognized. In many cases cultivation was not feasible and these cleared and generally grass-covered areas were used by the community as a common property resource. Writing on the land holding system at Spanish contact, Bernad (1972) commented on the presence of formalized individual holdings for lowland plots and communal use of the summits of hills. Indeed, many of the uncultivable hills are still being communally managed.

In summary, two regimes have been in place regarding the usufruct rights to land. One is exclusive to the lowlands, and the other—widely recognized within society as *de facto* ownership—involves communal pasturing or cultivation in the uplands.⁸ This dichotomy is not unexpected. Historically, value has been placed on lowland resources as demonstrated by the investment in irrigation structures like canals, terraces and field bunds. Control of lowland resources and a surplus of rice enhanced the power of the family which originally claimed the land. These patterns, established in this earliest phase of local history, mark the patron-client relationships of today.

⁸ Lowland in this instance refers to flat land which may be found at any elevation i.e. including plateaus within island interiors. Uplands refer to sloping lands surrounding lowland areas and may be anything from small localized hills to mountain ranges.

3.8 - The American Period

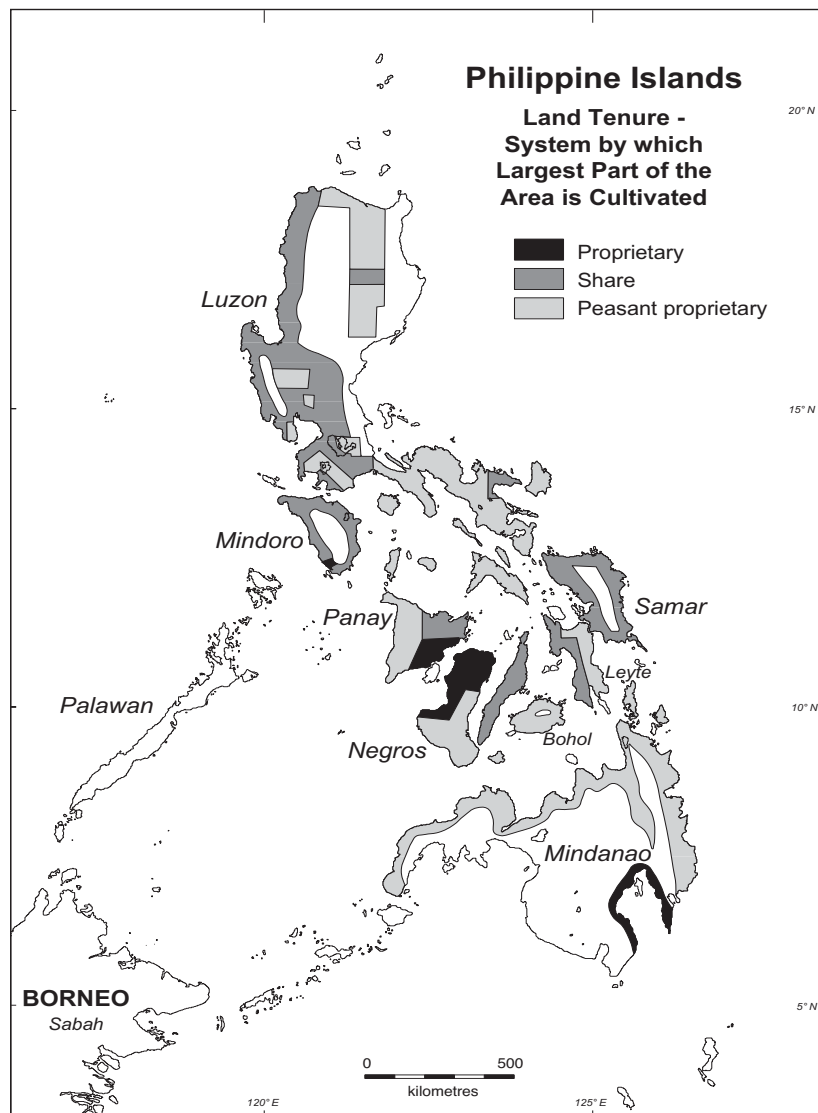
Early in the American period it was recognized by the new colonial masters that rights to land in the Philippines changed with some regularity. These changes were also not always complete in that they could be recognized as custom, inheritance, law or contractual and could extend from one cropping cycle to any number of years or for a certain amount of the product of the land. The land holding systems for the larger parcels were defined by Miller and Storms (1913) as either proprietary, share or rent systems. The smaller parcels were cultivated by either peasant proprietors, hired labor or on a sharecropping basis.

The proprietary system was based on an owner operating a farm either directly or through the use of a manager. Laborers worked on the farm for a wage and were supervised by a foreman. The sugar haciendas were the best example of this type of system. A derivative of the proprietary model was the 'peasant proprietary system'.⁹ This was based on land 'owners' tilling their own land, and was most common in long-settled areas, and where there was a "wide distribution of wealth" (Miller and Storms, 1913:184) or where new land was being opened up for cultivation. Importantly, in the proprietary and peasant proprietary systems the owners actually tilled the soil (or supervised its tillage) and they were the only ones interested in the crop. Moreover, they owned the land and had sole use of the soil.

In contrast to the above systems, Miller and Storms identified an emerging rent system, which was already widely used in Europe and the United States. Under this system a person could obtain temporary rights to the total product of the land by paying a stipulated sum or an amount of production to the actual land owner. Miller and Storms found this rental system widespread in the Central Plain of Luzon, Mindoro, Panay and Leyte, among other regions (Figures n° 3.4 and n° 3.5).

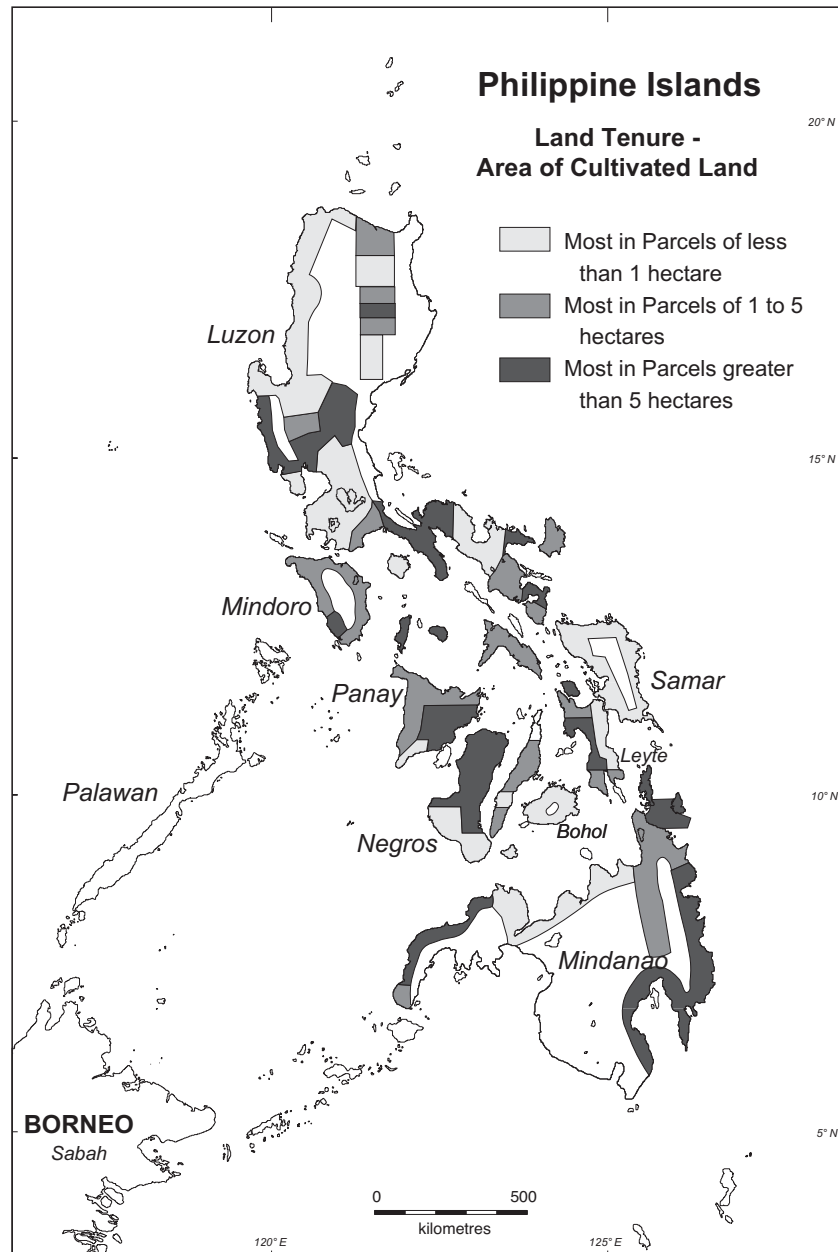
⁹ Others in the Philippines included a 'proprietary system' (hacienda) and 'share system'.

Figure n° 3.4 – Land tenure systems in place in the early twentieth century



Source: Miller and Storms 1913

Figure n° 3.5 – Size of parcels in the early twentieth century



Source: Miller and Storms 1913.

In the systems described thus far the cultivator of the land is the only person directly interested in the amount of the crop. Another system differs in this regard and Miller and Storms termed this a 'share system' whereby the owner and tiller of the soil are both directly interested in the size of the crop produced. In some regions the tiller was relatively free to cultivate the land as they desired. In other regions the landlord held considerable control not only on the direction of land cultivation and development but also in family and everyday activities. Miller and Storms also described a Manorial system which was also a share system. Three subclasses of share system were identified by Miller and Storms.

- 1] large haciendas cultivated on a share system, known as the *kasama*, *kanan* or *inquilino* systems;
- 2] a system whereby a large number of scattered plots were owned by one person and leased to tenants – the scattered land holdings system, and;
- 3] leasing and re-leasing by peasant proprietors—the interleaving system.

Clearly there is some historical basis for the evolution of considerable complexity in the land holding systems encountered by the new American colonial regime in the early 20th century.

Regardless of this complexity, in the first century of the United States colonial administration, a series of land laws was promulgated to supersede any customary land holding system. A flurry of regulations pertaining to the formalization of land rights was enacted and first adopted by the Christian lowland cultures of the archipelago.¹⁰

The motivations for the establishment of a formal land titling system were diverse and often contradictory. First, as part of the Treaty of Paris signed in 1898 that ceded the Philippines to the US

¹⁰ Christian lowland cultures refer to those generally sedentary cultures that had adopted Catholicism. The term 'lowland' in this case in no way refers to an agricultural system, meaning lowland or wet rice-based system. It is used to refer to linguistic groups commonly residing at the coast and in the foothills of the archipelago's larger islands.

from Spain, it was stated that existing property rights of private establishments, the church, and individuals, had to be respected. Secondly, the method of land registration was modeled on the homesteading system used in the settlement of the American west. An underlying motive of the American regime was to bring about an agricultural middle class (Miller and Storms 1913).¹¹ The US administration envisaged that the creation of ‘independent farmers’ would result in the type of citizen who, because of their investment in land, would have a greater interest in government and thus ensure the survival of democratic principles. Furthermore, economic development would take place, as farmers—through the formation of an independent agricultural middle class—became consumers. It was thought that consumerism would raise the interest of farmers in not only the quantity, but also the quality of crops (Miller and Storms 1913). Moreover, “the homestead laws, the activity looking toward the settling of land titles, and the agitation for lower interest, *all have in view the extension and protection of the peasant proprietary class*” (Miller and Storms 1913:213) emphasis added.

The first legal act passed by the United States in the Philippines was the Cooper Act in 1902, also known as the Philippine Bill. It legitimated and empowered Philippine civil government to legislate land laws. Civil government ruled that land could be granted or sold to actual occupants or settlers, or any other Philippine citizen, as long as the area did not exceed 16 hectares per individual, or 1024 hectares for a corporation or ‘association of persons’. Following closely after the passing of the Philippine Bill was the more comprehensive Public Land Law of 1903 that took effect on July 26, 1904. Act No. 926 as it was known, clarified and expanded upon the provisions of the Cooper Act. Regulations were put in place governing homesteading¹², selling and leasing of lands in the public domain, issuing local patents to native cultivators of

¹¹ Hugo Miller, an American, was the Head of the Philippine Department of Industrial Information. Miller and Storms’ book on the economic conditions in the Philippines in the early 1900s included extensive accounts—and policy statements—on land tenure systems, agricultural labor and food crops.

¹² Homestead claims were initially limited to 40 hectares but were increased to 144 hectares in 1924. Between the years 1906 and 1911 only 1400 homestead claims were made in the entire Philippines (Miller and Storms 1913:214).

public lands, settling disputes over imperfect titles, and making provisions for the leasing or renting of public lands by United States or Philippine citizens, and corporations.

To facilitate the provisions of the Public Land Law a Public Lands Division was created in the Insular Bureau of Public Lands. Soon after, a Court of Land Registration was created where Torrens titles could be applied for upon establishment of one's 'ownership' over a parcel of land. Developed in parallel with the Torrens land titling system was a bureaucratic system for defining areas and landuses of individual plots for the purpose of taxation. In lieu of a Torrens title, a person could apply for a tax declaration. Although areas are computed for taxation purposes, specific measurements and vectors are not shown on the document in the same way as they are on a Torrens title.

A Torrens title was meant to be the only legal form of ownership recognized by the Philippine judicial system. To discourage use of tax declarations for this purpose there is a disclaimer printed on every tax declaration "not to be used in the settlement of legal cases". Yet throughout the Philippines many land disputes are settled in a court of law on the basis of a tax declaration. Legally occupied lands were therefore registered under two systems: tax declaration, and tax declaration plus formal Torrens title.

Original ownership was established by proving that one had been cultivating the land in question for three years prior to the date of application. While refinements of these laws occurred through the decades leading up to World War Two, the Cooper Act and Public Land Law of 1903 had set precedents that still apply today, to a large degree.¹³ These land laws were swiftly interpreted by certain sectors of society.

¹³ See Putzel (1992) for a detailed review of the role the United States played in development of land laws in the Philippines.

3.9 - Republic Act No. 6657 – 1988 Comprehensive Agrarian Reform Law

A long series of land reform initiatives have been promulgated for the Philippines. Reforms have had similar rhetorical names to Comprehensive Agrarian Reform, such as President Quezon's 'Social justice program'; Magsaysay's 'Land tenure act'; Macapagal's 'Land reform code'; and, Marcos' 'Land reform decree'.

It is a policy of the State to pursue a Comprehensive Agrarian Reform Program (hereafter CARP). The stated intent is that welfare of the landless farmers and farm workers will receive the highest consideration in order to promote social justice; to move attention towards sound rural development and industrialization; and, establish owner cultivatorship of economic-sized farms as the basis of Philippine agriculture. However, tenancy rates in the countryside range from 50 to 70 percent. Just like other marginal farmers, tenants—whether sharecropping or leasehold—have to contend with a rural élite which not only enjoys a monopoly in land resources, but also controls the distribution of technological inputs, rural banking, the renting out of farm machinery and the storage, transportation, processing and marketing of farm produce. Taken as a whole, marginal farmers, tenants and farm workers total 10.2 million, 70 percent of whom are landless. The Comprehensive Agrarian Reform Law (CARL or RA 6657) was passed in 1988 to change this situation. With an allotment from the Congress of about P 50 billion (US\$1.92 billion), the ten-year law has a remaining balance of P4.91 billion (US\$0.18 billion) to date. However, distribution of lands to the tillers is below the expected targets and may not be accomplished during the last year of CARP. After a quarter of a century, from 1972 to 1996, the government distributed a cumulative total of 2.56 million hectares or 60 percent of the planned allocation of 4.3 million hectares.

Debate on the social, economic, and more recently, ecological ramifications of inequality in Philippine land ownership is polarized. Dominant, and on the right, are the conservative legislators with landed interests. Opposing them are the liberals, including foreign aid agencies and segments of the Philippine NGO

movement. Peasant militants and some NGOs take a more radical stance and see a revolutionary approach as the only way forward (Putzel 1992; Broad and Cavanaugh 1993). It is the militants who persistently focus on the issue of the concentration of land ownership and who have steered debate to the left by drawing attention to the government's continuing inability to formulate a more widely acceptable land reform policy, and to carry that policy through to implementation.

An opportunity to address past grievances was not taken by the Aquino regime (Putzel 1992). Subsequent government policy on the redistribution of land—written and passed by land-owner controlled Congresses—has permitted the large areas of public land to be legally occupied and cultivated. This policy was formulated in a period of increasingly vociferous and militant armed uprising (Jones 1989). The 'classical' counter-insurgency strategy involved suppression of dissidents and allocation of public lands on long-term leases to particular groups (Dillon 1995; Magno and Gregor 1986; Pugh 1987; Urich, *in press*).

CARP's primary objective was to wipe out 'rural poverty and communist insurgency by removing the root causes of landlessness spreading across the archipelago'. The use of the term 'comprehensive' gives the impression of something unprecedented in the area of land involved and number of potential beneficiaries. Areas subject to reform, paradoxically, extended to environments which under Philippine law were outside CARP's jurisdiction as they were legally classified as restricted from occupation for a number of reasons. For example, Executive Order 229 stated that all types of land, agricultural land, urban land, and other lands of the public domain, were subject to the laws of comprehensive agrarian reform. Of interest to this study was the inclusion, also within Executive Order 229, of public lands with beneficiaries determined by the DENR in conjunction with the DAR.

At least two laws should have served to restrain the distribution of at least some if not all of these 'public lands'. RA 66547 explicitly states that parks, forest reserves, reforestation sites, fish sanctuaries, breeding grounds, watersheds and mangroves could not and should not be released for occupation, i.e. cultivation. This

was reinforced by the wording of the Law of Agrarian Reform which noted that for the sake of ecological balance, land reform would apply 'to public lands and other natural resources only when it would preserve and not adversely affect national parks or other preserves such as endangered forests'. Section 51 of Presidential Decree No. 705 of the Forestry Reform Code of the Philippines is more specific. 'Any occupation in forest land that will result in sedimentation, erosion, reduction in water yield and impairment of other resources to the detriment of community and public interest shall not be allowed' (La Viña 1991:143).

3.10 - Summary

The geography of the Philippines is fragmented and along with this fragmentation has come divergent development that reflects local resource potential and varying social and political agendas. Generally, land tenure systems are diverse and have a long historical legacy that has been little changed through time in spite of marked intervention in land holding policy. More recently, from 1960 to 1990, during the period of the latest population explosion the number of farms in the country has more than doubled. However, the total farm area increased by only 28 percent. Consequently, the average farm size has decreased over these decades. There are indications of rapid fragmentation of agricultural land in the country, even as the majority of farmers own, in full or part, the land that they are farming. There has been more 'intensive' and 'extensive' use of land for agricultural purposes. There is a demand for new land to cultivate but the land frontier has effectively closed with almost all subsequent lands opened for agriculture being located in conservation and watershed protection areas. Thus, any new land formally approved for cultivation is likely to come through the reclassification of public, protected lands. The following chapter reviews the population dynamics that relate so strongly to the systems of land use and holding described thus far at the macro level.

Chapter 4: The Philippine Population

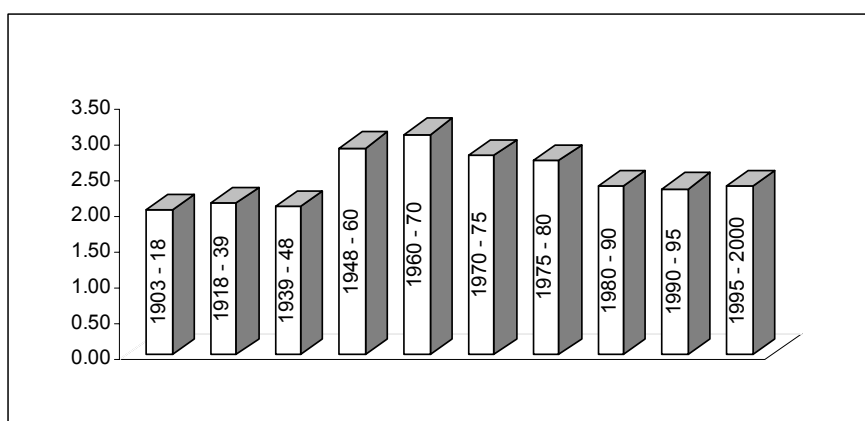
4.1 - Historical background

Before the census of 1903 only a sketchy outline of Philippine demographic history existed. The 1903 Census Report (United States Bureau of the Census 1905) states that the earliest estimate of the Philippine population, made at the time of Legaspi's conquest of the Islands around 1570, was about half a million. By 1591 there were some 668,000 people in the archipelago. With an annual growth rate of around 0.41 percent, the population reached 1.6 million in 1800 (Doeppers and Xenos 1998). In the 19th century population growth had accelerated to over 1.7 percent increasing the population 2.5 times from 1800 to 1850, and 4.5 times before the turn of the century, and before the mortality crises that resulted from the cholera epidemics, the 1896 Revolution, and the Philippine-American War. Faster acceleration of growth took place in the next century reaching a peak of 3 percent by the 1960s. It is therefore said "the Philippines' population has exploded in two distinct phases, from the late eighteenth century to circa 1875 and from 1905 to the present" (Doeppers and Xenos 1998:4).

In the report of the 1995 Census of Population, the Philippine National Statistics Office (NSO) traced population size from 1903 to 1995. In this span of time the country's population grew from 7.6 million to 68.6 million (NSO 1997). As Flieger (1996: 209-210) noted, the 20th century saw a doubling of the population three times: "from 8 million at the beginning of the century to 16 million at the start of World War Two; then from 16 to 32 million between World War Two and the mid-1960s, and to approximately 65 million shortly before the end of the century".

The growth trend of Philippine population in the last century is depicted in Figure n° 4.1. Annual growth rates stood at around two percent in the first half of the century, surged in the 1950s, and reached a maximum of three percent in the 1960s. Growth rates then gradually declined in the next two decades but have lingered at just above the two percent level since then.

Figure n° 4.1 – Population growth rate, by intercensal period:
Philippines 1903 – 2000



4.2 - Population structure and dynamics at the national level

The result of the 2000 Census gives a count of the Philippine population of about 76.5 million. This number corresponds with the UN's high variant projection of the country's population for year 2000 and is slightly above the medium series projection of the NSO. Primarily because fertility has been slow to decline, the country has remained in the high variant growth path by international standards.

Two sets of population projections give estimates of the size of the Philippine population in 20 to 50 years. According to the NSO medium series projections, Philippine population will reach 105.5 million by year 2020.¹⁴ With population numbering 76.5 million in 2000, this means an addition of 29 million people in the next two decades. The other set of projections is from the UN Population Division. By 2020, its low variant projection gives a population estimate of 96.6 million, the medium variant, 102.4 million, and the high variant, 108.8 million. By 2050, the Philippine population is expected to be in the range of 107.2 million (low variant) to 158.9 million (high variant) according to UN estimates. Without doubt

¹⁴ NSO targeted NRR=1 for year 2010 for the low series, 2020 for the medium series and 2030 for the high series. The NSO Technical Working Group chose not to compute population projections beyond 2020.

these numbers have very significant implications insofar as availability of land for agriculture, productivity, and food sufficiency of the populace is concerned.

4.2.1 - Structure

At present the country still has a young population: over a third of the people are below 15 years of age and less than a tenth are aged 60 and over. The median age of the Philippine population in 1995 was 20.4 years. A slow aging of the population is, however, discernable (Table n° 4.1, Figures n° 4.2a - n° 4.2b). In 2020, based on the NSO medium series projection, the median age could be 28.4 years. Based on the NSO medium series projections,¹⁵ the following salient points pertaining to age structure are evident: (1) the proportion of people under age 15 is declining, but their absolute number continues to rise until a reversal is apparent after 2010; (2) the elderly population (age 60 and above) has doubled in number since the 1970s and could triple in this decade—by 2020 the elderly will constitute about 10 percent of the country's population; (3) the proportion of young adults (age 15-29) has reached its peak and is now gradually on the decline, even as their numbers continue to rise; and (4) older adults (age 30-59) are continuing to increase in number and proportion. It is clear that a major and immediate challenge confronting Philippine society is the provision of economic opportunities and resources to an unprecedented number of its population in the productive, working ages. It also helps to keep in mind that about half of the working age population is residing in the rural areas (48.8 percent in 1990).

¹⁵ While NSO has publicly released population counts from the 2000 census, a breakdown of the population by age, sex and socioeconomic characteristics is not yet available.

Table n° 4.1 – Population by major age groups:
Philippines 1970-2020.

AGE GROUP	1970 ^a	1980 ^a	1990 ^a	2000 ^b	2010 ^b	2020 ^b
	IN THOUSANDS					
0-14	16,757	20,221	23,994	27,600	28,580	27,661
15-29	9,691	13,698	17,354	21,425	25,724	28,099
30-59	8,560	11,637	16,023	22,678	30,489	38,994
60+	1,646	2,542	3,188	4,645	7,075	10,753
All ages	36,684 ^c	48,098	60,559	76,348	91,868	105,507
	IN PERCENT					
0-14	45.7	42.0	39.6	36.1	31.1	26.2
15-29	26.4	28.5	28.7	28.1	28.0	26.6
30-59	23.4	24.2	26.4	29.7	33.2	37.0
60+	4.5	5.3	5.3	6.1	7.7	10.2

a. Census of Population and Housing, household populations for 1970, 1980, 1990.

b. National Statistics Office, 1995 Census-based National, Regional and Provincial Population Projections (medium series), Vol II, Table 2, p.32.

c. Includes about 30,000 individuals with ages unknown.

As observed, the Philippine population is gradually aging. This is primarily the result of a slow but steady decline in fertility. It must be noted, however, that the pace of fertility decline has not been uniform across the entire country. Specifically, decline has been slower in the rural areas where 51 percent of the population resides. The 1998 National Demographic and Health Survey (NDHS) reported the urban crude birth rate at 25.8 births and the rural rate at 30.1. The total fertility rate was 3.01 for urban areas and 4.67 for rural areas. This disparity in fertility levels has implications on the urban and rural age structures. In 1990, 42 percent of the rural population was less than 15 years old; the corresponding figure for the urban population was only 37 percent. Consequently, the rural population lags behind the urban population in the aging process. To

quote Flieger (1996), the age structure of the country “is

Figure n° 4.1a – Population structure: Philippines, 1995
(NSO projections - medium series)

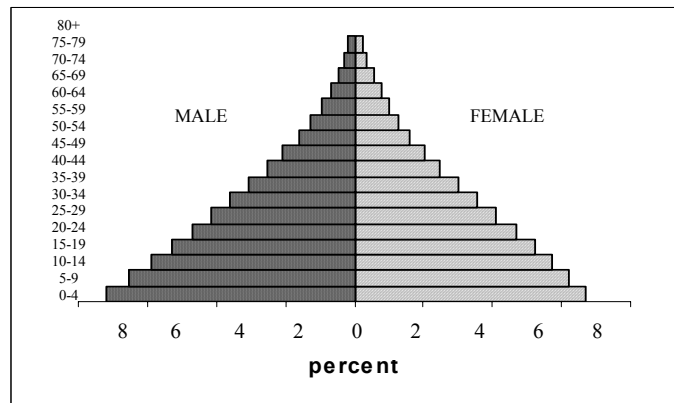


Figure n° 4.1b – Population structure: Philippines, 2020
(NSO projections - medium series)

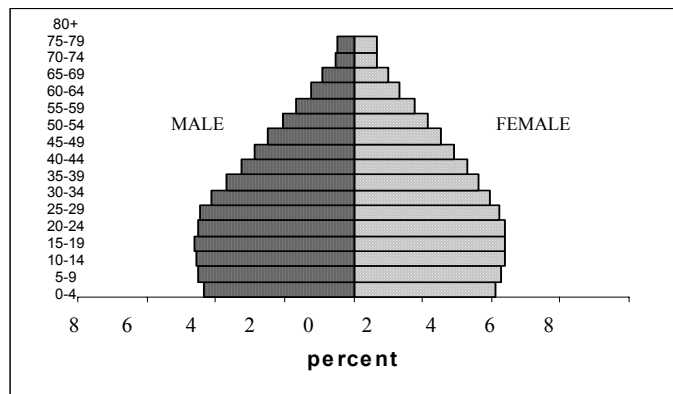
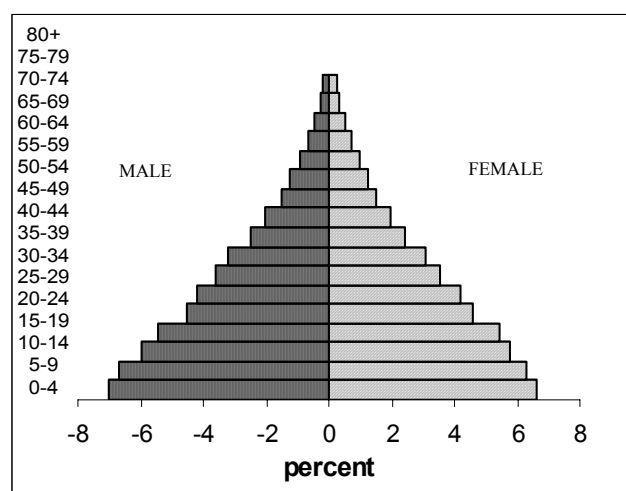


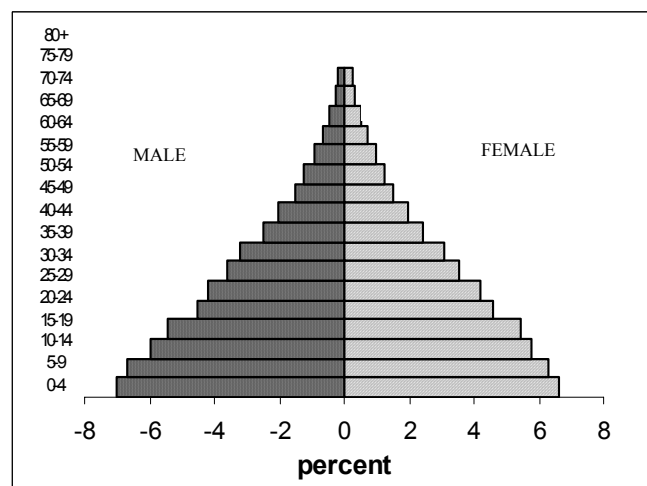
Figure n° 4.1c – Population structure: Philippines, 1995, 2020, and 2050
(United Nations projections – medium and high variants)

1995

Medium Variant

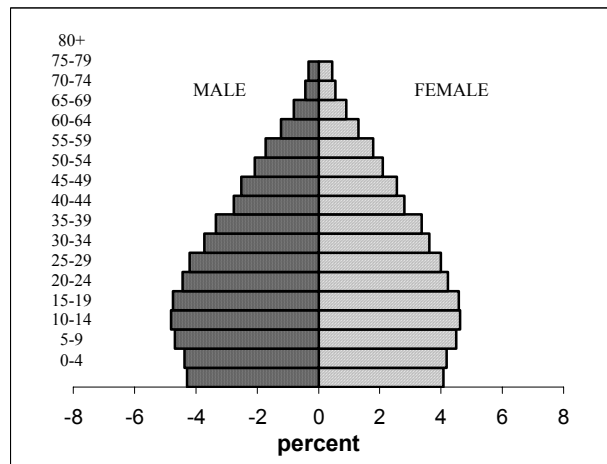


High Variant

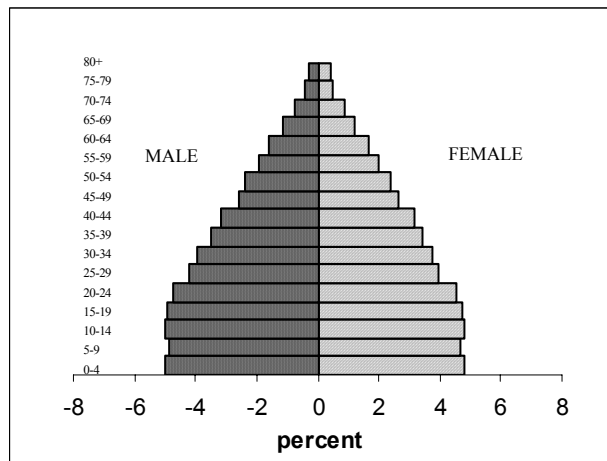


2020

Medium Variant

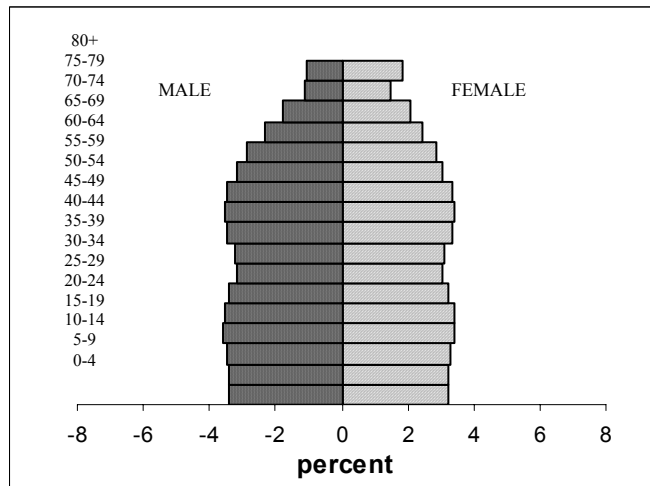


High Variant

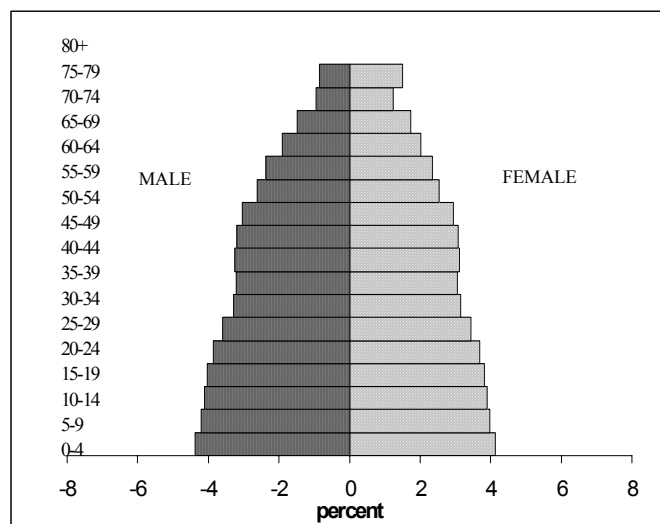


2050

Medium Variant



High Variant

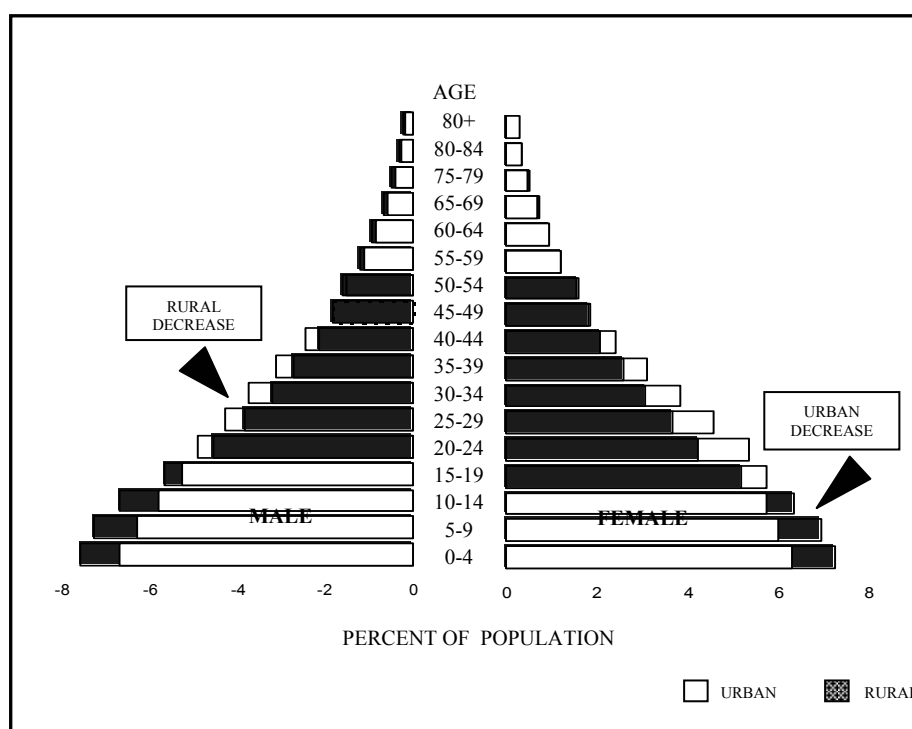


moving in the direction where the age structure of the urban population has moved for some time.”

Flieger compared the 1990 age-structure of the urban population with that of the rural population (Figure n° 4.2) and demonstrated the long-term effects of reduced fertility on the age structure. From the same demonstration another fact emerged: there were more people of ages 15-45 residing in urban areas than in rural areas. This difference cannot be attributed entirely to declining levels of urban fertility; it is primarily the result of the migration of young adults from rural to urban areas. It is further demonstrated that, specifically for age groups 15-29, the urban ‘excess’ is predominantly female suggesting that rural-urban migration in the country is selective of young women.¹⁶ For ages 55 and over, the differences in the urban-rural distribution by sex may well be the result of gender differences in mortality or migration in the urban and rural areas but neither can be ascertained with the data at hand. While it would have been useful to see if these differentials persisted throughout the decade of the nineties, neither the 1995 nor the 2000 Census data permit a disaggregation of the population by urban-rural residence.

¹⁶ This type of selectivity in migration has also been discussed in Gultiano and Ulrich (2000).

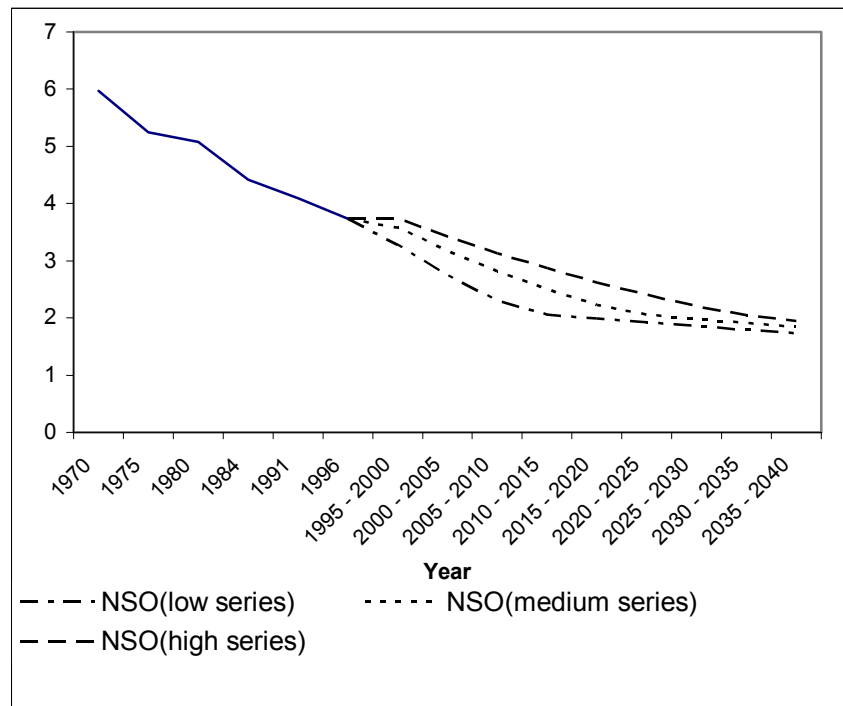
Figure n° 4.2 – Age-structural differences: urban and rural
Philippines, 1990



4.2.2 - Fertility

As in many other developing countries, growth of the Philippine population is mainly a result of natural increase. In the absence of data proving otherwise, international migration is often assumed to have no significant effect on the country's population growth (NSO 1997). Anecdotal evidence suggests that the circulation of such international migration might, in part, also explain the limited impact of such migration on reducing fertility. A majority of migrants are fecund and they do conceive and bear children when they return to the Philippines for short durations. These children remain either with the father or other relatives when migrants return to their overseas employment. The Philippines has sustained relatively high rates of growth because it also has sustained fairly high levels of fertility.

Figure n° 4.3 – Total Fertility Rates: Philippines, 1970 – 2040



Sources: 1970 – 1996 TFRs: National Statistics Office, Department of Health and Macro International, National Demographic and Health Survey 1998, Table 3.3 p. 36 and 1995-2000 to 2035-2040 projected TFRs: National Statistics Office, 1995 Census-Based National and Regional Population Projections, Vol. I, Table 1-1, p. 6

Between 1970 and 1996, the total fertility rate (TFR) of the Philippines decreased from 5.97 to 3.73 births (Figure n° 4.3). Significant declines observed in the 1970s and 1980s, however, failed to gain momentum in the 1990s. With a relatively sluggish decline, the Philippines is not expected to attain replacement level fertility before 2010 (Marquez and Westoff 1999). Under the most optimistic, albeit unrealistic scenario, that the net reproduction rate will equal 1.0 in year 2010 (rapid pace of fertility decline), the NSO has projected TFR to be 3.28 in 1995-2000, declining to 1.99 in 2015-2020 and reducing further to 1.73 in 2035-2040. In the more likely event that NRR will equal unity in year 2020 (moderate pace of fertility decline), the corresponding projected TFRs will be 3.58, 2.23 and 1.84; but if NRR is set to equal 1.0 in 2030 (slow pace of

fertility decline), the TFRs will be 3.74, 2.62 and 1.95, respectively (Figure n° 4.3).¹⁷

In this study it is important to keep in mind that fertility is lower in urban places than in the rural agricultural areas. The 1998 National Demographic and Health Survey reported that rural women had 1.7 more births on average compared to their urban counterparts. They were also having their first child two years earlier than the latter. Rural women were marrying earlier than urban women (at age 20.3 and 21.4, respectively, on average). With respect to contraceptive use, 50.7 percent of currently married women in urban areas and 42.2 percent in rural areas practiced family planning. Only 31.3 percent of the urban women and 25.0 percent of the rural women used modern means of contraception (NSO, DOH and MI 1998). Thus it can be expected that, on average, child dependency burdens and, consequently, problems related to child health and nutrition are more pronounced in the rural areas than in the urban areas. This is aggravated by the fact that in the rural areas young adults, particularly women, have a proclivity to move to the cities, thus leaving the very young in the care of older folks.

4.2.3 - Mortality

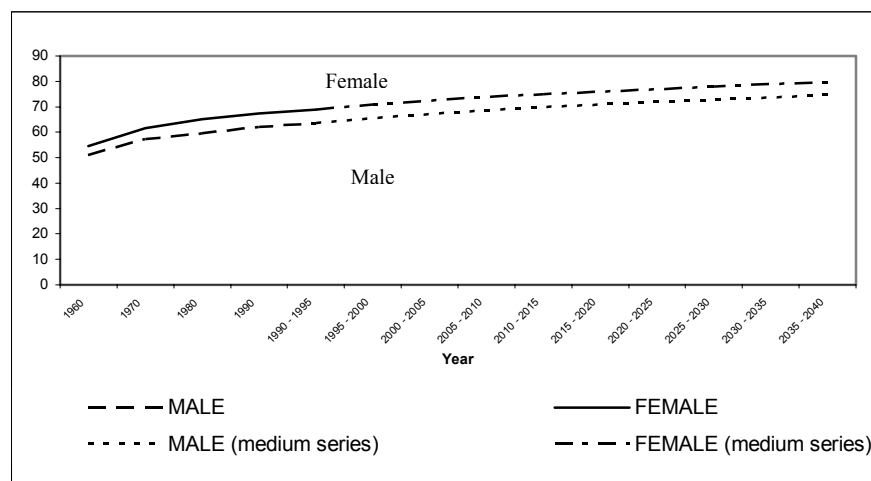
Vital statistics show that the crude death rate for the Philippines decreased from 6.2 per thousand in 1980 to 5.2 per thousand in 1990 (NSO 1995). Life expectancy at birth for males was 51.0 years in 1960 and rose to 62.2 years in 1990; for females it was 54.5 in 1960 and 67.4 in 1990 (Flieger *et al.* 1981; and Flieger and Cabigon 1994) (Figure n° 4.4). Using the 1990 estimates of Flieger and Cabigon (1994) as baseline values and applying the UN's moderate increase in survivorship assumption, the NSO computed male and female life expectancies at birth for the Philippines to be 72 and 77 years respectively in 2020-2025 and close to 75 and 80 years in 2035-2040. Indeed, if family values do

¹⁷ The UN low variant projection estimates TFR to be 3.52 in 1995-2000, leveling off to 1.60 in 2015 to 2040, while the high variant projections estimate TFR at 3.82 in 1995-2000 to 2.60 from 2015 to 2040.

not change drastically, more Filipino households can expect to be living with older kin in the future. Whether and to what extent the elderly will exert influence over family resources and dynamics remains an open question.

The infant mortality rate for the country was recorded at 45.1 per thousand live births in 1980; by 1990 this had declined to 24.3. In the absence of disaggregated contemporary data showing otherwise, the mortality trends observed in the 1960s and 1970s in accordance with the hypothesized mortality-development link upholds the expectation that urban mortality rates are lower than the rural rates (Flieger *et al.* 1981).

Figure n° 4.4 – Male and Female Life Expectancies at Birth:
Philippines, 1960 – 2040



Sources: Flieger, Abenoja and Lim (1960), Flieger and Cabigon (1970-1990), National Statistics Office (1995).

4.3 - International migration

As previously stated, international migration does not count as a growth factor in Philippine population, primarily because data are insufficient to explore the dynamics of migration in the country. Therefore, for purposes of population projections, NSO has assumed

international migration to be negligible, even as it reports selected migration statistics.

Permanent emigration data from the Commission on Filipinos Overseas (CFO) gave an estimate of 401,486 permanent emigrants for the period 1990-1995. Embassy data of major receiving countries¹⁸ yield a slightly higher estimate of 499,929 permanent emigrants. Given that the population of the Philippines was 60.7 million in 1990 and 68.6 million in 1995, these emigration estimates, if not exceedingly unrealistic, do attest to the inconsequentiality of international migration as a component of population change. Relative to emigration, immigration data is even more difficult to obtain. The NSO simply states that: "In the Philippines, such restrictions as the imposition of quotas and establishment of qualifications that potential immigrants must possess have made international migration insignificant as a component of population growth" (NSO 1999:179).

From available data it is useful to note that the majority of emigrants are relatively young. Based on the 1997 statistics, 18.6 percent of the emigrants were under age 15, 33.8 percent

¹⁸ The embassies of four major receiving countries, namely, the United States, Australia, Germany and Canada, provided data on permanent residents from the Philippines by year of entry. From their data were imputed emigration statistics of other countries. The 1990-1995 permanent emigration statistics were obtained from Chapter 4 of NSO's publication *1995 Census-Based National and Regional Population Projections*, Vol. 1, pp. 31-38.

were aged 15-29, while 9.6 percent were in the 30-34 age bracket. With respect to percent were aged 15-29, while 9.6 percent were in the 30-34 age bracket. With respect to their occupational status, 10.1 percent of the 1997 emigrants were professionals and technicians, but a large fraction (71.6 percent) belonged to the 'Others' category consisting of housewives, students, minors, retirees and the unemployed.

The CFO data of emigrants from 1991-1995 by age and gender also show a preponderance of female emigrants in all age groups except those under age 15. Overall, the sex ratio was 191 females for every 100 males. This ratio was highest for age group 20-24 with 502 female emigrants for every 100 male emigrants; for the age group 25-29, the corresponding ratio was 387.¹⁹ The same CFO data also show that 68 percent of the emigrants were below 35 years old.

4.4 - Population structure and dynamics at the provincial level

As explained in Chapter One, the Philippines comprised 14 regions and 73 provinces in 1990 (excluding Metro Manila²⁰). At that time, the populations in these provinces ranged from 12.1 thousand (Batanes) to 2.6 million (Cebu). In 1980, 12 provinces already had populations exceeding one million. Cebu was the only province with a population of over two million. By 1990, two other provinces, Negros Occidental and Pangasinan, reached the two million mark, while the number of provinces with populations of between one to two million had increased to 15. In 2000, there were already 19 provinces with populations of over one million and five provinces with populations of over two million. Cebu, with its rapidly growing metropolitan area, reached the three million mark. Throughout the two decades, three provinces stood out in terms of

¹⁹ Because of the preponderance of female emigrants, NSO opted to use the reversed definition of the conventional sex ratio: females per 100 males rather than *vice versa* for emphasis and ease in analysis.

²⁰ In 1990, Metro Manila had a population of 7.9 million; in 2000 it was 9.9 million and its annual growth during the decade was 2.25 percent.

population size: Cebu, followed by Negros Occidental, then Pangasinan.

The largest provinces are not necessarily the fastest growing provinces in the country (see Figures n° 4.5 and n° 4.6). Two provinces adjacent to the National Capital Region exhibited remarkably high rates of growth in the 1980s and 1990s. Rizal province grew at over five percent annually while Cavite grew by four percent in the 1980s and nearly six percent in the 1990s. Cebu, the province with the largest population in the country, showed relatively stable growth rates of around 2.4 percent annually.

Considering that population growth is the result of fertility, mortality and migration selected indicators of these demographic processes are described below and mapped out for the 73 provinces of the country (see Figures n° 4.5 to n° 4.8, respectively).²¹

Estimates of total fertility rates in 1990 ranged from as low as 2.83 births in Sulu to as high as 6.15 in Northern Samar. Other provinces with relatively low TFRs were Cavite (2.84),

Rizal (2.87), Laguna (2.92) and Tawi-Tawi (3.07). Interestingly, low fertility was observed not only in the highly urbanized provinces surrounding the Metro Manila area but also in the Muslim provinces of Sulu and Tawi-Tawi. Fertility was highest in the depressed provinces of Northern and Western Samar (6.15 and 6.02 respectively) and in Masbate (6.10). Also, all the provinces in Eastern Visayas had TFRs exceeding five births per woman; the same was true for all the Bicol provinces.

Consistent with earlier findings that fertility is higher in rural areas than in urban areas, the TFRs in 1990 showed a negative correlation with the provinces' level of urbanization (coef.=-0.4617,

²¹ Estimates of total fertility rates were obtained from Palmore James *et al.* (1993). Estimates of life expectancies at birth were obtained from Flieger and Cabigon (1994). Net migration estimates were computed by NSO under varying assumptions for the purpose of projecting national, regional and provincial populations to 2020 based on the 1995 population census. These assumptions are explained in NSO's *1995 Census-Based National, Regional and Provincial Population Projections*, Vol. II, pp. 15-21.

$p < 0.001$). Furthermore, TFRs were lower in provinces with high growth rates (coef. = -0.4132, $p < 0.001$), an indication perhaps that, at the province level, urbanization and possibly concomitant in-migration, may be the more relevant engines of growth rather than fertility.²²

With regard to levels of mortality, it was mentioned earlier that average life expectancy at birth for Filipino males in 1990 was estimated at 62.2 years; for females it was 67.4 years. At the provincial level, however, male life expectancy at birth ranged from 47 to 67 years; that of females ranged from 51 to 73 years. The men in Tawi-Tawi and Sulu had the shortest average life expectancies in the country (47.3 and 48.1 years, respectively) as did their women (51.3 and 52.3 years, respectively). The opposite can be said of Pampanga; their men and women had the highest average life expectancy nationwide (66.8 and 72.5 years, respectively). Aside from Pampanga, three other provinces registered a male life expectancy at birth of 65 years and over: Cebu (66.6); Bulacan (65.5); and, Batangas (65.0). Five other provinces had female life expectancies of over 70 years: Batangas (72.1); Cavite (71.4); Rizal (71.1); Cebu (70.9); and, Bulacan (70.3). In general, life expectancy was higher in provinces with higher levels of urbanization (coef. = 0.4740 for males and 0.4966 for females, $p < 0.001$).

Predictably, provinces with high fertility and low life expectancy had a younger age structure than those with low fertility and high life expectancy (coef. for the median age and TFR = -0.6855; coefs. for the median age and male and female life expectancies, respectively = 0.4743 and 0.4893; all with $p < 0.001$). In 1995, the youngest populations in the country were found in Masbate (median age of 17.6), Agusan del Sur (17.7) and Bukidnon (17.8). The oldest populations were in Ilocos Norte (23.3) and Ilocos Sur (23.2).

To probe into the dynamics of inter-provincial population mobility and to anticipate later discussions on the labor force, this

²² A negative association exists between the TFR and the male and female net migration rates (coef. = -0.4480 for males and -0.5368 for females, $p < 0.001$).

section, examines the migration of the working-age population, 15-64. Particular focus is given to the highly mobile young adult ages of 15-29.

Because there are no readily available sources of recent migration data by sex and age,²³ net migration rates were computed for each province using the census survival rate method (Shryock, Siegel and Associates, 1973). The 1990 and 1995 National Census figures were used to estimate net migration between the two periods. For this study, it would have been useful to compute urban and rural migration rates separately, but this could not be done. As explained earlier, the 1995 census did not classify population by urban-rural residence.

The information given in Table n° 4.2 and illustrations presented in Figure 4.8 confirm and highlight a number of contemporary views concerning internal migration in the Philippines. First it demonstrates that Filipinos, like many others, have a propensity to move from rural and less urbanized areas to highly-urbanized centers of the region and the country. Second, this propensity is more pronounced among the youth (aged 15-29) than in other age groups. Third, there is gender selectivity in migration: female out-migrants outnumber their male counterparts in areas of net out-migration, while men outnumber the women in areas of net in-migration. A question that may be asked is where have the women gone. One possible explanation is that, as shown earlier, more women than men left the country. Also, even if implying an error in classification in the context of this level of analysis (i.e., interprovincial migration), it is useful to keep in mind that more women travel short distances, frequently from rural to nearby urban areas for education and employment purposes, and also from one rural area to another for reasons of marriage. All these observations reinforce the fact that, as is the experience of most large Southeast

²³ The NSO (1996) has net migration estimates by sex for the period 1985-90 that it used for population projection purposes. These estimates can be found in the earlier (web) version of this book. Patterns of net migration, however, are fairly consistent with those computed for 1990-95 in this book.

Asian countries, women are more geographically mobile than men (Hugo 1999).

Figure n° 4.5 – Population Size, by Province: Philippines

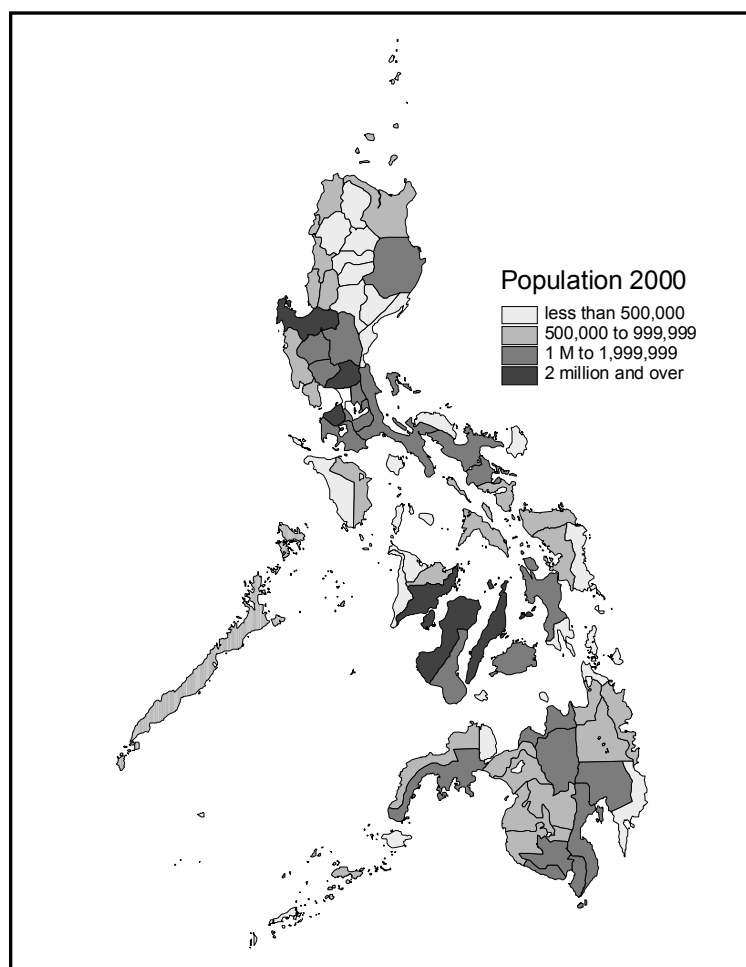


Figure n° 4.6 – Population growth rate, by province, Philippines

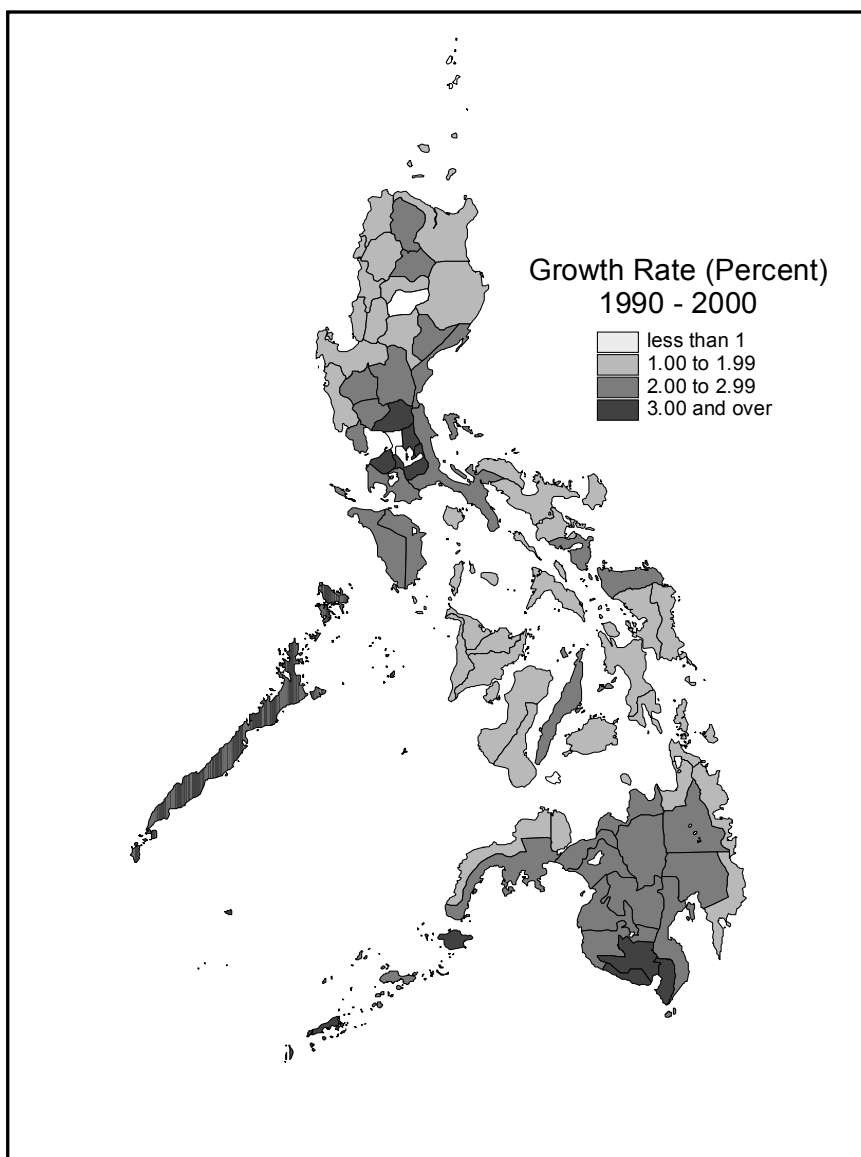


Figure n° 4.7 – Total Fertility Rate, by Province, Philippines 1990

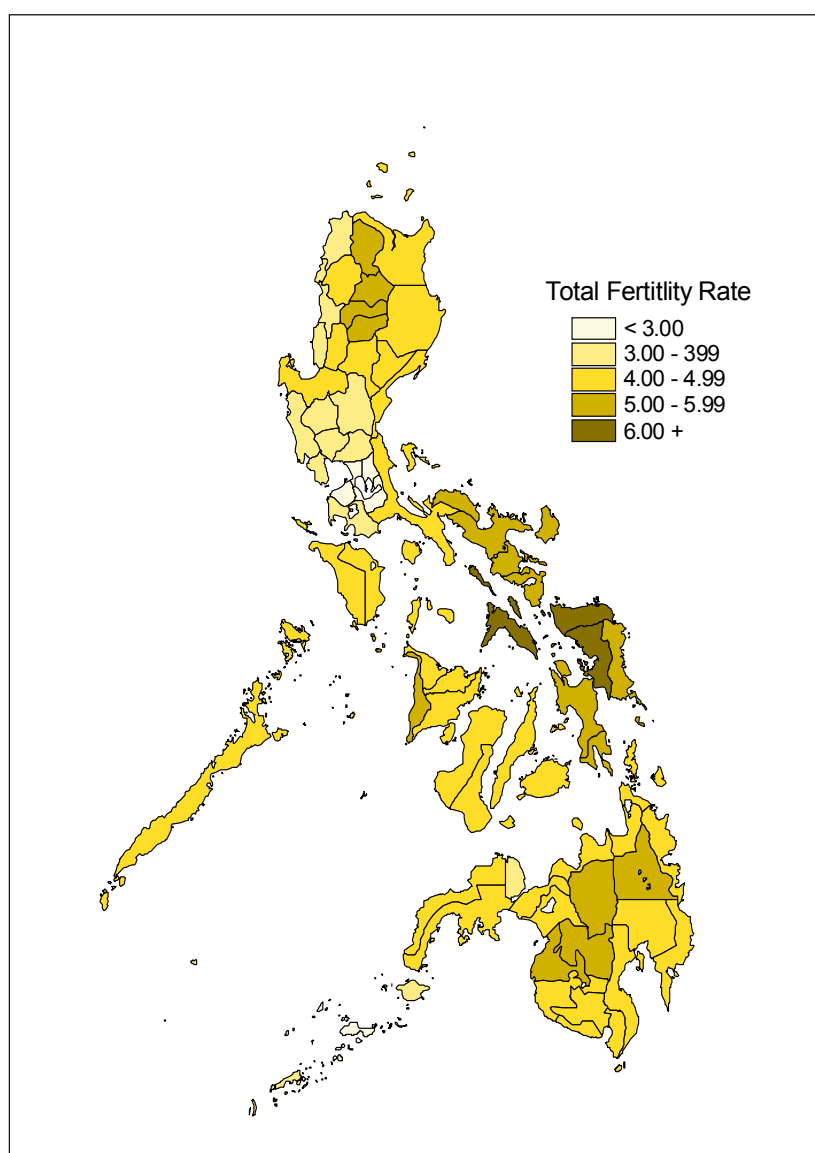


Figure n° 4.8 – Life Expectancy at Birth, by Province:
Philippines, Males and Females, 1990

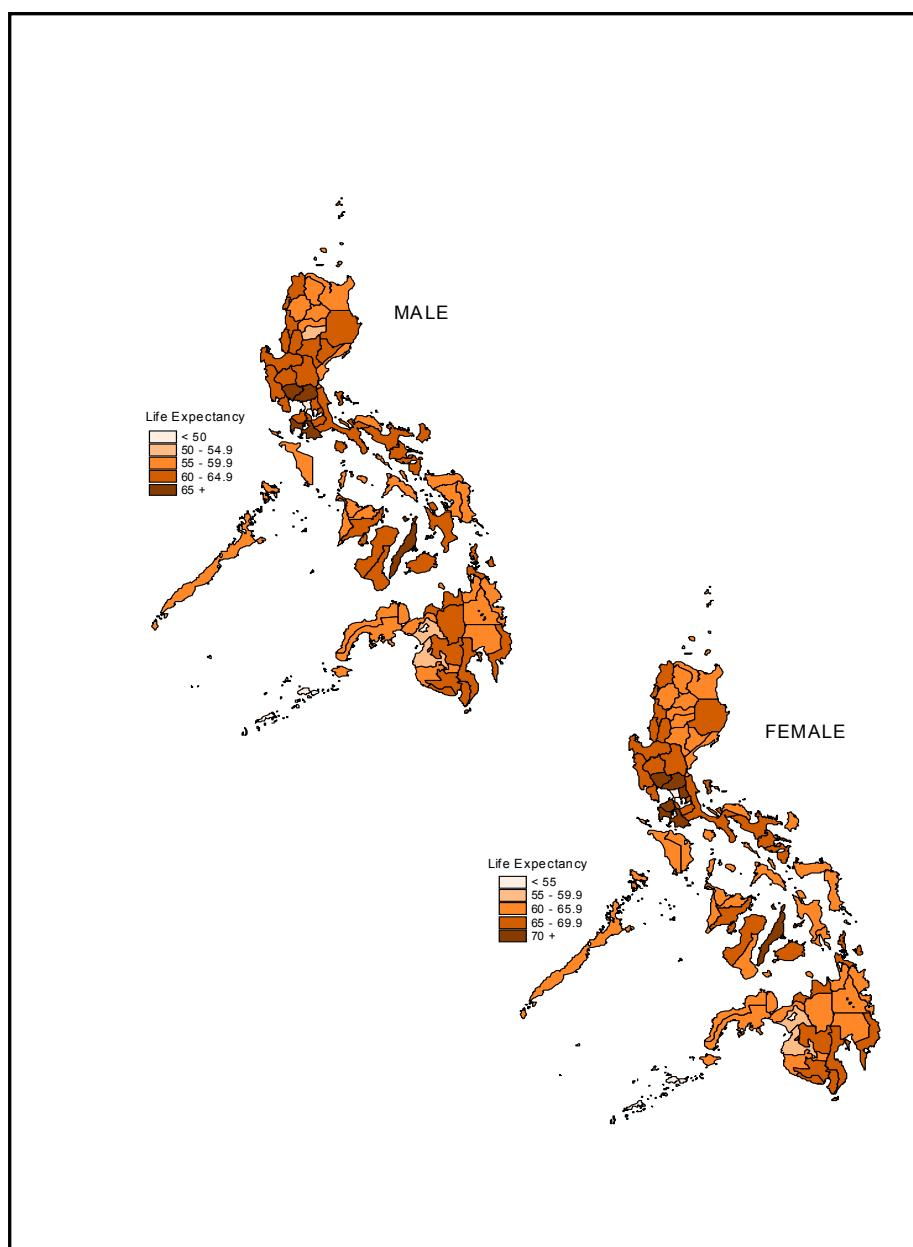


Figure n° 4.9 – Net migration rate, male, female, Philippines,
1990-1995

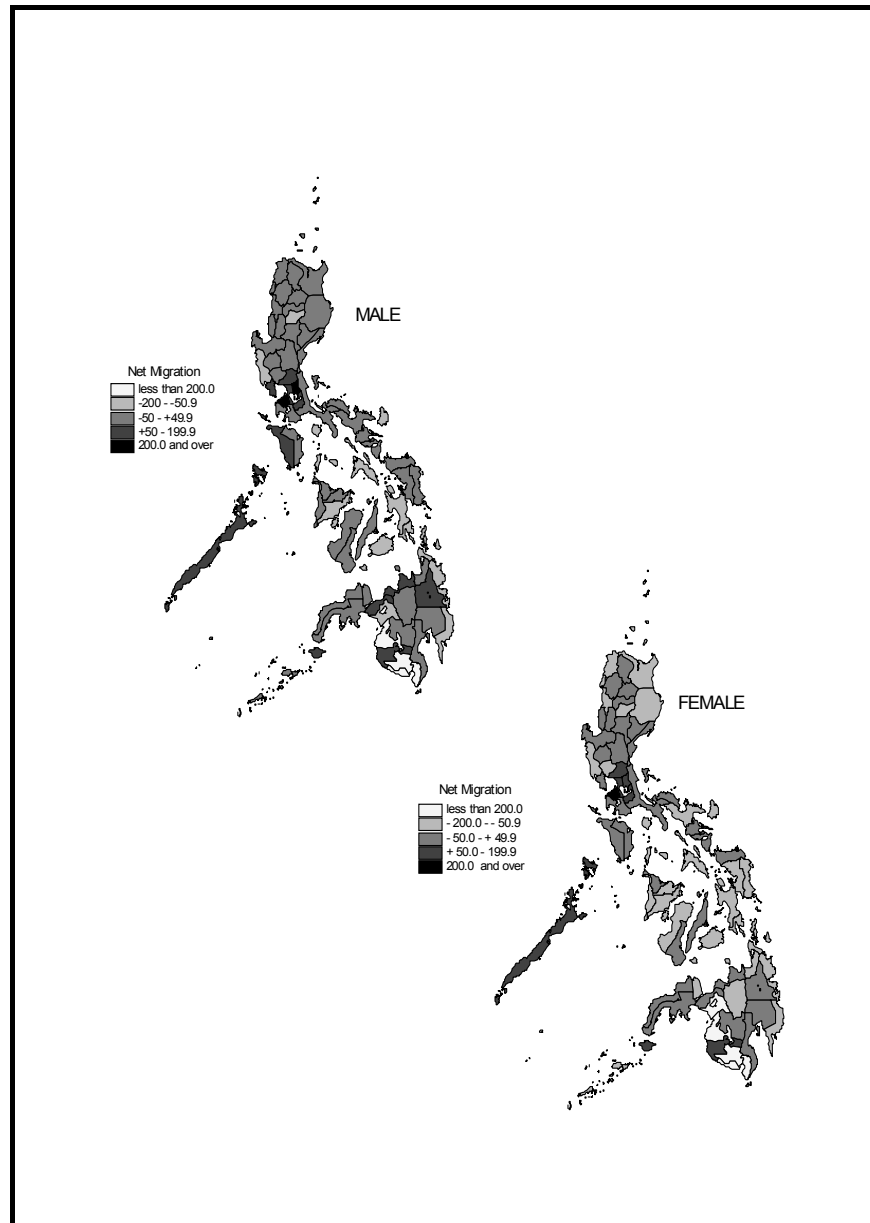


Table n° 4.2 – Net migration rate, by age group and sex, Philippines 1990-1995.

REGION/ PROVINCE	NET MIGRATION RATE AGE 15-64		NET MIGRATION RATE AGE 15-29	
	MALE	FEMALE	MALE	FEMALE
<i>CAR: Cordillera Administrative Region</i>				
Abra	-11.2	-24.7	-27.4	-45.6
Benguet	41.8	-15.6	127.5	42.9
Ifugao	-90.7	-148.0	-110.3	-154.5
Kalinga-Apayao	23.3	5.3	20.3	24.8
Mountain Province	23.9	-1.7	20.9	-1.0
<i>REGION I: Ilocos</i>				
Ilocos Norte	-27.1	-70.9	-61.5	-109.6
Ilocos Sur	-35.2	-61.1	-77.4	-123.9
La Union	9.8	-20.0	-4.7	-51.8
Pangasinan	-25.1	-49.2	-64.4	-97.6
<i>REGION II: Cagayan Valley</i>				
Batanes	-208.9	-215.0	-342.1	-311.9
Cagayan	-25.7	-53.0	-69.2	-108.5
Isabela	-29.5	-67.3	-52.9	-115.0
Nueva Vizcaya	16.0	-15.7	16.4	-25.5
Quirino	36.2	-5.4	26.3	-33.6
<i>REGION III: Central Luzon</i>				
Bataan	72.9	47.9	94.9	79.1
Bulacan	97.2	73.3	124.7	104.4
Nueva Ecija	49.5	25.4	43.1	19.7
Pampanga	-15.3	-51.7	0.1	-43.2
Tarlac	10.1	-20.5	3.1	-38.0
Zambales	-70.0	-138.5	-75.5	-157.5

<i>REGION IV: Southern Tagalog</i>				
Batangas	32.9	26.8	37.0	44.4
Cavite	261.9	242.1	296.2	282.2
Laguna	98.7	75.8	127.2	102.4
Marinduque	-69.2	-75.7	-218.8	-236.0
Occidental Mindoro	74.1	48.3	69.4	45.6
Oriental Mindoro	-29.3	-35.6	-69.5	-71.7
Palawan	104.8	51.7	111.1	69.7
Quezon	16.0	8.0	0.3	-1.5
Rizal	217.5	173.4	258.4	217.8
Romblon	-68.6	-79.0	-176.0	-192.0
Aurora	13.8	-12.4	-21.2	-59.9
<i>REGION V: Bicol</i>				
Albay	-22.0	-43.8	-86.1	-118.7
Camarines Norte	-21.4	-48.9	-81.6	-119.0
Camarines Sur	-27.9	-55.2	-85.0	-113.1
Catanduanes	-64.2	-84.7	-175.8	-205.3
Masbate	-78.4	-100.6	-164.9	-198.7
Sorsogon	-16.7	-41.9	-108.5	-139.5
<i>REGION VI: Western Visayas</i>				
Aklan	-26.5	-49.3	-81.4	-126.9
Antique	-46.5	-78.3	-118.9	-181.9
Capiz	-44.9	-79.8	-101.1	-156.8
Iloilo	-99.1	-128.3	-132.7	-186.6
Negros Occidental	-29.7	-69.2	-71.0	-127.1
<i>REGION VII: Central Visayas</i>				
Bohol	-56.9	-80.1	-143.0	-191.4
Cebu	20.4	-11.1	32.4	4.0
Negros Oriental	-7.9	-36.0	-68.1	-97.5
Siquijor	-69.2	-75.6	-17.3	32.5

<i>REGION VIII: Eastern Visayas</i>				
Eastern Samar	-30.2	-60.5	-105.1	-159.6
Leyte	-101.4	-135.3	-167.4	-217.7
Northern Samar	38.1	19.6	-15.9	-27.8
Western Samar	-36.9	-66.0	-111.5	-158.0
Southern Leyte	-156.7	-173.3	-339.9	-324.4
<i>REGION IX: Western Mindanao</i>				
Basilan	96.8	55.9	73.5	65.3
Zamboanga del Norte	24.6	-16.1	0.2	-42.4
Zamboanga del Sur	-0.0	-38.5	-6.8	-50.3
<i>REGION X: Northern Mindanao</i>				
Agusan del Norte	-15.1	-54.0	-49.6	-105.8
Agusan del Sur	80.2	33.3	64.2	0.1
Bukidnon	-21.1	-67.1	-39.3	-106.2
Camiguin	-48.8	-94.9	-153.7	-241.1
Misamis Occidental	-12.4	-53.5	-54.4	-106.5
Misamis Oriental	71.2	41.8	65.9	37.4
Surigao del Norte	-81.2	-106.7	-142.9	-187.6
<i>REGION XI: Southern Mindanao</i>				
Davao	23.5	-30.7	11.7	-67.1
Davao del Sur	47.1	11.8	64.6	21.7
Davao Oriental	-66.3	-128.9	-112.1	-202.0
South Cotabato	-230.5	-267.6	-218.9	-260.7
Surigao del Sur	-105.3	-160.7	-198.3	-284.4
<i>REGION XII: Central Mindanao</i>				
Lanao del Norte	53.4	32.0	68.1	64.2
North Cotabato	21.2	-28.0	13.2	-39.3
Sultan Kudarat	115.2	60.5	108.6	76.1

<i>ARMM: Autonomous Region in Muslim Mindanao</i>				
Lanao del Sur	-143.7	-289.1	-75.4	-234.3
Maguindanao	-213.3	-337.9	-181.8	-296.0
Sulu	6.6	-139.6	-70.5	-173.9
Tawi-Tawi	-48.4	-166.7	-12.2	-167.3
<i>NCR: National Capital Region</i>	127.4	94.2	243.3	208.4

Table n° 4.3 shows that, from 1990 to 1995 and for population aged 15-64 (working age population), 43 (58 percent) out of the 74 provinces²⁴ in the country were net out-migration provinces for both men and women. In all 43 cases, more women than men had left their provinces. In contrast, 19 provinces (26 percent) were in-migration provinces for both sexes. The remaining 12 provinces recorded net in-migration of males but net out-migration of females in this age range.

For the youth population of ages 15-29, 45 provinces (61 percent) registered net out-migration for both men and women. In 42 of these provinces, the number of female out-migrants exceeded that of males. Nineteen (19) provinces, on the other hand, registered net in-migration for both sexes; in 17 of these provinces, male in-migrants exceeded females in number, while in two, female in-migrants exceeded males. There were nine provinces which recorded net in-migration of males and net out-migration of females and only one province registered net out-migration of males and net in-migration of females.

²⁴ The National Capital Region or Metro Manila is included in this list because it is a major area of destination for migrants. It is also the primary center of education and employment in the country.

As had been the pattern in 1985-1990 (NSO 1999), all the provinces of the Bicol and Western Visayas Regions have remained net out-migration areas. The same could have been said of the Central Visayas Region except that the emergence of Metropolitan Cebu apparently succeeded in reversing migration trends in that province particularly for the younger age groups, 15-29. A similar trend applies for the Eastern Visayas Region where Northern Samar, erstwhile an out-migration area, only recently became an area for immigrants of older working ages. Since the 1960s, these four regions have consistently been reported as net out-migration areas of the country (Flieger 1977).

If provinces are ranked according to net migration rates, seven top the list as out-migration provinces (net out-migration rates of over 100 males or females per thousand of population). These are: Maguindanao, South Cotabato, Lanao del Sur, Batanes, Southern Leyte, Surigao del Sur, and Leyte. Apparently the precarious social, political and economic conditions in these areas prompted residents to find security elsewhere.

In terms of in-migration, the areas in and surrounding the National Capital Region experienced heavy inflow of people. The CALABAR Zone (Cavite, Laguna, Batangas, and Rizal), proclaimed as the economic, industrial and residential extension zone of Metro Manila and aimed at decongesting the National Capital, has served its purpose. Two other adjacent provinces, Bataan and Bulacan, located north of the Capital, are likewise in-migration provinces. Other well-known cities in northern, central and the southern Philippines also succeeded in attracting people into their respective provinces: Baguio City in Benguet, Metro Cebu in Cebu province, Cagayan de Oro City in Misamis Oriental, Davao City in Davao del Sur, and Iligan City in Lanao del Norte (Figure n° 4.10).

From the foregoing it is obvious that heavy in-migration of the working age population is associated with large and fast-growing urban centers. A positive correlation is observed between net migration rates and the growth rates (Table n° 4.4). With respect to fertility, in-migration is associated with low fertility and highly urbanized areas. Conversely, out-migration is associated with high fertility and less urbanized areas. Life expectancy, on the other hand,

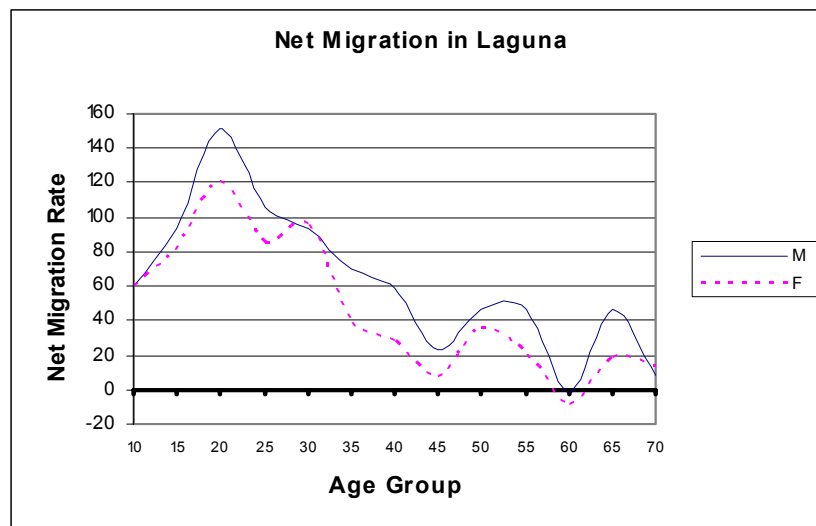
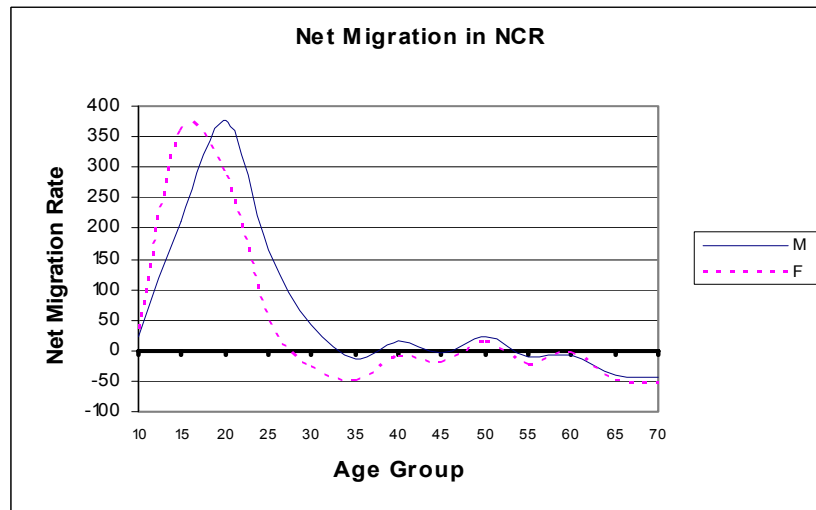
is positively associated with in-migration, particularly that of women.

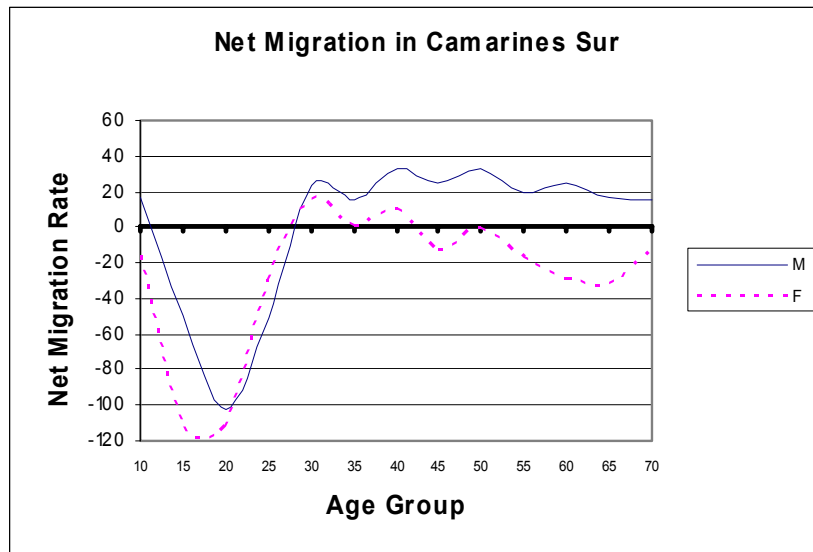
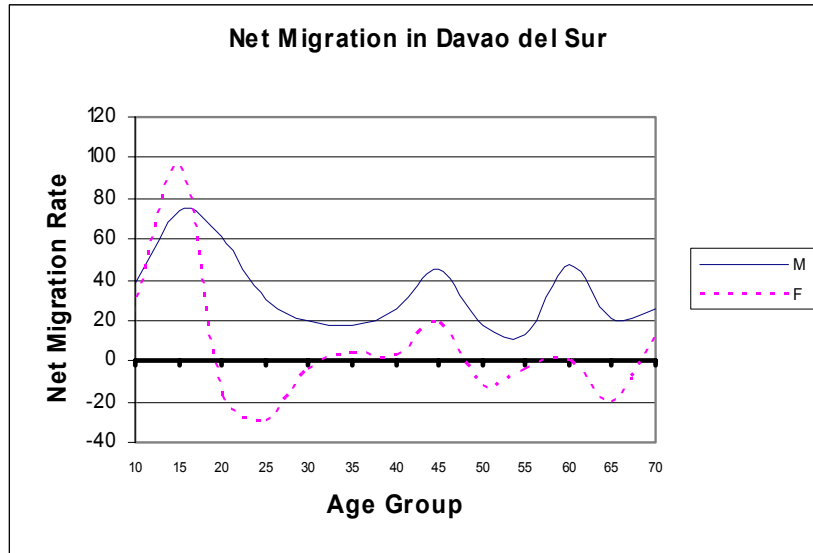
Table n° 4.4 – Pearson correlation coefficients for selected population characteristics and the net migration rate

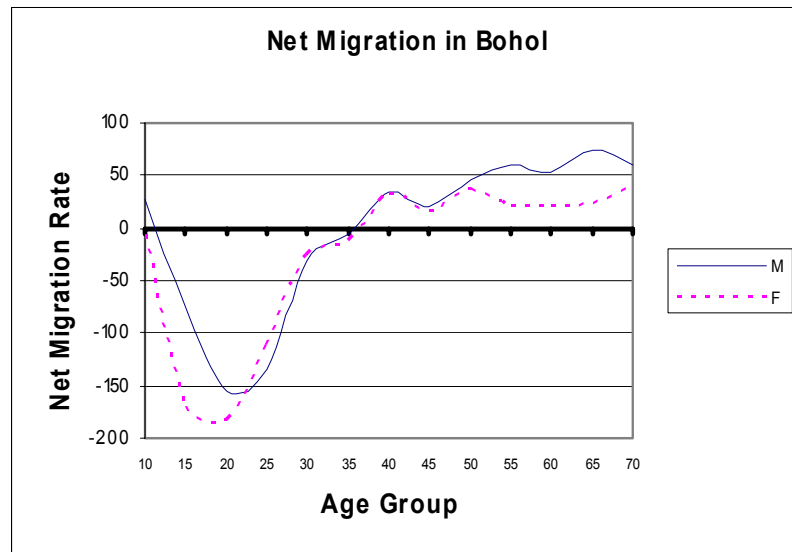
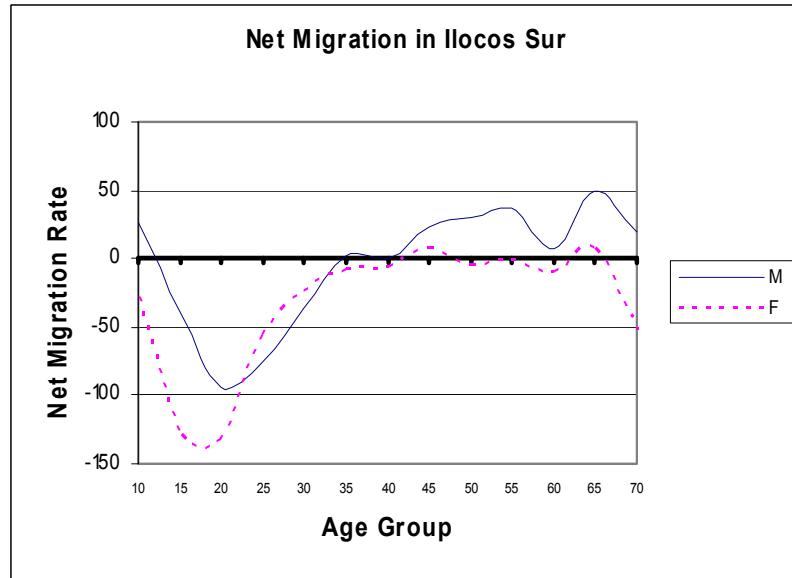
Net Migration Rate, 1990-95	TFR 1990	Life Expectancy 1990	
		Male	Female
Males 15-64	-0.3578**	0.2206	0.3040**
Females 15-64	-0.2745*	0.3814***	0.4562***
Males 15-29	-0.4357***	0.1901	0.2662*
Females 15-29	-0.3944***	0.3039**	0.3731**
Net Migration Rate, 1990-95	Growth Rate		% Urban 1990
	1980-1990	1990-2000	
Males 15-64	0.3964***	0.6649***	0.3775***
Females 15-64	0.2505*	0.5492***	0.3504**
Males 15-29	0.5555***	0.7185***	0.4385***
Females 15-29	0.4508***	0.6660***	0.4021***

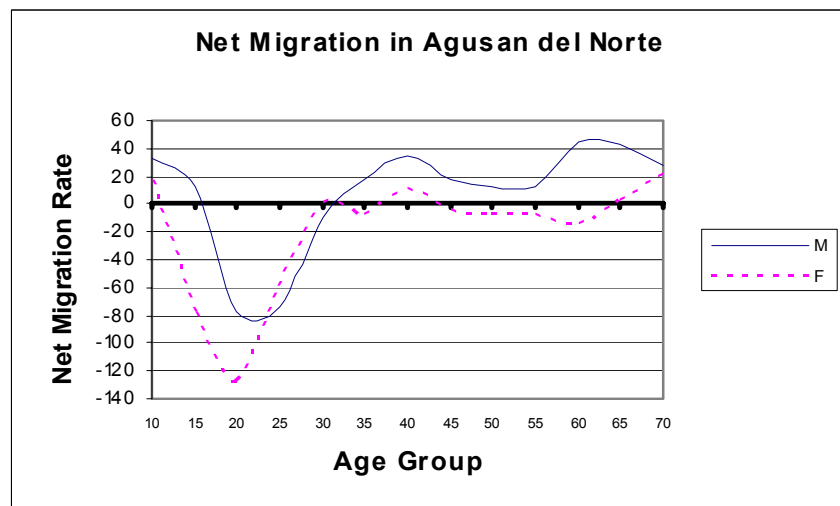
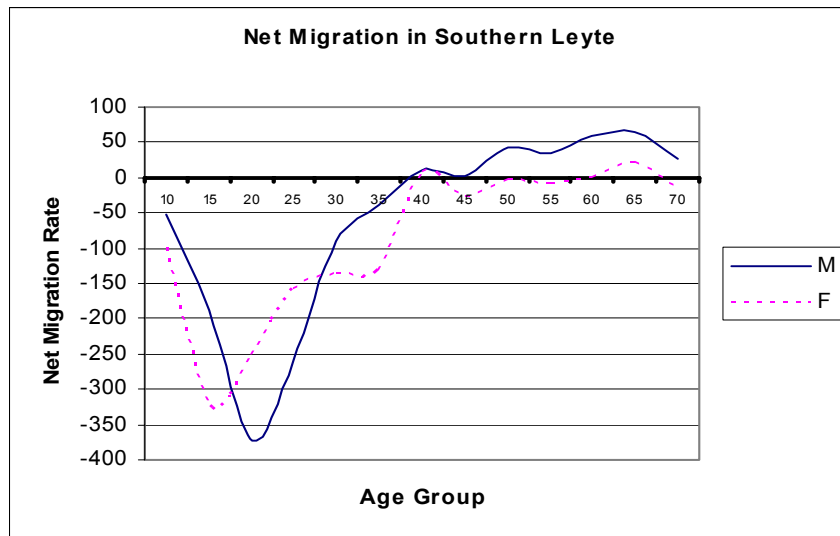
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

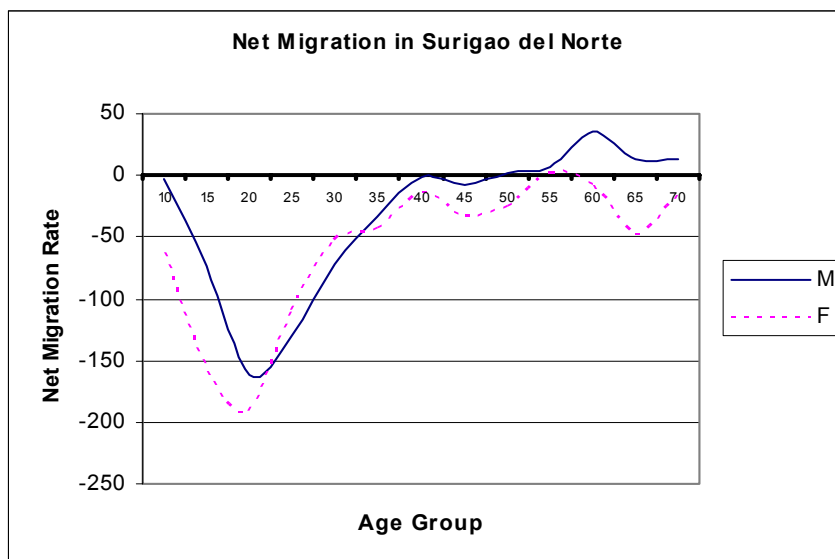
Figure n° 4.10 – Age-specific Net Migration Rates, by Sex:
Selected Provinces of the Philippines, 1990-1995











4.5 - The agricultural labor force

The two most obvious links between population and agriculture have to do with the fact that people are consumers of agricultural products and producers of them as well. This section relates to the latter; it examines the age and sex composition of the people who are working in agriculture in the different provinces of the country.

At the time of the 1990 Census, about 7.2 million Filipinos aged 15 and older were working in agriculture.²⁵ This constituted

²⁵ This information is derived from the 1990 Census of Population and Housing in which agriculture is reported as usual activity or occupation of a person. Usual activity or occupation is defined as “the specific job or kind of work/business which a person is engaged in most of the time during the last twelve months preceding the interview”. This definition differs from that used in the Labor Force Surveys which asks about a person’s occupation in the “past quarter”.

about 22 percent of the 1990 household population in that age group. Of these agricultural workers, about 88 percent were males.²⁶

As expected, the proportion of the population working in agriculture varies considerably by geographic area depending on the prevailing economic activity. Highly urbanized and industrial provinces have a smaller fraction of their population working in agriculture compared to provinces that rely heavily on the extractive industries (for example, mining) and agriculture.²⁷ Figure n° 4.11 illustrates this fact. It shows that the provinces close to Metro Manila (Rizal, Cavite, Pampanga, and Bulacan) have less than 10 percent of their population aged 15 and older working in agriculture. On the other hand, provinces in the Cordilleras (Ifugao, Mountain Province and Kalinga-Apayao) have the highest proportions of population working in agriculture. Next in line are Occidental Mindoro in the Southern Tagalog Region, and Bukidnon and North Cotabato in Mindanao.

In the Philippines there is a preponderance of males in the agricultural sector. Few women are reported to be working in agriculture. Whether, and to what extent, this is an artifact of Philippine Census and Labor Force Survey data cannot be ascertained in this study.²⁸ It is noteworthy, therefore, that in Ifugao and the Mountain Province almost half of women aged 15 and above are reported to be working in agriculture (nearly a quarter are classified likewise for Kalinga-Apayao), whereas in most other provinces, barely 10 percent of the female population 15 and older are reported to be employed in agriculture.

²⁶ It will be noted that in the third quarter of 1990 the labor force participation rate for males was 81.2 percent while that of females was 47.5 percent (NSO 1999).

²⁷ Correlation coefficient is -0.7162 ($p < 0.001$) between percent of population urban and percent of population 15 years old and older in agriculture.

²⁸ It is highly likely that, given the conventional way of inquiring about gainful activities in the Census and Labor Force Surveys, women who help in the farm may not be reported as gainfully employed if these activities are thought of by the respondents as part of their housework and domestic duties and not as an 'occupation' of commercial activity.

4.5.1 - Index of agricultural labor force participation

In most developing countries where agricultural production relies heavily, if not exclusively, on labor, productivity is significantly influenced by the age and sex composition of the labor force. Moreover, it is acknowledged that population mobility is a factor that could alter the age and sex composition of the agricultural workforce. It is for this reason—and in the context of the Charter that sets the guidelines for this study—that an index devised by Collomb (cf. Chapter Two, Appendix 1) is applied as a measure of the extent of participation in agriculture according to sex and age. As explained in Chapter Two, the index consists of three measures: 1] the sex ratio of household heads employed in agriculture; 2] the sex ratio of the agricultural labor force; and, 3] the ratio of men aged 15-34 to men aged 35-54 in the agricultural labor force. Table n° 4.5 lists the values of these three measures and, in the last column, the composite index of agricultural participation for each province in the country.

Figure n° 4.11 – Percent of Population Aged 15 Years and Older Working in Agriculture, Provinces of the Philippines, 1990

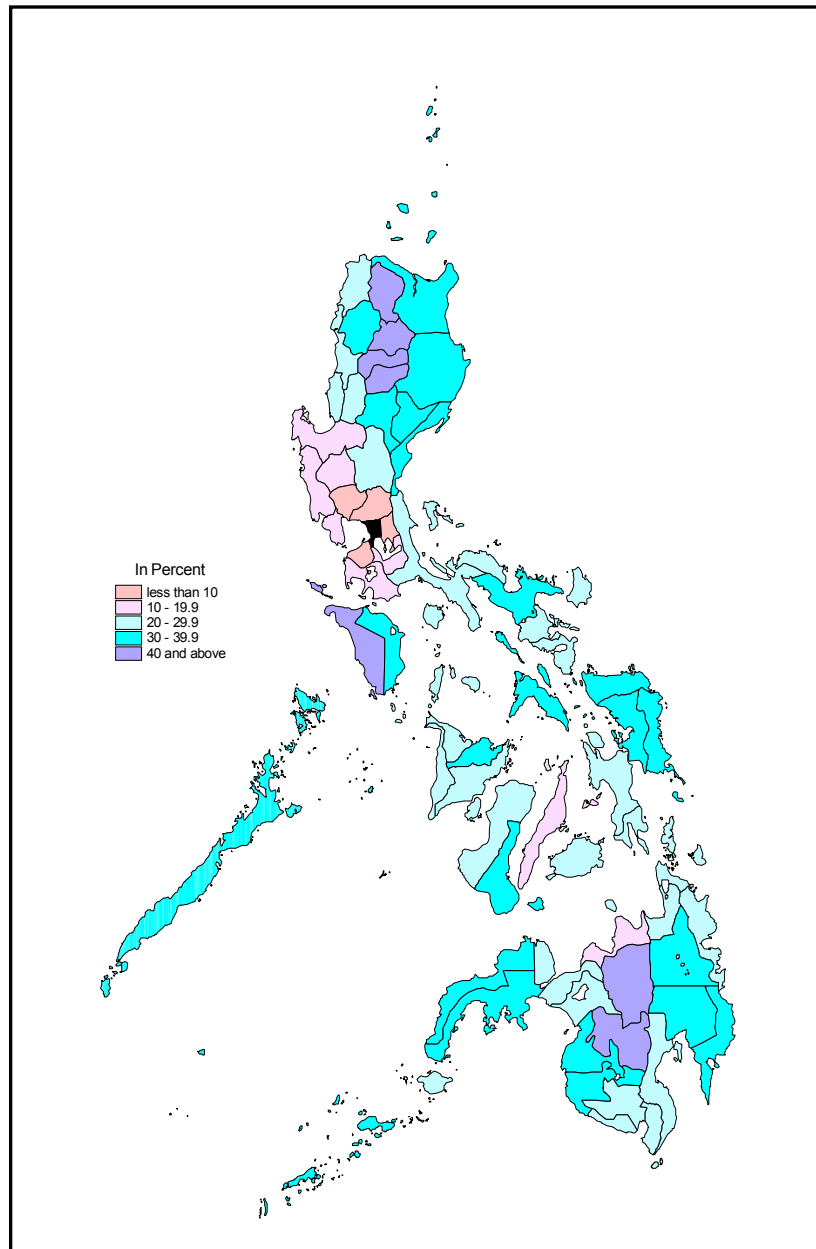


Table n° 4.5 – Ratio, age ratio and index of agricultural labor force participation: Philippines 1990.

<i>Region/Province</i>	<i>Sex ratio of household heads in agriculture</i>	<i>Sex ratio of agricultural labor force</i>	<i>Age ratio 15-34/35-54 of men in agriculture</i>	<i>Index* (Code)</i>
<i>Car (Cordillera Administrative Region)</i>				
Abra	37.07	8.52	1.3	48
Benguet	8.22	1.9	1.82	48
Ifugao	5.4	1.23	1.64	48
Kalinga-Apayao	14.37	3.03	1.51	48
Mountain Province	4.65	1.46	1.58	48
<i>Region I (Ilocos)</i>				
Ilocos Norte	63.84	27.69	1.26	48
Ilocos Sur	28.1	10.95	1.3	48
La Union	26.88	8.94	1.38	48
Pangasinan	53.52	21.73	1.16	48
<i>Region II (Cagayan Valley)</i>				
Batanes	3.39	1.83	1.31	48
Cagayan	33.24	8.18	1.49	48
Isabela	35.65	9.96	1.78	48
Nueva Vizcaya	18.92	3.8	1.62	48
Quirino	47.8	9.12	1.63	48
<i>Region III (Central Luzon)</i>				
Bataan	38.83	15.01	1.39	48
Bulacan	35.98	16.45	1.2	48
Nueva Ecija	35.46	13.91	1.46	48
Pampanga	70.74	33.37	1.27	48
Tarlac	38.5	12.15	1.28	48
Zambales	36.76	21.53	1.09	48
<i>Region IV (Southern Tagalog)</i>				
Batangas	51.68	23.09	1.31	48

Cavite	33.43	18.25	1.16	48
Laguna	33.14	11.98	1.37	48
Marinduque	34.66	16.72	0.84	46
Occidental Mindoro	29.23	4.56	1.66	48
Oriental Mindoro	34.42	12.82	1.63	48
Palawan	29.24	8.5	1.45	48
Quezon	33.24	11.79	1.57	48
Rizal	42.3	14.85	1.23	48
Romblon	29.61	10.68	0.94	47
Aurora	33.32	9.81	1.3	48
<i>Region V (Bicol)</i>				
Albay	36.81	13.81	1.29	48
Camarines Norte	27.51	14.38	1.44	48
Camarines Sur	23.32	3.48	1.79	48
Catanduanes	46.79	18.3	1.26	48
Masbate	20.41	7.95	1.53	48
Sorsogon	37.68	15.81	1.25	48
<i>Region VI (Western Visayas)</i>				
Aklan	17.11	10.35	1.16	48
Antique	28.41	12.59	1.23	48
Capiz	15.51	3.03	1.53	48
Iloilo	23.53	10.7	1.16	48
Negros Occidental	20.94	5.65	1.57	48
<i>Region VII (Central Visayas)</i>				
Bohol	26.76	12.43	1.15	48
Cebu	9.89	3.4	1.35	48
Negros Oriental	17.2	4.55	1.59	48
Siquijor	13.85	5.09	0.89	46
<i>Region VIII (Eastern Visayas)</i>				
Eastern Samar	24.73	7.08	1.23	48
Leyte	21.17	6.81	1.39	48
Northern Samar	31.71	7.98	1.23	48
Western Samar	17.53	4.13	1.37	48
Southern Leyte	54.76	31.67	1.11	48
<i>Region IX (Western Mindanao)</i>				
Basilan	15.45	7.11	1.15	48
Zamboanga del Norte	17.85	5.49	1.54	48
Zamboanga del Sur	24.29	7.08	1.71	48
<i>Region X (Northern Mindanao)</i>				

Agusan del Norte	24.04	10.28	1.46	48
Agusan del Sur	28.9	7.07	1.75	48
Bukidnon	28.46	6.18	1.84	48
Camiguin	43.86	28.46	1.32	48
Misamis Occidental	19.71	8.65	1.38	48
Misamis Oriental	27.94	9.58	1.45	48
Surigao del Norte	17.9	7.39	1.26	48
<i>Region XI (Southern Mindanao)</i>				
Davao	26.73	9.77	1.62	48
Davao del Sur	23.45	7.88	1.67	48
Davao Oriental	30.72	11.05	1.52	48
South Cotabato	26.1	7.66	1.55	48
Surigao del Sur	26.55	9.36	1.25	48
<i>Region XII (Central Mindanao)</i>				
Lanao del Norte	19.95	7.36	1.48	48
North Cotabato	25.35	5.63	1.7	48
Sultan Kudarat	32.63	12.15	1.71	48
<i>ARMM (Autonomous Region in Muslim Mindanao)</i>				
Lanao del Sur	48.42	15.01	1.23	48
Maguindanao	23.95	5.31	1.53	48
Sulu	21.28	3.56	0.98	47
Tawi-Tawi	36.1	3.45	0.97	47

**See Chapter One and Appendix One for additional information on this index.*

From Table n° 4.5 it is evident that: 1] female heads of households working in agriculture are conspicuously a minority in the country in comparison to their male counterparts; 2] in general, men outnumber women in the agricultural labor force by a large margin; and, 3] the male agricultural workforce is comprised mostly of younger rather than older men. All these observations, in the context of Philippine society, are well within expectations.

Filipino culture dictates that the designated head of household should be a man. This norm derives from the assumption that the man is the main breadwinner of the family and his wife, the homemaker (Alcantara 1994; Domingo *et al.* 1994; Eviota 1992). A woman becomes head of household only if no adult male resides in the household. According to the 1990 Census of Population and Housing:

A majority of the households are male-headed; only 11.3 percent of the total households are female-headed. At the national level, male-headed households have an average household size of 5.5 persons while female-headed households, 4.1 persons. ... (E)xcept for households whose head is below 20 years old, the difference in household size . . . further confirms the speculation that females become head of households only in the absence of a male partner (NSO 1992: xxxiv).

Therefore, unless the census and surveys exert extra effort to emphasize and probe into the economic and social consequence of women vis-à-vis men in the household in determining who is to be designated as head, it can be expected that male heads will always outnumber female heads in the Philippines. Although adjustments or corrections can be made—assuming availability of pertinent data—it is doubtful that doing so will tilt the balance in the opposite direction.²⁹ Moreover, there is little reason to believe that agricultural households will deviate from the norm. Considering the more traditional gender role orientation in rural societies and the pattern of rural-urban migration in this country (i.e., selective of young women more than men), such deviation becomes highly unlikely.

As far as the agricultural labor force in general is concerned, the pattern is consistent with that of the entire labor force: more men than women are reported as gainfully employed. Until such time that

²⁹ In measuring sex ratio of household heads in agriculture, we attempted to make corrections (changed the household head from male to female) on the basis of available data, e.g.,: 1] the male household head was unemployed or disabled but his spouse was working in agriculture; and, 2] the male household head was an unmarried son of a widow/unmarried mother who was working in agriculture and was literate and not disabled. These adjustments resulted in a lowering of the sex ratio by less than 0.3 points.

labor force surveys are able to capture and appreciate the economic dimension of women's domestic and unpaid labor, little can be done to alter this pattern. It is perhaps in the agricultural sector where women's contribution is least recognized. Case studies show that women play an important role in agricultural activities (Alcober and Morales 1992; Illo and Pineda-Ofreneo 1989), though some qualitative data have substantiated women's role in agriculture as only supportive and thus subordinate to that of men:

A majority of the focus group discussion (FGD) participants said that farming activities are the responsibility of men; "but sometimes it depends on the women if they want to help". One participant said that "usually . . . the wife would prepare the food for the husband and it is up to them if they want to assist in the farm". However, according to one participant, women are forced to do farm work when the husband is sick. One participant admitted that some women are able to do men's jobs like plowing the fields. (Gultiano and Antiporta 2001).

However a report published for a conference on persistent organic pollutants noted the following on Filipino women's role in agriculture and their lack of recognition:

Official figures show that women compose 35 percent of the agricultural labor force in the Philippines and Malaysia, 35 percent in Indonesia and 60 percent in Thailand. In general, women in agriculture have seldom been regarded as economic partners. They are often plain and simple housewives. This concept of women's role has restricted their access to agricultural development services including finance, extension, information, technology and training support. This minor regard for their role has affected not only

their economic productivity but also their health and that of their children.³⁰

Table n° 4.5 (and Figures n° 4.12, n° 4.13, n°4.14 and n° 4.15) show wide disparities across provinces as far as the sex ratios and labor force participation in agriculture are concerned. For example, in Batanes, Mountain Province and Ifugao, the sex ratios of household heads working in agriculture are as low as 3.4, 4.7 and 5.4 males per female household head, respectively. However, in Pangasinan, Southern Leyte, Ilocos Norte and Pampanga, these ratios are as high as 53.5, 54.8, 63.8 and 70.7, respectively. In regard to the overall sex ratio of the agricultural workforce, the same provinces stand out: Ifugao, Mountain Province and Batanes have the lowest sex ratios (ranging from 1.2 to 1.8 males per female agricultural worker), while the ratios for Ilocos Norte, Southern Leyte and Pampanga are still among the highest (27.7, 31.7, and 33.7, respectively).

³⁰ Philippine Case Study: A Developing Country's Perspective on POPs. Prepared by the Philippines for the IFCS Meeting on POPs, 17-19, June, 1996- Manila, Philippines. <http://irptc.unep.ch/pops/indxhtmls/manexp7.html>

Figure n° 4.12 – Percent of Population Aged 15 Years and Older Working in Agriculture, Provinces of the Philippines, 1990

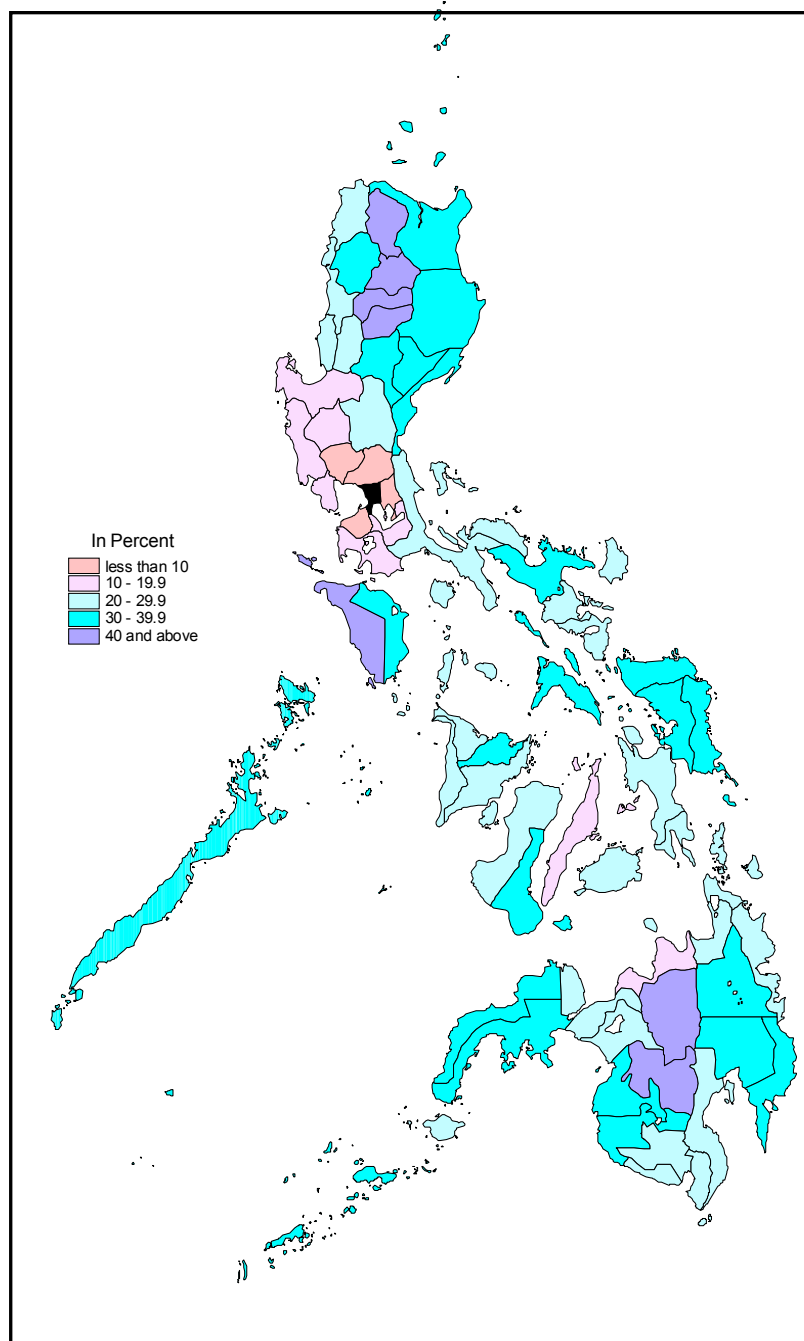


Figure n° 4.13 – Sex Ratio of Household Heads Employed in Agriculture: Provinces of the Philippines, 1990

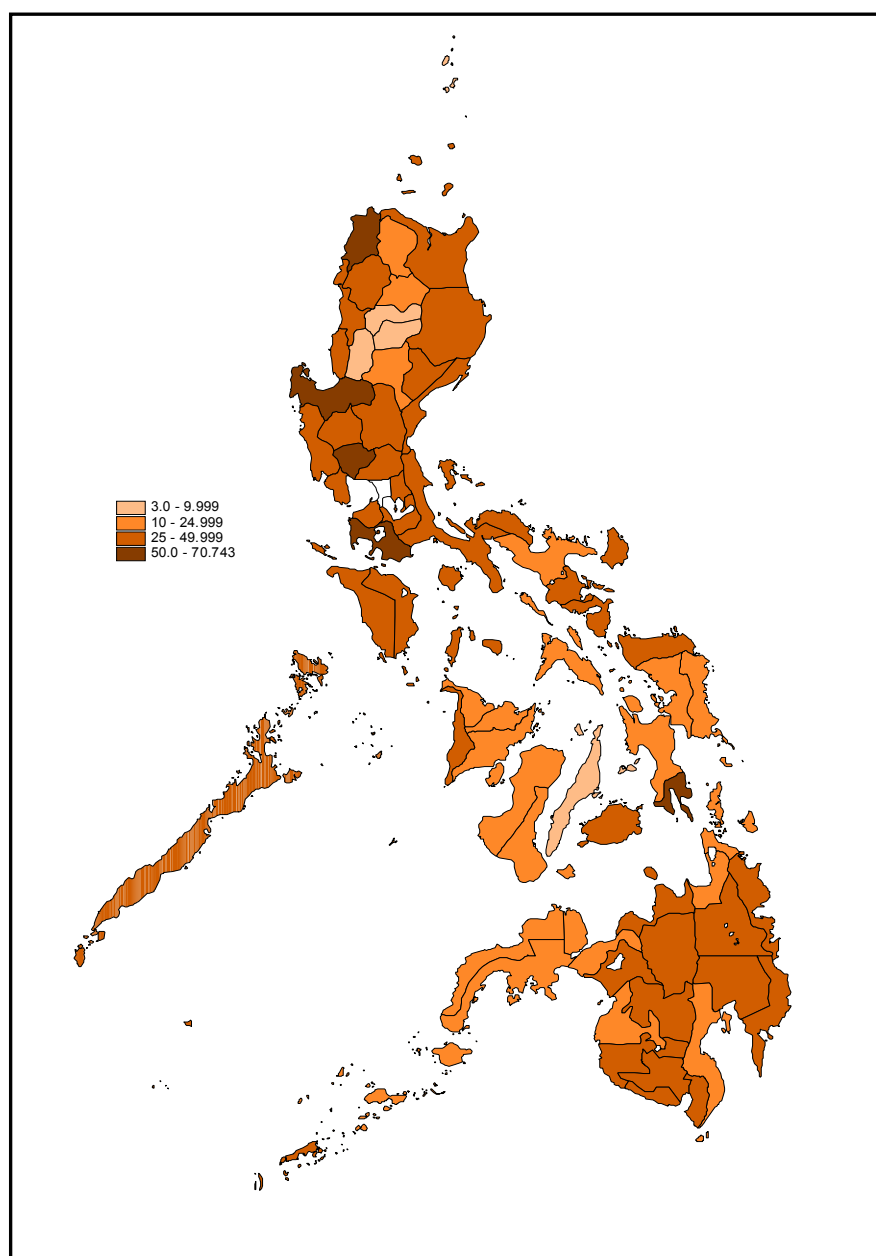


Figure nº 4.14 – Sex Ratio of the Agricultural Labor Force, 1990

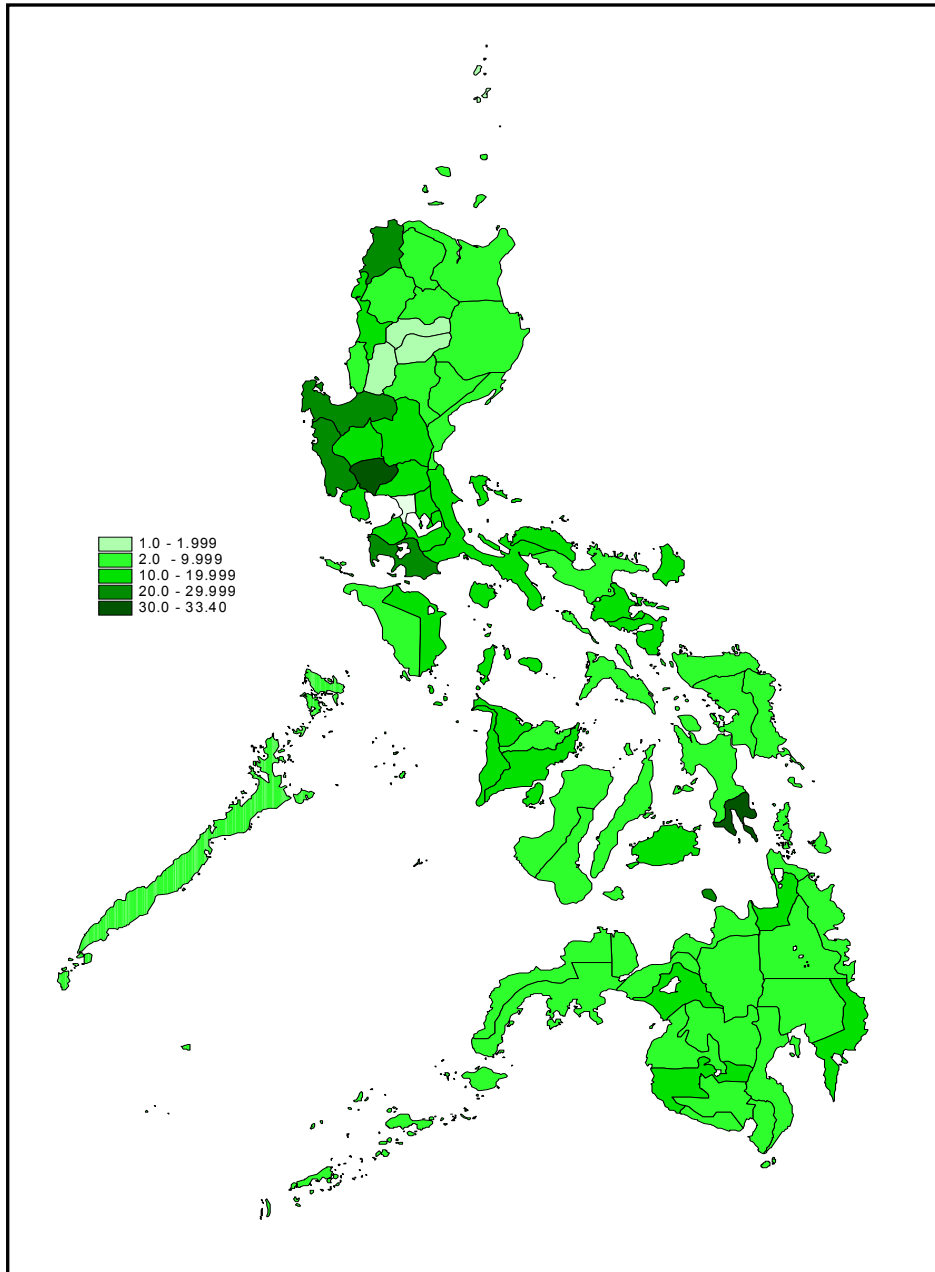
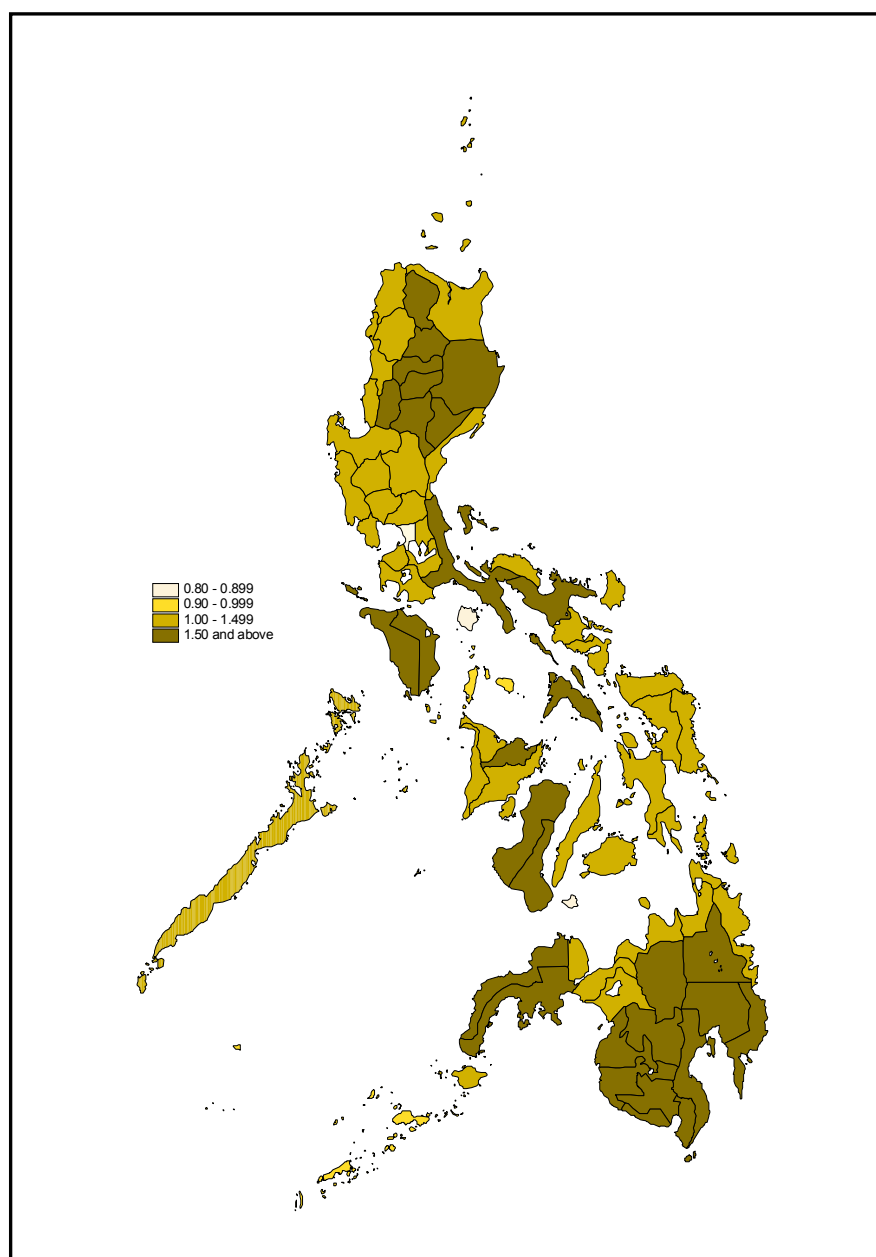


Figure n° 4.15 – Ratio of men aged 15-34/35-54 in the agricultural labor force, 1990



The age ratio of the male agricultural workforce echoes the still-youthful structure of the Philippine population. As explained earlier, the country is experiencing a youth bulge largely as a consequence of high fertility in the recent past. Thus, with the exception of five provinces (Marinduque, Siquijor, Romblon, Tawi-Tawi and Sulu—all net out-migration provinces), the ratio of men aged 15-34 to those aged 35-54 in the agricultural labor force exceeds 1.0.

In all provinces in the country that have sex ratios (of household heads in agriculture in particular, and the agricultural labor force in general) exceeding 1.0, only the age ratio of the male agricultural workforce is able to differentiate provinces for the purpose of index construction. In consequence, although most of the provinces have a code of '48' as Index of Agricultural Participation, Marinduque and Siquijor have a code of '46', while Romblon, Sulu and Tawi-Tawi, have a code of '47' (Table n° 4.7).

4.6 - Agricultural labor force, land ownership and agricultural production

To provide better insights into the dynamics of population and agriculture, it is important to examine the relationships, if any, between sex and age composition of the agricultural workforce and land ownership as well as cropping patterns and productivity in agriculture. Before that, however, it is useful to point out that the ratio of males aged 15-34 to males aged 35-54 in the agricultural workforce is significantly ($p < 0.05$) and negatively associated with both the sex ratio of the agricultural workforce (coef. = -0.3852) and the sex ratio of household heads in agriculture (coef. = -0.2553). Naturally one can expect more men than women as heads of households in provinces where older men predominate in the agricultural workforce. Conversely, provinces with more young males in agriculture imply a relative shortage of men to head agricultural households in which case the surviving spouse has likely taken over as head.

At the province level, the sex ratio of the agricultural workforce is negatively correlated with percentages of farms and

farm area in the province that are fully owned (Table n° 4.6). Similarly, the sex ratio of household heads working in agriculture is inversely associated with total farm area fully owned. In contrast, no significant correlation is observed between percent of farms and farm area tenanted and either of the two agricultural sex ratio measures. There is, however, a significant positive association between the sex ratios and the percent of farms, as well as farm area, that are partly owned. These correlations imply that an overabundance of men in the agricultural workforce (and as heads of agricultural households) could result in the deterioration of full-ownership status of farms and, consequently, a shift towards part-ownership status. Likewise implied is that the pervasiveness of women in agriculture (and as heads of agricultural households) denotes the preservation of ownership and possibly the prevention of the fragmentation farmlands. A widow, who takes over from her husband in the operation of the farm, prevents her children from dividing the farm into smaller parcels and dividing it among themselves.

Table n° 4.6 – Pearson's correlation coefficients for selected 1990 agricultural labor force indicators and 1991 tenurial status indicators: Philippines.

	<i>Percent of farms</i>		
	Fully owned	Partly owned	Tenanted
Sex ratio of HH heads in agriculture	-0.2124	0.2660*	-0.0914
Sex ratio of agricultural labor force	-0.3498**	0.3290**	-0.0181
Age ratio of men aged 15-34/35-54 in agric.	-0.0064	-0.1061	0.0929

	<i>Percent of farm area</i>		
	Fully owned	Partly owned	Tenanted
Sex ratio of HH heads in agriculture	-0.3812***	0.2768***	0.0330
Sex ratio of agricultural labor force	-0.4846***	0.4076***	0.1380
Age ratio of men aged 15-34/35-54 in agric.	0.1702	-0.2208	-0.0728

- $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

With respect to agricultural production, the data shows that the percent of farm area planted to rice is positively associated with the sex ratio of household heads in agriculture (coef. = 0.2998; $p < 0.05$). This means that in prominent rice-growing provinces of the country there is a preponderance of male heads of households. With regard to percent of farm area planted to corn, a negative association with the overall sex ratio of the agricultural labor force is observed (coef. = -0.3118; $p < 0.01$). Although an oversimplification, it may be deduced that women are generally associated with planting corn,

while men are associated with planting rice. This may in part be due to the fact that planting rice is more physically demanding than planting corn.

Chapter 5: Philippine Land Holding Patterns and Agricultural Production

5.1 - Introduction

Situated between two of our main variables—demographic change and food security—are the mediating variables of land tenure structures and dynamics. Land tenure systems act to link and shape the relationships between the dynamics of population, land use and ultimately food security. Locally derived interpretations of land law and resulting land holding patterns are diverse across the archipelago. It is the different histories and natures of attachment of individual islands and regions to the metropolitan centre that have mediated the influence that state-defined land law has had locally. The relationship therefore that population has with tenure is concomitant.

5.2 - Size and fragmentation of farmlands

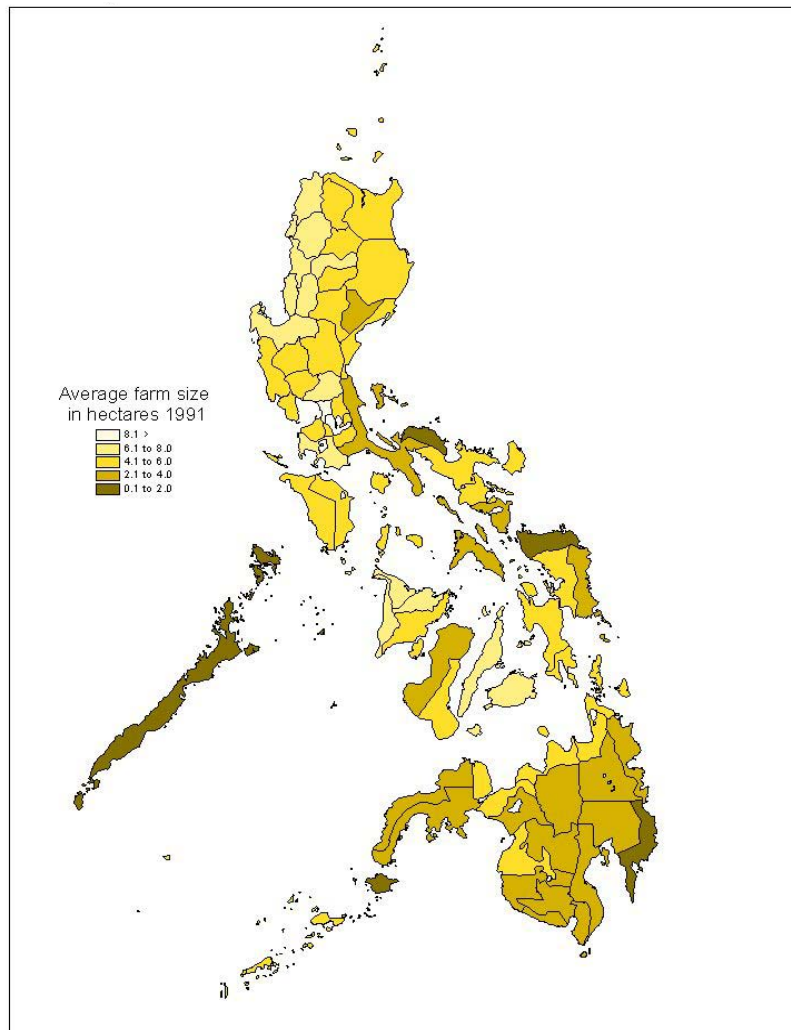
The number of farms and total farm area in the country has increased over time. This is a consequence of how land is allocated and held rather than a crude relationship between growth and population and that of the number of farms. For example, population can grow while the number and area of farms remains static; each land unit simply absorbs more labor, a theory popularized by Geertz (involution) in Java, Indonesia. In 1960, the reported number of farms was 2.17 million. This increased to 2.35 million in 1971, then to 3.42 million in 1980. By 1991, there were 4.61 million farms in the country. Correspondingly, total farm area had increased: from 7.77 million hectares in 1960 to 8.49 million hectares in 1971; and from 9.73 million hectares in 1980 to 9.97 million hectares in 1991. During these three decades, the number of farm holdings in the country had increased by 112.4 percent, but farm area increased by only 28.3 percent. In the first of the intercensal periods the relationship between the number of farms and land area were relatively even (8.3 and 9.3 percent respectively) confirming that farm size changed little. But the decade 1971-1980 saw the number of farms increase by 45.5 percent while the total farm area grew only

14.6 percent. Average farm size fell from 3.6 hectares in 1971 to 2.8 hectares in 1980. This trend continued in the next decade with the total farm number growing by 34.8 percent while the total farmed area increased by only 2.5 percent. Thus the average farm area per farming household decreased by only 2.5 percent. Although it initially remained relatively stable at 3.6 hectares from 1960 to 1971, average farm size shrank to 2.8 hectares in 1980, then to only 2.2 hectares in 1991. As the population grew, population pressure took a heavier toll on farming households in terms of the land area at their disposal.

Rapid population growth contributed to subdivision and in some environments fragmentation of land holdings (Figure n° 5.1).³¹ The proportion of farms of less than one hectare has increased alarmingly from 1960 to 1991. Where only about one-tenth of the farms were of this size in 1960, one-third were in this category in 1991. Because all other farms with areas of over one hectare (1 to 2.9 hectares, 3 to 4.9 hectares, 5 to 9.9 hectares and 10 hectares or more) had decreased in proportion between 1960 and 1991, it can be surmised that subdivision (and some fragmentation) of land was pervasive throughout the country.

³¹ Fragmentation in this case refers to land holdings held by one individual that are not contiguous. It is not uncommon for those that have access to land, especially in the wet lowlands to hold separate parcels in different ecological zones (typically wetter and slightly drier lands). In this way farmers are adapted to wet and dry climatic cycles. Subdivision is also common with what were once larger holdings being subdivided, often through inheritance, but they remain contiguous and very often, as these farm sizes diminish in size they are cultivated by one nuclear family while the rest of the land owners migrate for other economic opportunities.

Figure n° 5.1 – Average farm size in hectares by province, 1991



Not only has subdivision reduced farm size but holdings have often been fragmented into a number of parcels. A parcel is any contiguous piece of land, regardless of size, used by one farm operator under one form of tenure. The number of farms which consist of several non-contiguous parcels appears to have increased. In another form of fragmentation a farm operator owning only a

small piece of land may opt to work on other people's land or some marginal public land to increase family income. This probably was the case for many farming households although the practice had not become evident until lately. Between 1960 and 1980, the proportion of farms consisting of two to five parcels (these parcels could theoretically all be under the same form of tenure) declined from 42.4 to 36.0 percent while the proportion with single parcels increased from 55.3 to 62.8 percent. Between 1980 and 1991, however, the trend had reversed: farms with one parcel decreased to 39.3 percent, while those with two to five parcels increased to 59.4 percent. It may be that fragmentation of farm holdings in the 1960s and 1970s had meant giving up some parcels, in many cases as inheritance to older children. In the 1980s, farming of additional parcels, under either one type or varying types of tenure, probably became a farmer's way of coping with the drastic reduction of the size of farm parcels he or she originally owned or operated.

5.3 - Land tenure systems and agricultural productivity

Census data on tenurial status, while somewhat difficult to interpret, appears to lend support to the coping mechanisms mentioned above. At the time when single-parcel farms had increased in proportion (1960-1980), the percentage of farms fully owned increased as well (from 44.7 percent to 58.3 percent). Thereafter, when farmers needed to operate on more parcels, the percentage of fully owned farms decreased to 43.4 percent. In consequence, the percentage of partly owned farms increased: from 10.7 percent in 1980 to 33 percent in 1991.³²

What is not easy to explain is the conspicuous decline (by 53.4 percent) in the proportion of farms that were fully tenanted (from 37.1 percent in 1960 to 17.3 percent in 1991). The CARP that was enacted into law in 1988 offers only a weak explanation. Generally, the public lands controlled by central government have been allocated more rapidly than has changing ownership (through

³² Fully owned farms include owner-like possession such as Certificate of Land Tenure (CLT) holders, lands to be inherited, etc.; partly owned means that some parcels of the farm are fully owned while others are tenanted, etc. Tenanted farms include leased farms (for purposes of comparability across the four censuses).

sales or leases) of the ‘alienable and disposable’ (privately owned) lowlands. Fifty percent of targeted public lands were dispersed by 1995 versus 35 percent for privately held lands, which in the case of the latter were attained largely from the small-holder sector (Lim 1995). More telling is the failure of CARP to redistribute holdings of above six hectares in the private land sector. Only 7,508 or 0.8 percent of 845,012 hectares of private land identified for redistribution had been disbursed by 1995. Meanwhile the allocation of public lands moved relatively quickly in spite of the fact that many of these lands have important geographical and ecological features that constrain their full and sustainable development for agriculture. They are often steeply sloping with fragile soils, and are situated at the headwaters of important river systems.

Census figures and the study by Jackson (1992) show, for example, that the decline in the proportion of fully tenanted farms started in the 1970s and earlier. It is also observed that the percentage of farms (and farm area) of 10 hectares or larger had started to decrease prior to 1980. Moreover, according to the National Statistics Office, as of 1995 the Agrarian Reform Program had distributed 293,427 hectares of public and private land to 172,556 farmer-beneficiaries. The number of beneficiaries barely constituted four percent of the total number of farm operators in the country in 1991.

Although the proportion of fully tenanted farms declined, tenancy remains prevalent in the country. The fact that the percentage of partly, as opposed to fully, owned farms increased could mean that the new parcels being farmed are done so on a tenancy basis. Important also in this regard is the unintended impact of the recent attempt at agrarian reform: owners of land have been reclaiming once-tenanted land from their tenants and returning operation to, in many cases, other family members so as to circumvent agrarian reform policy.

5.4 - Productivity by crop type

More specific data are now presented on the productivity of two major food crops and one cash crop. These are the common

crops grown in every region and province in the Philippines. However, of the two crops only rice has production data available by province (our chosen unit of analysis). Corn has regional data only.

5.4.1 - Rice

Rice is the staple food of Filipinos. Filipinos harvest rice from some 3.15 million hectares. Rice is however only grown on approximately 2.3 million hectares, but of this area 850,000 hectares is irrigated and therefore is planted at least twice and sometimes three times a year, hence the total harvested area per year is approximately 3.15 million hectares. Every year, approximately 10,000 hectares of rice land is converted into housing and business complexes. Thus to maintain national rice output, rice yields per hectare must increase to supply the additional 1.5 million Filipinos added to the population every year or other land must be found for wet rice cultivation or increased imports will be necessary.³³ Rice production increased at an average rate of 3.12 percent yearly, specifically in the period 1990 through 1994. Total production in 1987 was some 8.539 million metric tonnes; 9.319 metric tonnes in 1990; 9.434 metric tonnes in 1993; 10.538 metric tonnes in 1994; and 10.540 metric tonnes in 1995.

Average yield per hectare in 1988 was 2.32 metric tonnes (46.4 sacks, 50 kg each); 2.81 metric tonnes in 1990; 2.85 metric tonnes in 1992; and 2.89 metric tonnes in 1994. Total area harvested in 1987 was 3.2 million hectares; 3.3 million hectares in 1990 and 1993; and 3.7 a million hectares in 1995.

For this book we analyzed the rice production data of 1991 so as to coincide with other data sets. The 1991 report of PHILRice provided data on the production, area harvested and yields of both modern and indigenous, locally-derived rice varieties. Since production of indigenous rice is not practiced in many provinces, the

³³ It is a widely held view that the lands with potential for conversion to rice cultivation are few across the archipelago. Those lands not already cultivated would require heavy investment in land preparation and irrigation infrastructure. Currently such investment is economically unviable.

analysis included only the data of modern rice varieties in two cropping seasons by province.

In terms of production, the province of Nueva Ecija ranked first with 406,218 metric tonnes and 514,013 metric tonnes in the first (January-June) and the second (July-December) crop, respectively (Table n° 5.1). Isabela followed with more than 367,000 metric tonnes in the first cropping season and 316,876 metric tonnes in the second cropping season. Iloilo ranked third, with a total production of 186,860 metric tonnes and 293,519 metric tonnes from the first and second cropping seasons, respectively. The other big rice producers were the provinces of Camarines Sur, Mindoro Oriental, Bulacan and Leyte each producing more than a hundred thousand metric tonnes of rice in a cropping. The provinces of Benguet, Siquijor, Basilan, Camiguin and Lanao Del Sur registered the lowest production ranging from 100 metric tonnes to only about a thousand metric tonnes per cropping season. On the average, the production per province was more than 50 thousand metric tonnes (first cropping) and about 70 thousand metric tonnes (second cropping).

Table n° 5.1 – Estimated rice production, area harvested, yield by cropping season by region, Philippines, 1991.

REGION	PRODUCTION (metric tonnes)		AREA HARVESTED (ha)		YIELD (metric tonnes/ha)	
	Jan-June	July-Dec	Jan-June	July- Dec	Jan-June	July-Dec
CAR	45,827	68,100	14,290	21,590	2.73	2.50
Region I	145,857	716,452	49,790	243,590	2.78	2.54
Region II	1,303,324	1,425,865	324,120	475,310		2.86
Region III	752,651	972,612	163,290	326,100	4.02	2.95
Region IV	432,567	595,641	153,240	200,750	2.75	2.91
Region V	351,911	348,307	148,300	122,000	2.31	2.51
Region VI	470,710	686,876	207,020	233,860	2.30	2.98
Region VII	86,780	103,398	51,550	56,430	1.59	1.70
Region VIII	184,424	164,351	108,180	85,700	1.74	1.96
Region IX	106,645	211,454	35,790	70,010	2.46	2.59
Region X	233,826	261,801	74,000	74,170	3.05	3.39
Region XI	294,109	279,113	83,660	75,710	3.75	3.73
Region XII	154,567	290,923	49,800	83,810	3.10	3.50
ARMM	11,081	28,933	4,350	13,570	2.08	1.72
Total:	3,845,175	5,204,039	1,311,180	1,764,780	37.99	37.83
Mean:	50,594	68,474	17,252	23,220	2.71	2.70

Source: adapted from PHILrice 1991

The big rice producing provinces also registered the most extensive rice areas. Isabela province, for instance, had harvested

rice from about 93 thousand hectares in 1991. Ilo ilo ranked second: 89,690 hectares and 104,760 hectares in the first and second cropping, respectively. Camarines Sur, Nueva Ecija, Leyte and Bulacan produced rice from about 40 thousand to 80 thousand hectares. The provinces of Benguet, Basilan, Siquijor, Camiguin and Sulu had smaller areas ranging from 250 to only about a thousand hectares of rice land. The average area harvested in the 73 provinces was 17,252 hectares (first cropping) and 23,220 hectares (second cropping).

As far as productivity is concerned, again Nueva Ecija ranked first with over 5 metric tonnes per hectare in the first cropping, followed by Davao del Sur and Davao Oriental with slightly less than 5 metric tonnes per hectare. The province of Pampanga also had a high yield of 4.8 metric tonnes per hectare. This was followed by Mt. Province of the Cordillera Autonomous Region with a 4.0 metric tonnes per hectare rice yield. In the second cropping, the high yields were from Davao del Sur (4.6 metric tonnes per hectare), Laguna (4.4 metric tonnes per hectare), Davao Oriental (4.0 metric tonnes per hectare) Surigao del Norte (3.9 metric tonnes per hectare) and Bukidnon (3.7 metric tonnes per hectare). The average yield was 2.71 metric tonnes per hectare in the first cropping and 2.70 metric tonnes per hectare in the second cropping (Table n° 5.1).³⁴

5.4.2 - Corn

Corn is the second most important staple crop in the Philippines. It is planted on over 2.5 million hectares, of which almost three fourths is in Mindanao. It is the staple food of about 20 percent of Filipinos and the main component (about 75 percent) of animal feed in the country. Of the two major corn types white corn is planted more extensively than yellow corn (1.6 million hectares versus 0.9 million hectares) as white corn is preferred for home consumption and yellow corn for animal feed. However, there is substantial yield gap between these two. White corn yields range from 0.5 to 1.8 tonnes per hectare in the farmers' field and 5 tonnes

³⁴ The amount of rice grown in swiddens or dry, upland conditions is inconsequential to overall production for the Philippines.

per hectare in the research station. The highest yield reported is 6.5 tonnes per hectare in a technically assisted farmer's field. On the other hand, yellow corn yields range from 1.5 tonnes per hectare to 8 tonnes per hectare. The experimental yield of some hybrids is as high as 13 tonnes per hectare. The low yields for white corn reduces the national average yield of corn to a very low 1.6 tonnes per hectare.

The Bureau of Agricultural Statistics (BAS) has produced data on 1997 corn production by region (Table n° 5.2). The Philippines had a total of 2,725,825 hectares planted to corn in 1997 (Figure n° 5.2). Southern Mindanao ranked number one in corn area with a total of 481,989 hectares followed by Central Mindanao (385,285 hectares), ARMM (314,026 hectares), Northern Mindanao (303,898 hectares), Cagayan Valley (261,253 hectares) and Central Visayas (243,371 hectares). In general, the regions with large areas planted to corn also produced large quantities of corn. These areas produced more than half a million metric tonnes of corn in one cropping season. These regions included Central, Southern and Northern Mindanao, Cagayan Valley, and ARMM. The regions of Ilocos, Eastern Visayas, Caraga, CAR and Central Luzon registered the smallest areas planted to corn.

In terms of productivity, Central Luzon registered 3.3 tonnes per hectare, followed by Ilocos (3.19 tonnes per hectare), Cagayan Valley (2.56 tonnes per hectare) and Northern Mindanao (2.12 tonnes per hectare). The lowest corn yield reported was in the Central Visayas with only 0.59 tonnes per hectare. On average, corn yield for all varietal types for the country was only 1.59 tonnes per hectare.

Table n° 5.2 – Ranking of regions in terms of yield, area and production of corn in the Philippines 1997.

Regions	AREA		YIELD		TOTAL PRODUCTION	
	Ha.	Rank	Tonne/Ha	Rank	metric tonnes	Rank
Philippines	2,725,825		1.59			
Southern Mindanao	481,989	1	1.35	9	651,545	4
Central Mindanao	385,285	2	1.76	6	684,328	1
ARMM	314,026	3	2.09	5	657,532	3
Northern Mindanao	303,898	4	2.12	4	643,271	5
Cagayan Valley	261,253	5	2.56	3	669,921	2
Central Visayas	243,371	6	0.59	15	142,908	8
Western Mindanao	221,676	7	0.83	13	184,819	7
Bicol	115,815	8	0.86	12	99,157	10
Western Visayas	92,215	9	0.87	11	80,552	11
Southern Tagalog	81,500	10	1.37	8	111,823	9
Ilocos	62,662	11	3.19	2	199,729	6
Eastern Visayas	61,343	12	0.72	14	44,307	14
Caraga	54,444	13	0.92	10	49,875	13
CAR	24,892	14	1.68	7	41,910	15
Central Luzon	21,456	15	3.3	1	70,740	12
Source: BAS, 1997						

5.4.3 - Coconuts

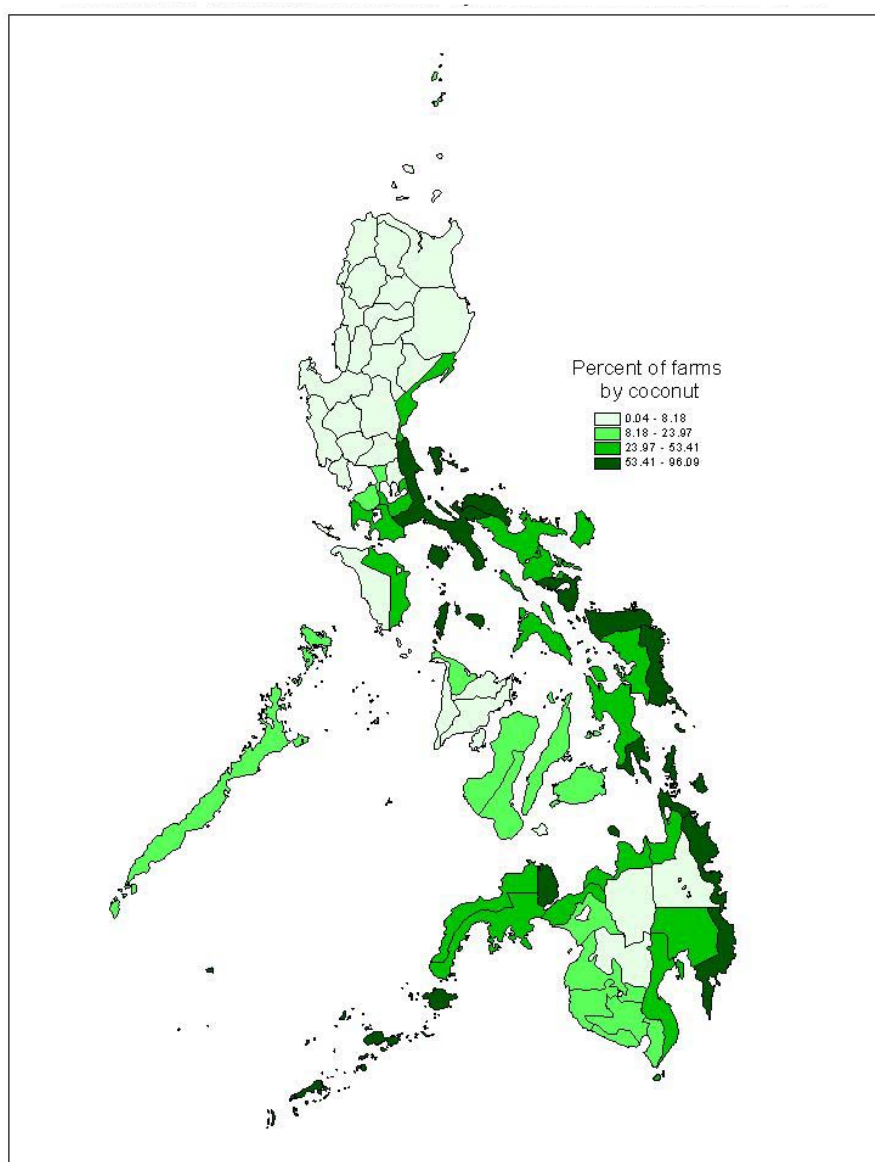
Copra is one of the export products of the Philippines that has gained world-wide popularity. It is one of the competitive products for the world market primarily for industrial usage.

Approximately one third of the population of the rural Philippines depends on coconut production and related industries for their livelihood (Figure n° 5.2). World copra production in 1965 amounted to 3.26 million metric tonnes, about 44 percent of which was produced in the Philippines. However, latest estimates show that percentage economic contribution of coconuts to the overall economy of the Philippines is declining due to low crop productivity and the effect of 'free trade' liberalization including the emergence of the alternative oil palm planted extensively in Malaysia and Indonesia.

Thousands of hectares of coconut farms nation-wide are unproductive. The reduction in yield of copra is due partly to poor farming practices that aggravated soil erosion and degradation. Most coconut farms are located on slightly to very steeply sloping land that is often vulnerable to erosion and landslides. It is projected that the area of poor growing coconut trees will probably increase due to farmers' lack of information on scientific coconut farming practices.

The province of Quezon of Region VI (Southern Tagalog) ranked first in the volume of copra produced in 1991 (1,184,712,347 kg) from four harvests (Table n° 5.3). The province of Zamboanga del Sur ranked second with a total production of more than half a million kg followed by Leyte (347,190,138 kg), Misamis Oriental (259,745,000 kg) and Surigao del Norte (224,145,090 kg). Some of the low producers included Benguet, Ifugao, Quirino, and Pampanga. Quezon province also reported the greatest number of productive coconut trees (42,153,342). Other big coconut producing provinces include Camarines Sur, Leyte, Northern Samar, and Zamboanga del Sur. Benguet being a high altitude province registered the smallest number of productive trees (7,404).

Figure n° 5.2 – Percent of farm area planted to coconuts by province, Philippines 1991



In terms of productivity, Batangas ranked first (53 kg/tree/4 harvests per year, or about 13 kg/tree/harvest which is equivalent to

40 nuts/tree). It was followed by Antique (49 kg/tree/year), Misamis Oriental (48 kg/tree/year), Surigao del Norte (45 kg/tree/year) and Capiz (44 kg/tree/year).

Table n° 5.3 – Coconut Productivity in Kilograms by Regions and Province, Philippines, 1991.

Region/Province	Volume of Production (kg) 4 harvests per year	No. of Trees of Productive age (compact & scattered)	Avg. Productivity (kg/ Productive Tree) 4 harvests per year
Region CAR	1,472,165	139,856	8.63
Region 1 - Ilocos	3,503,120	539,190	26.5
Region II - Cagayan Valley	19,654,677	1,146,006	11.63
Region III - Central Luzon	1,719,170	614,156	3.22
Region IV - Southern Tagalog	1,854,268,773	63,767,928	32.04
Region V - Bicol	736,749,072	38,734,958	15.25
Region VI - Western Visayas	213,520,961	6,410,910	32.80
Region VII - Central Visayas	325,249,831	10,949,672	29.43
Region VIII - Eastern Visayas	773,697,396	43,316,621	17.79
Region IX - Western Mindanao	961,651,567	25,540,107	34.37
Region X - Northern Mindanao	797,808,650	20,932,102	32.27
Region XI - Southern Mindanao	3,692,250,375	41,167,686	87.15
Region XII - Central Mindanao	530,806,041	10,295,927	27.2
ARMM - Autonomous Region	753,249,706	12,634,769	73.15

5.5 - Rice production, food security and malnutrition

In the Philippines, the continued focus on the technological aspects of rice production research seems to have failed to have the desired impact (and hence curb rice imports) i.e. the primarily uni-dimensional approach of the International Rice Research Institute (hereafter IRRI) to increase productivity through technological innovation fails to recognize the complexity of the problem. Indeed one goal should be to first understand the nature of the problem. Research conducted as part of this CICRED initiative, points to some interesting outcomes. First, there appears, depending on how one measures self-sufficiency, to be more than adequate production to feed the nation's population at a per capita level of 98 kilograms of rice per year over the long term. The per capita consumption rates were derived by Mears (1971) from Philippine statistical sources. However, a caveat is required. This self-sufficiency in production assumes that national production figures are accurate and that climatic conditions are favorable over the longer term. Unfortunately, extended droughts and cyclonic storms inevitably tax the country's self sufficiency (see Table n° 5.4, particularly the year 1998). Datt and Hoogeveen (2003) found that the extended drought of 1998 had a greater impact on the Philippine economy and poverty than the Asian financial crisis. Moreover, underpinning and, rarely addressed in discussions of self-sufficiency, are the country's rice markets. Anecdotal evidence exists of a failure to conserve during periods of relative prosperity in production for times of hardship (Urich 1996). This trend applies to local peasant economies and the nation as a whole. Hence storage and distribution are major issues that need further exploration.

Table n° 5.4 – Rice production versus consumption and total demand (in metric tonnes)

	1992	1993	1994	1995	1996	1997	1998
Rice production	5970300	6132200	6850000	6852000	7334000	7325000	5560000
Apparent consumption	5822100	6032200	6169000	6563000	7151000	7205000	6857000
Total demand	6396700	6591900	6792000	7191000	7821000	7868000	7377000
Balance vs. consumption	+148200	+100000	+681000	+289000	+183000	+120000	-1297000
Balance vs. total demand	-426400	-559700	+58000	-339000	-534000	-534000	-1817000
Rice importation	640	201610	160	263250	862380	722400	2170830

Source: Lim 2000

The issues surrounding rice production, its distribution and relationship with malnutrition are compounded in the context of corn and areas dominated by corn production. Corn production has been steadily declining. Over the 1990s overall production was halved from 2.7 metric tonnes in 1992 to 1.1 metric tonnes in 1998 (also a severe drought year) and, as with rice, evidence suggests that supply has not been able to keep pace with demand (Lim 2000). Massive imports of white corn have become commonplace in an attempt to satisfy demand. In 1992 only 174,000 metric tonnes of white corn was imported. This increased to a high of 1.1 million metric tonnes in 1996 and has since declined to 462,000 metric tonnes in 1998 (Lim 2000). White corn production is greatest in Mindanao and is a primary nutritional source for a large percentage of the island's population. However white corn demand in the rest of the country is largely a component of the industrial feed industry for industrial and domestic livestock production. Disaggregating the corn demand for these two sectors is not possible given the current forms of reporting corn demand.

5.6 - Land tenure status and society issues

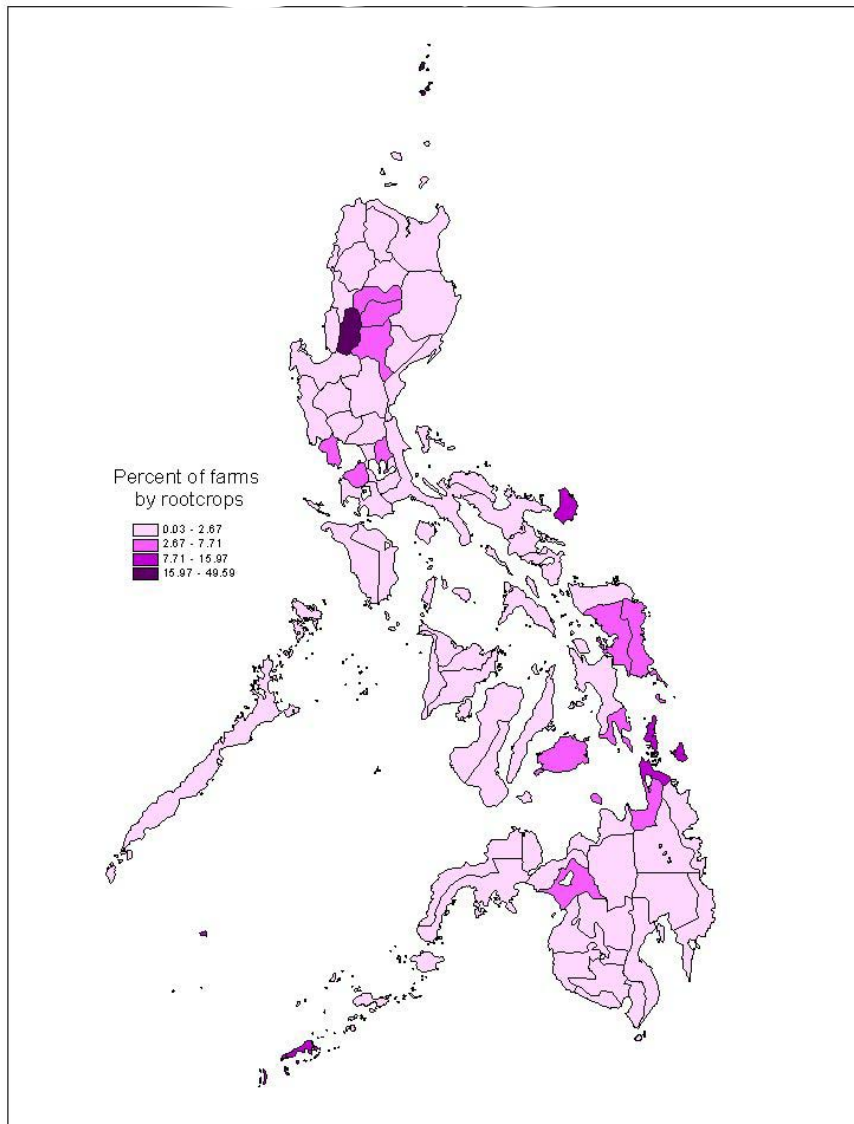
The 1991 agriculture census showed that the 14 regions differed in the total farm area (hectares) allocated to the cultivation of important field and industrial crops, namely: rice, corn, rootcrops, vegetables, banana and coconut. The data further showed that five types of tenure of farm parcels exist, with a consistently higher percentage of ownership than tenancy, leased, rent-free and other tenure systems.

Among the 76 provinces growing rice, Albay leads in terms of hectarage (232,510) followed by Nueva Ecija (207,441) and Iloilo (191,162). It is worth noting that Central Luzon is the leading region in the total farm area for rice production. The national total farm area under rice is 3,624,935 hectares. Of this area, 60.3 percent is owned, 26.9 percent tenanted, 8.5 percent leased, 2.8 percent rent-free and 1.4 percent classified under other tenurial arrangements (Republic of the Philippines 1991).

The second staple food of the Filipinos is corn. The demand for this crop as human food and feed for livestock is expected to grow in the coming years. It is estimated that 70 percent is produced in Mindanao. In fact, the three leading provinces are in Mindanao namely: Bukidnon, Cotabato and Zamboanga del Sur with a total farm area of 215,081; 148,959; and, 141,691 hectares, respectively. Presently, the total farm area reached 2,262,090 hectares. Of this 1,473,611 hectares (65.5 percent) are recorded as owned, 23.8 percent tenanted and only 3.3 percent leased.

Rootcrops, considered by many in the Philippines as a substitute food-source to rice and corn, also play an important role in the livestock industry. However, despite its importance as a source of feed for livestock, only 161,149 hectares is utilized throughout the 14 regions (Figure n° 5.3). Of the total area 59.1 percent is owned, 22.4 percent tenanted, and only 4.2 percent leased. Albay is the leading rootcrop producing province in Region V with 18,171 hectares followed by Surigao del Norte with 10,340 hectares.

Figure n° 5.3 – Percentage of farm area planted to rootcrops by province



The province of Benguet leads in the total farm area (4,527 hectares) for vegetable production. This is followed by Nueva Ecija and Laguna with 3,056 and 2,210 hectares, respectively. The total

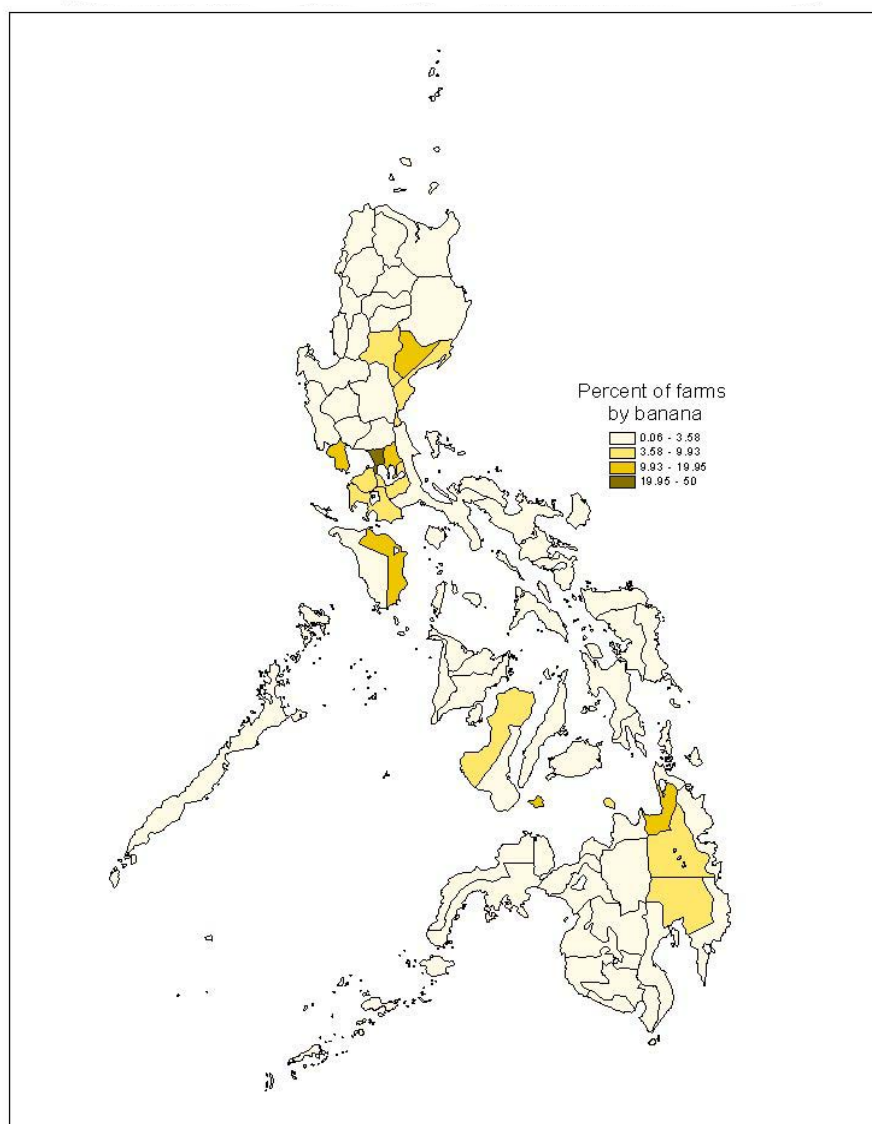
farm area for vegetables throughout the regions is only 38,164 hectares. There is a shortage of vegetables to sufficiently supply the current population. This has not resulted in large imports or intensified production, with the exception of market gardens in and around the largest urban centers. Regardless, the supply is still deficient and people simply go without a diverse and adequate quantity of vegetables in their diet.

Coconut is another very important industrial crop and occupied 3,194,229 hectares in 1991. Of this figure 66.17 percent is considered owned (this includes land that is owned outright with a registered title and also land claimed through tax declaration only (as described in Chapter Two), 28.56 percent tenanted, 14.22 percent leased, 1.55 percent rent-free, and 0.95 percent under other tenure systems. The three highest coconut-producing provinces are Albay (525,641 hectares), Quezon (298,891 hectares) and Zamboanga del Norte (125,720 hectares).

Bananas are another export product of the Philippines (Figure n° 5.4). The total farm area cultivated to bananas is 198,585 hectares with Davao (18,240 hectares) as the leading province closely followed by the National Capital Region³⁵ (17,291 hectares), and Laguna (13,993 hectares).

³⁵ Admittedly, the NCR would seem an unlikely area to be so highly ranked for banana production. However, the region is large and includes extensive open areas devoted to home gardens. Bananas figure prominently in these home gardens.

Figure n° 5.4 – Percentage of farms planted to banana by province



Of the total of 198,585 hectares devoted to bananas 60.24 percent is owned, 14.44 percent tenanted, 13.84 percent leased, 8.37 percent rent-free and 3.09 percent under another form of tenurial system.

Based on the data of the total farm area, crops or type of farm utilization by provinces and by regions as well as the tenurial status of the farm parcels, it is obvious that (in descending order) rice, coconut, corn, banana, rootcrops and vegetables are the leading crops. Furthermore, there is a consistently higher percentage of owned land than tenanted and leased land. However, tenanting and leasing persist as fairly common tenurial arrangements despite the longer term attempts by government to implement comprehensive agrarian reform programs to end them.

5.7 - Total number of farms, type of farm and land tenure

The 1991 agricultural census enumerated the total number of farms by province/region, by crop type and tenurial systems operating on a per parcel basis. It is noteworthy that the different provinces/regions differed in landuses and degree of tenurial systems.

The most common food and industrial crops grown by almost all provinces are rice, corn, vegetables, rootcrops, banana and coconut. Rice and corn are the staple foods of the Filipino. The availability of these commodities at affordable prices is important for society's existence. A typical farmer in the province preferred to grow rice even in small bunded paddies with scarce irrigation water even if the price received for the produce barely covered the costs of production. The importance of the crop for home consumption was a determining factor in continuing to produce in spite of low farm gate prices paid for surplus.

Coconut provided many farmers with a good source of livelihood at the time when the price of copra in the world market was competitive. However, today copra processing is no longer attractive. It was observed that the crop is grown in almost all provinces since it is adaptable to a wide range of soils.

Rice and corn occupy the highest total number of farms. In fact, rice is grown on 2,011,998 farms (48 percent of the total) while corn is produced on 1,109,950 farms (27 percent of the total). On the other hand, coconut (768,054), rootcrops (137,106), banana

(93,158), and vegetables (36,435) have fewer number of farms compared to the two staple crops. The three highest rice producing provinces are Nueva Ecija with 180,474 farms, Pangasinan with 134,295 farms and Iloilo with 115,069 farms. For corn, it was noted that Cebu with 140,642 farms led the other provinces of Bukidnon with 77,455 farms followed by Negros Oriental with 72,072 farms.

Generally, the ownership of parcels (over, for example, tenancy) was the most common system for either all types of farms or crops by province (Table n° 5.5). For instance, the total number of farms for rice nationwide is 2,011,998 while the total of all kinds of tenurial systems of rice parcels is 3,995,894 (note that a farm can consist of multiple parcels). This simply means that the combined total of tenurial systems of parcels far exceeded the total number of farms available for cropping whether by province or by region. This strongly suggests that farms are either highly subdivided or fragmented and are getting smaller per farmer apparently due to a complex set of adaptations to population pressure, inheritance patterns and a closing of the frontier. Furthermore, a consistent higher incidence of tenancy (rent-free rather than leased system) exists for almost all types of crops in all provinces. This observation exposes the failure on the part of the government in implementing CARP, designed to benefit tillers of the soil, who are mostly poor farmers.

Table n° 5.5 – Total Number of Farms, by Type of Farm, by Tenure of Parcels, and by selected Provinces: Philippines 1991.

PROVINCE/ TYPE FARM	TOTAL NO.OF FARMS	TENURE OF PARCELS				
		Owned	Tenanted	Leased	Rent Free	Others
Abra						
Rice	19,052	37,867	15,385	1,131	1,553	207
Corn	1,166	2,352	1,493	30	99	23
Root crops	16	25	2	-	2	-
Vegetables	100	165	34	-	20	2
Banana	60	131	14	-	2	-
Coconut	12	18	-	-	2	-
Kalinga- Apayao						
Rice	22,401	49,705	6,326	1,309	5,420	1,133
Corn	1,761	2,770	655	234	555	82
Root crops	135	299	8	-	20	-
Vegetables	120	170	47	-	42	23
Banana	894	1,575	243	10	187	29
Coconut	50	86	-	-	7	2
Pangasinan						
Rice	134,295	186,660	100,284	15,055	18,936	1,521
Corn	2,972	3,778	2,259	431	544	29
Root crops	498	810	166	23	72	10
Vegetables	1,228	1,492	413	96	177	22
Banana	1,914	1,907	115	15	212	8

Coconut	1,393	1,453	106	30	152	4
Cagayan						
Rice	66,277	107,803	48,788	7,489	14,951	3,025
Corn	20,287	34,732	15,708	1,987	3,051	762
Root crops	686	700	84	6	224	4
Vegetables	855	789	159	23	311	18
Banana	1,348	1,388	201	47	528	32
Coconut	1,307	1,886	79	6	211	24
Isabela						
Rice	67,718	112,631	23,384	14,029	14,125	3,493
Corn	52,708	105,789	24,806	5,322	7,700	1,925
Root crops	218	288	34	26	64	15
Vegetables	352	331	45	24	95	13
Banana	1,845	3,030	125	49	324	30
Coconut	595	1,034	15	10	70	9
Nueva Vizcaya						
Rice	23,581	34,720	10,205	1,845	3,375	979
Corn	4,238	5,721	1,014	203	1,335	204
Root crops	20,459	4,431	84	87	759	104
Vegetables	821	785	95	51	278	29
Banana	1,191	1,345	53	18	274	319
Coconut	219	192	14	10	28	-

Occidental Mindoro						
Rice	30,155	34,069	10,544	2,549	3,958	1,177
Corn	3,324	4,190	299	37	780	70
Root crops	382	282	76	11	193	2
Vegetables	95	103	9	-	21	2
Banana	614	768	67	13	178	18
Coconut	425	530	51	19	61	9
Palawan						
Rice	31,096	38,939	4,382	1,222	2,285	378
Corn	5,972	7,498	1,119	99	452	37
Root crops	523	540	56	10	101	4
Vegetables	145	148	25	2	42	7
Banana	972	1,116	53	6	122	6
Coconut	7,873	10,650	646	224	415	71
Iloilo						
Rice	115,069	124,380	49,551	37,191	35,538	2,982
Corn	7,841	8,274	3,869	1,331	3,384	239
Root crops	1,456	584	83	232	1,387	24
Vegetables	933	751	200	138	290	28
Banana	2,808	1,763	410	195	1,424	74
Coconut	4,473	4,650	597	360	986	86
Negros Occidental						
Rice	48,410	44,151	12,430	8,745	34,274	920
Corn	36,263	26,994	14,804	2,676	19,314	671
Root crops	1,543	1,075	270	71	1,025	10
Vegetables	472	307	43	28	463	7
Banana	4,521	2,582	498	181	4,330	78

Coconut	3,898	4,654	408	226	990	34
Cebu						
Rice	2,774	3,546	3,034	164	330	61
Corn	140,642	122,761	114,932	3,332	14,056	1,132
Root crops	2,884	1,704	2,914	122	348	9
Vegetables	1,579	966	1,774	163	224	17
Banana	2,276	1,814	922	74	310	20
Coconut	13,183	18,836	5,017	225	802	151
Leyte						
Rice	63,404	62,055	57,502	7,086	11,017	950
Corn	23,370	14,083	23,046	931	6,195	186
Root crops	6,644	3,452	4,222	490	2,686	145
Vegetables	804	419	308	44	256	10
Banana	2,814	1,782	1,491	173	737	43
Coconut	45,427	51,508	29,435	2,621	6,219	741
Southern Leyte						
Rice	9,992	15,337	10,116	924	2,700	94
Corn	1,027	845	905	134	363	4
Root crops	5,094	3,938	3,351	585	2,621	21
Vegetables	205	148	69	26	83	-
Banana	1,456	1,456	889	160	468	6
Coconut	18,893	31,947	13,570	1,661	5,619	140
Bukidnon						
Rice	20,015	22,596	7,586	2,542	3,601	960
Corn	77,455	88,935	25,322	6,992	16,166	3,168
Root crops	1,313	1,279	353	148	375	51
Vegetables	449	449	69	100	161	25
Banana	404	468	34	14	128	26

Coconut	691	1,025	93	32	88	29
Davao Oriental						
Rice	5,023	4,999	1,745	927	834	72
Corn	16,514	12,804	5,124	383	4,862	388
Root crops	161	52	19	-	131	-
Vegetables	69	33	16	2	45	-
Banana	325	199	55	16	167	13
Coconut	21,806	27,512	5,389	826	1,951	334

A regional view of changes in the percentage of farms that were fully owned over the period from 1960 through to 1990 is telling (Table n° 5.6). The case of Mindanao reflects a classic migratory farming situation whereby the early settlers became land owners and this was reflected in the relatively high levels of farm ownership in the earliest phases of widespread in-migration in the 1960s reflected in 1970 data. However from 1970 the percentage of fully owned farms fell to the point that by the 1990s the profile of the percentage of fully owned farms very closely mirrored that of the source area for migrants. Krinks (1970; 1974) in his important papers on migration in rural Mindanao, particularly his paper, 'Old wine in a new bottle', foretold this story as the settlers from the Visayas imported both the best and worst characteristics of their culture, including land tenure relations.

In the important rice producing agricultural zone to the north of Manila land tenure has always been a contentious issue (Fegan 1982; Kerkvliet 1990). Full ownership of land expanded slightly to raise the region out of the lowest category based on 1980 data but slipped back to the lowest category by the 1990 Census of Agriculture (Table n° 5.6 and Figures n° 5.5 and n° 5.6).

Table n° 5.6 – Percentage of farms fully owned for selected Provinces of the Philippines, 1960 to 1991 (Source: Census of Agriculture, 1991).

Province	1960	1971	1980	1991
Abra	61.0	60.0	61.2	44.6
Kalinga-Apayao	81.0	82.6	91.4	59.3
Pangasinan	28.1	33.8	49.9	36.2
Batanes	95.1	82.3	86.3	57.8
Cagayan	37.0	40.2	52.5	32.6
Isabela	46.5	57.8	58.1	46.0
Nueva Vizcaya	44.7	61.1	72.6	51.6
Occidental Mindoro	49.7	58.6	76.0	49.8
Palawan	64.7	82.6	92.2	74.4
Iloilo	35.7	48.8	57.1	39.8
Negros Occidental	57.9	61.4	72.5	55.3
Cebu	38.3	56.9	58.2	45.5
Leyte	46.1	54.6	58.1	35.4
Southern Leyte	51.4	64.7	66.4	29.8
Bukidnon	71.6	68.8	75.7	52.7
Davao Oriental	78.9	85.3	83.6	58.6
TOTAL COUNTRY	53.2	62.9	66.8	48.7

Figure n° 5.5 – Percentage of fully owned farms by province, 1960 – 1990

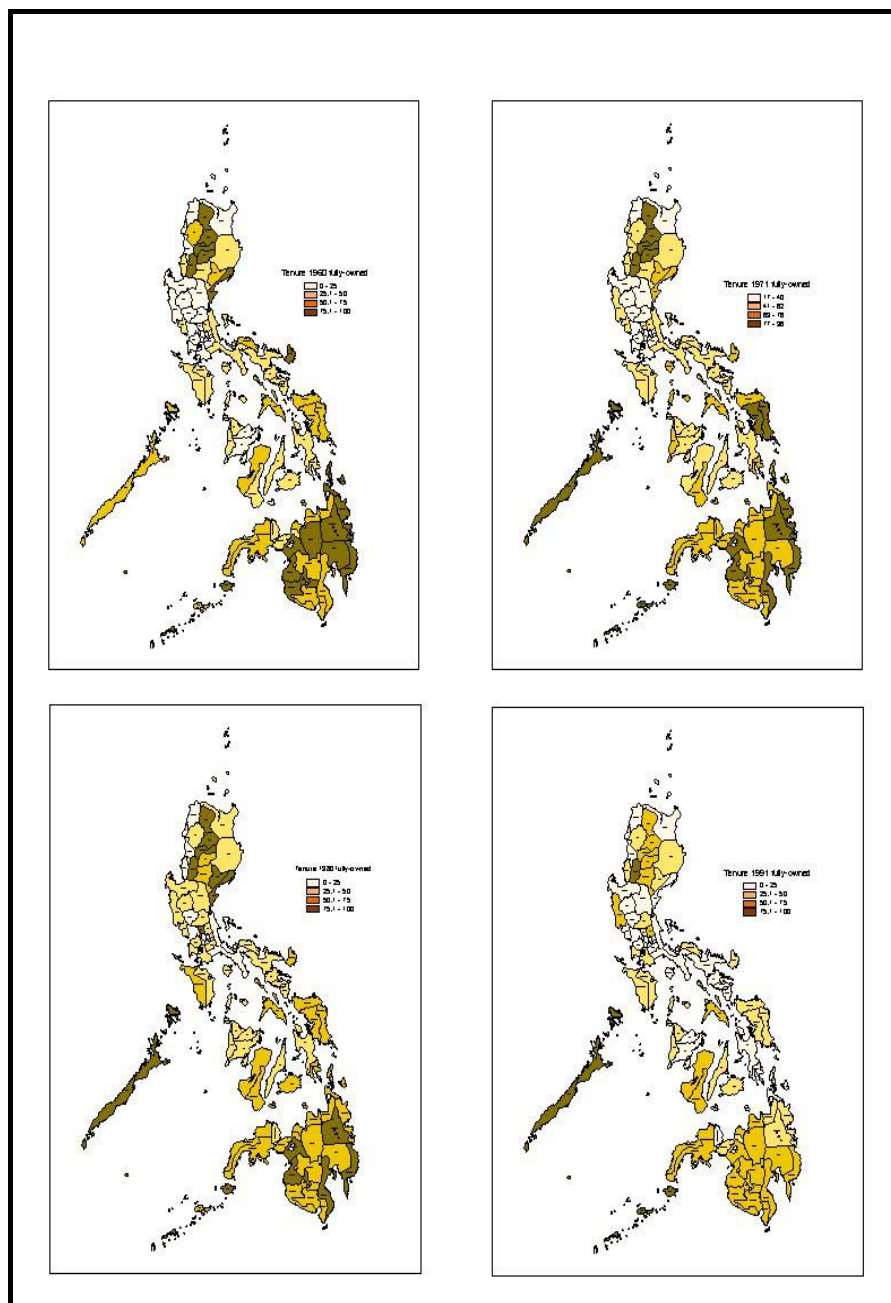
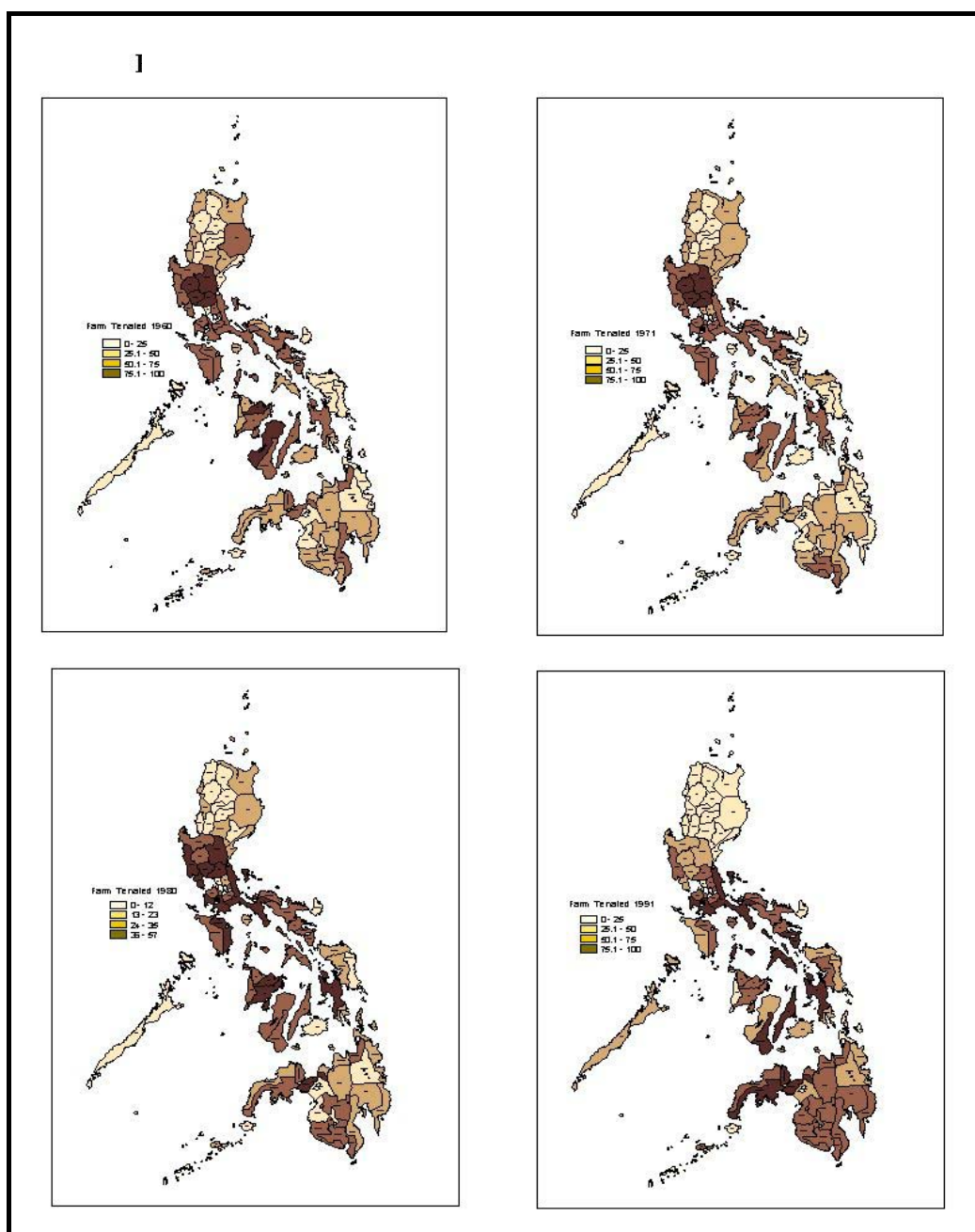


Figure nº 5.6 – Percentage of tenanted farms by province,
1960 – 1990



5.8 - Tenure and nutritional status

A World Bank Development Report states that 30 percent of Filipino children under the age of five suffer from malnutrition (World Bank 1998). The spatial distribution of malnutrition is complex and related to an array of variables. In this study we have analyzed malnutrition in the context of land tenure and food productivity, and predominant food production systems at the provincial level. Three types of malnutrition data are readily available for the Philippines: these relate to stunting, wasting and underweight in children less than five years old.

We have grouped provinces by the prevalence of the three aforementioned variables (Figure n° 5.7). Thirty-five of the country's 74 provinces fall into the 'severe' malnutrition category³⁶ and this level of malnutrition occurs in three pockets: Central Mindanao and the western and northeastern sections of that island, the northern and eastern part of the Visayas, and in the northern part of the island of Luzon. In Tarlac, in the Southern Tagalog region, 34.5 percent of children show stunting and 39.5 percent are underweight. Provinces with similarly high levels of malnutrition include Aurora, Cataduanes, Masbate, of the northern part of the country and Aklan, Antique, and Capiz of the western part of the Visayas. In the Central and Southern Philippines the most severe levels of malnutrition are found in the provinces within Leyte and Samar. Western Mindanao (the Zamboanga Peninsula) is also hard hit by severe malnutrition. Surigao, Sultan Kudarat and Cotabato suffer from high levels of stunting, wasting and underweight children. The worst case of malnutrition is found in Southern Leyte where 50.2 percent of children are stunted, 52.3 percent are underweight and 11.7 percent are wasted.

A second level of malnutrition has been defined as provinces where any two of the three identified measures of malnutrition prevail. A further 28 provinces have children suffering from two categories of malnutrition. Of the remaining provinces only five

³⁶ 'Severe' malnutrition, as defined by this study occurs in Provinces where more than 25 percent of the population suffers from stunting and is underweight and more than 5 percent exhibits wasting.

have their youth population suffering from just one type of malnutrition. Only the provinces of Batanes, Batangas, Cavite, and Nueva Vizcaya do not have children identified as malnourished by this survey of malnutrition. The first three of these provinces are located close to Manila and have a high proportion of the population engaged in non-agricultural activities. In the case of Nueva Vizcaya the population is on the boundary between plain and mountain environments and has excellent supplies of irrigation water for agriculture.

There appears to be only a weak relationship between levels of malnutrition and land tenure status. Intuitively one might expect provinces with higher rates of malnutrition to also be areas of high tenancy. As the data in Tables n 5.7 show, this is demonstrated only in a few cases like Southern Leyte and, to a moderate extent, Leyte province, where the prevalence of stunting, wasting and underweight are conspicuously high and the prevalence of tenancy is also relatively high. In other provinces like Kalinga-Apayao and Negros Occidental, some indicators of malnutrition are reported at high levels (stunting and underweight for Kalinga-Apayao, and wasting and underweight for Negros Occidental) but tenancy levels are relatively low (12.2 % and 15.7 %, respectively). Bivariate statistics (Pearson correlation coefficient) presented in Table n 5.8 clearly show that, except in the case of the prevalence of underweight children, the prevalence of acute malnutrition (stunting and wasting) is not associated with tenancy status. The relationship between underweight status of children and tenancy, however, is in the expected direction: where tenancy is low (or land ownership is high) the prevalence of underweight children is likewise low.

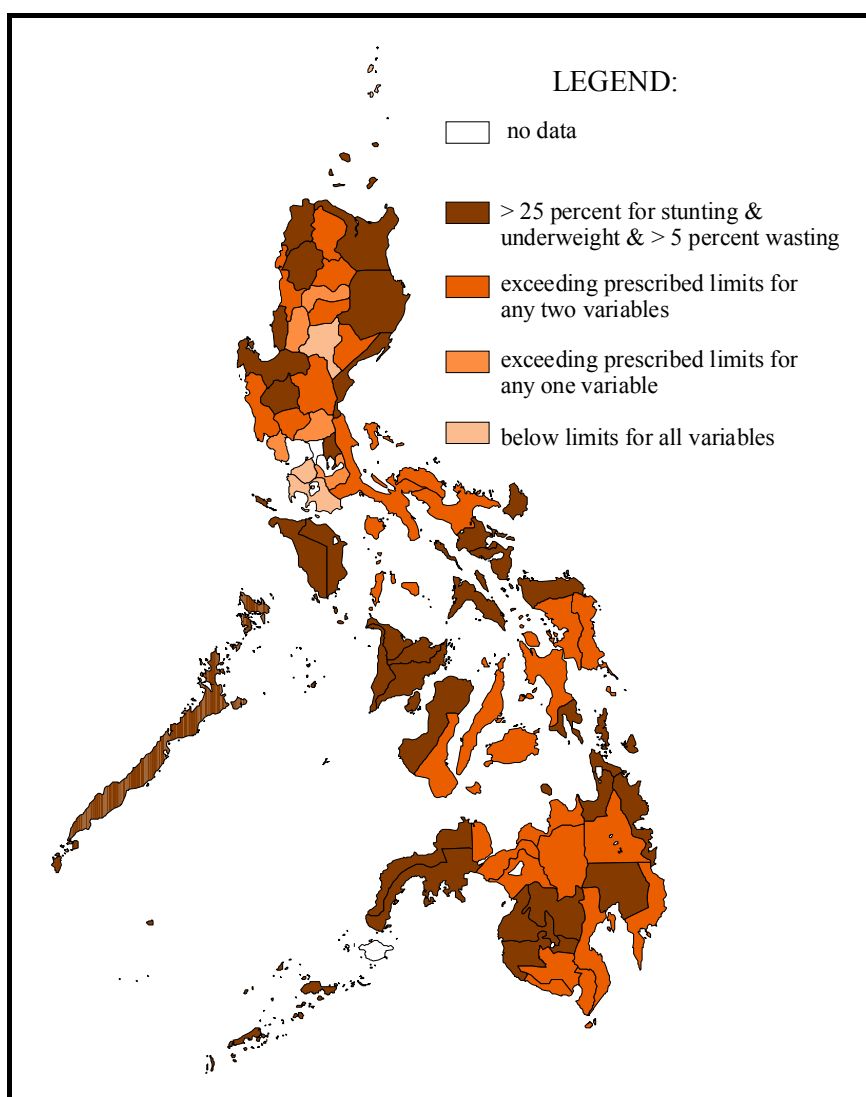
A more refined analysis of the relationship between malnutrition, type of land held and tenancy relationships that takes into account confounding influences, e.g., family composition, income and productivity, might uncover relationships that are even more significant. However, the type of detailed data needed to conduct such an analysis at the national level is currently unattainable.

Table n° 5.7 – Malnutrition and land tenure status for selected provinces.

Province	# of farms	Land Tenure Status*			Malnutrition Measurements**		
		Owned	Tenanted	Leased	% stunted	% wasted	% underweight
Abra	22,087	3,871	7,561 (34.2)	395	33.4	9	34.8
Kalinga-Apayao	39,954	31,691	4,870 (12.2)	1,052	55.7	4.4	46.9
Pangasinan	172,223	90,090	68,019 (39.5)	10,913	27.2	7.7	39.3
Batanes	433	363	48 (11.1)	5	13.3	4.6	16.9
Cagayan	119,140	69,161	38,869 (32.6)	6,481	37	7.3	37.5
Isabela	145,978	99,090	24,998 (17.1)	16,274	29.2	9.4	29.4
Nueva Vizcaya	35,846	24,285	8,046 (22.4)	1,272	24.5	4.6	24.6
Occidental Mindoro	65,362	43,228	15,732 (24.1)	3,477	35.4	6	35.1
Palawan	124,559	110,687	8,003 (6.4)	2,669	34.3	5.8	34.3
Iloilo	194,462	107,670	41,440 (21.3)	33,215	42	6.3	39.3
Negros Occidental	81,250	49,502	12,774 (15.7)	8,612	35.1	11.6	40.8
Cebu	4,411	2,253	1,612 (36.5)	130	41.7	3.5	33.7
Leyte	107,592	51,905	48,260 (44.9)	4,870	38.3	4.6	35.9
Southern Leyte	12,092	6,958	4,530 (37.5)	330	50.2	11.7	52.3
Bukidnon	49,841	35,172	8,938 (17.9)	3,073	44.7	1.7	30.3
Davao Oriental	11,241	7,751	1,959 (17.4)	1,027	40.3	4.1	30.1
*Will not be equal to total #of farms due to the omission of such minor categories as 'rent-free' and 'other'.							

Source: Malnutrition data** from the Food and Nutrition Research Institute (FNRI), Fifth National Nutrition Survey, Republic of the Philippines 1998.

Figure n° 5.7 – Prevalence of stunting, wasting and underweight for the provinces of the Philippines.



Source: Food and Nutrition Research Institute (FNRI), Fifth National Nutrition Survey, Republic of the Philippines (1998).

Table n° 5.8 – Pearson's correlation coefficients for selected 1990 agricultural labor force, land tenure and poverty indicators and 1998 malnutrition indicators: Philippines

	Stunting	Wasted	Underweight
Sex ratio of HHH in agric.	-0.2638	0.3474	0.0776
Sex ratio of agric. LF	0.3163*	0.2830*	0.0322
Poverty incidence 1991	0.5115***	-0.1174	0.3082**
Percent of farm idle	-0.2741*	-0.1062	-0.2512*
Percent of farm owned	0.0370	-0.1740	-0.3509**

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

While tenure status displays only a weak relationship with malnutrition, the extent of use of agricultural land is clearly associated with levels of malnutrition, but in the unexpected direction. In provinces where large proportions of farmlands are left idle/uncultivated, the prevalence of stunted and underweight children is low. This might relate to the case study by Gultiano and Ulrich (2000) where those who left land idle had other sources of income and generally were doing better economically than those that farmed their land continually but hence degraded it.

In conformity with expectations, provinces where the incidence of poverty is high also have high levels of malnutrition (stunting and underweight). With respect to the sex composition of the agricultural labor force, provincial data reveal that high sex ratios in the agricultural workforce are associated with higher levels of stunting and wasting among children. It is possible that in areas where more women work in agriculture, children are provided with

Table n° 5.9 – Provincial Nutritional Status and Rice Production Capability for Selected Provinces

Province	Nutritional Status			Severity of malnutrition	Rice Production*	
	% stunted	% wasted	% underweight		Deficit	Surplus
Abra	33.4	8.9	34.8	2	125156	
Kalinga-Apayao	55.7	4.4	46.9	2	109321	
Pangasinan	27.2	7.7	39.3	2		2736992
Batanes	13.3	4.6	16.9	3	14180	
Cagayan	37	7.3	37.5	1		594003
Isabela	29.2	9.4	29.4	3		4425124
Nueva Vizcaya	24.5	4.6	24.6	3		408806
Occidental Mindoro	35.4	6	35.1	1		677260
Palawan	34.3	5.8	34.3	1		1165024
Iloilo	42	6.3	39.3	1	733985	
Negros Occidental	35.1	11.6	40.8	1	949049	
Cebu	41.7	3.5	33.7	3		1857360
Leyte	38.3	4.6	35.9	1	1447512	
Southern Leyte	50.2	11.7	52.3	1	317565	
Bukidnon	44.7	1.7	30.3	2	623652	
Davao Oriental	40.3	4.1	30.1	2		1534104

* Number of people that are not supported (deficit) or those that can be supported in excess (surplus) of the provincial population for rice production at a consumption rate of 98 kilos per capita per year. Numbers in bold reflect those provinces with moderate to severe malnutrition and surplus rice production.

better nutrition. But how these relationships are played out in the micro level, however, needs further study.

The relationship between food production systems and malnutrition is murky in the Philippines. This can be exemplified by the relationship found between rice surplus provinces (i.e. provinces that produce a surplus of rice beyond physiological needs of the province's population) and levels of malnutrition. Once again, intuitively, one would not expect to have medium to high levels of malnutrition in areas that produce rice above physiological demand. Yet in many provinces this is not the case. Table n° 5.9 details the relationship between nutritional status and the physiological capacity for each province to provide the minimum annual per capita rice requirement (98 kilos as defined by Mears (1971)).

At least 23 provinces produce a surplus of rice, beyond the physiological requirements of its resident population, yet they still have greater than 25 percent of their population suffering from at least two measures of malnutrition (Table n° 5.9). Clearly, the relationship between rice production and malnutrition is distorted and cannot be correlated. More detailed analysis, at the local level will shed additional light on this important aspect of food security. Based on the experience of the authors we suspect that much of the explanation lies in the understanding of the rice market in the Philippines including the seasonality of production, the indebtedness of producers and the need for them to market rice rather than consume it.

5.9 - Relationships between tenure, productivity and population change

This section explores, in statistical terms, the relationships of land tenure, agricultural productivity, and population growth. A common but somewhat contentious supposition of the link between tenure and productivity expounded in earlier chapters is that improvements in land tenure security will result in increases in agricultural productivity. Similarly contentious is the view that population pressure, resulting from rapid population growth, will erode land tenure security, which in turn, will lead to a deterioration

in agricultural productivity, and thus, food security for the population.

Table n° 5.10 – Mean, Standard Deviation, Minimum and Maximum Values of Agriculture and Population Indicators

Indicator	No. of Obs.	Mean	Std. Dev.	Min	Max
% of farms fully owned, 1991	73	45.4	12.1	22.1	88.1
% of farm area planted temp. crops, 1991	73	52.1	24.1	4.1	90.2
Ave. rice yield (in metric tonnes./ha.), 1991	71*	2.8	0.8	1.0	4.8
Ave. farm size (in ha.), 1991	73	2.2	1.0	0.8	6.1
Sex ratio of HH head in agric., 1990	73	29.1	12.8	3.4	70.7
Sex ratio of agric. labor force, 1990	73	10.5	6.9	1.2	33.4
Age ratio of men in agric., 1990	73	1.4	0.2	0.8	1.8
Pop. growth rate 1980-1990	73	2.1	1.1	0.1	5.6
Pop. growth rate 1990-2000	73	2.1	0.9	0.9	5.8
% of population urban, 1990	73	36.0	17.6	9.0	95.2

* two provinces, Batanes and Tawi-tawi, have no rice production data.

We test these views empirically using provincial census and agriculture data. To measure security of land tenure, we use percentage of farms in the province that were fully owned in 1991. To measure productivity, we use yield data for rice in metric tonnes per province taking the average for the two cropping seasons of

1991. It was not possible to include corn yield in this measure because the data on corn were not disaggregated by province. In addition, we examine average farm size (in hectares per province) and extent of landuse, that is, the percentage of farm area in each province planted to temporary crops—remembering that these represent seasonally planted cereal grains of rice and corn along with root crops.

Table n° 5.11 – Pairwise Correlation Coefficients for Agriculture and Population Indicators

	% farms owned	% area planted to crops	Average rice yield	Average farm size	Sex ratio HHH	Sex ratio agri. LF
% farms owned	1.0000					
% area planted to crops	-.1183	1.0000				
Average rice yield	-0.1091	0.1389	1.0000			
Average farm size	-0.3803*	-.3063*	0.0404	1.0000		
Sex ratio HH head	-0.2124	0.0708	0.2085	-0.0105	1.0000	
Sex ratio agri. LF	-0.3498*	-0.0651	0.2050	-0.1408	0.8545*	1.0000
Age ratio men agri.	-0.0064	0.2525*	0.4093*	0.2646*	-0.2553*	-.3852*
Growth 1980-90	0.2944*	0.2389*	0.4352*	0.2242	0.1149	0.0012
Growth 1990-2000	0.4445*	-0.0252	0.2449*	0.2146	0.1658	0.0252
% urban	-0.0567	0.0411	0.3832*	-0.0199	0.2330*	0.2634*

* p<0.05

	Age ratio	GR '80- '90	GR '90- '00
Age ratio men agri.	1.0000		
Growth 1980-90	0.3043*	1.0000	
Growth 1990- 2000	0.0078	0.6384*	1.0000
% urban	-0.0083	0.4696*	0.5028*

* $p < 0.05$

Population dynamics are measured by the annual growth rates of provinces in 1980-1990 and 1990-2000. Collomb's three indices of agricultural labor force participation discussed earlier (sex ratio of heads of households engaged in agriculture, sex ratio of the agricultural labor force, and the ratio of men in agriculture aged 15-34 to those aged 35-54) likewise enter into the analysis as a part of the population dimension. Finally, to control for a province's level of urbanization, the percentage of the population living in urban areas is used.

Contrary to earlier expectations, bivariate statistics show that provincial variations in rice productivity are not related to the tenure status of farmers. They also are not associated with average farm size and the proportion of farm area in the province that is planted with temporary crops. Instead, rice productivity is affected by the age structure of the male agricultural labor force. Rice yield is higher in areas where there are more young men than older men working in agriculture. It may be noted that planting and harvesting rice is a physically demanding job.

Another unexpected result is that population growth rates are significantly and positively associated with the proportion of farmers

who own their lands. From the standpoint of the entire province, rapid increases in population pose no immediate threat to land tenure security of farmers. More interestingly, the data also show that rice productivity is higher in provinces where growth rates and urbanization levels are high.

To account for the simultaneous influences of tenure status, farm size, labor force characteristics and population growth, we ran a number of regression models to attempt to explain variations in rice productivity across provinces (Table n° 5.12). The first model includes only agricultural variables as explanatory factors; the second includes both agriculture and labor force factors; while the third, includes all variables (agriculture, labor force and population growth) with the exclusion of level of urbanization. The fourth model includes level of urbanization to act as a control variable.

The results of the regressions can best be summarized in Model 4. Consistent with earlier results in the bivariate analysis, tenure status has no effect on rice productivity. Whether the same observation holds true for other agricultural products cannot, unfortunately, be explored with the data at hand.

The sex and age compositions of the agricultural labor force do have some influence on productivity. The predominance of men, and young men in particular, work in favor of rice production. Population growth, despite control for urbanization levels, appears also to enhance productivity.

Table n° 5.12 – Regressions of Rice Productivity and the Agricultural, Labor Force, and Population Variables

	MODEL 1	MODEL 2	MODEL 3	MODEL 4
% farms fully owned	-0.0112	0.0026	-0.0073	-0.0053
% area planted to temp. crops	0.0059	0.0016	0.0013	-0.0008
Average farm size	0.1306	-0.0262	-0.0526	-0.0445
Sex ratio of household head in agri.		-0.0130	-0.0160	-0.0145
Sex ratio of agric. labor force		0.0811*	0.0734*	0.0675*
Age ratio of men in agri.		2.3510*	1.9421*	1.9754*
Growth rate '80-'90			0.2829*	0.2056*
% urban				0.0079
_cons	2.6853*	-1.1312	-0.3405	-0.6188
No. of observations	71	71	71	71
R-squared	0.048	0.360	0.453	0.473
Adj. R-sq	0.005	0.300	0.392	0.404

* p<0.05

The observation that high growth rates are associated with higher agricultural productivity may be brought to question in light of existing theories. An acceptable argument possibly is that rapid population growth could translate into increased local demand for agricultural products which then spurs agricultural production. Without discounting this possibility, we would, however, like to propose another scenario; one that demonstrates the feedback

mechanism and recursive nature of the relationship between agricultural systems and population systems. The regressions in Table n° 5.13 below demonstrate such a relationship.

Table n° 5.13 – Regressions of Population Growth Rate and Agricultural Variables

	Growth Rate 1990-2000	
	Model 1	Model 2
% of farms fully owned, 1991	0.0366*	0.0362*
% of farm area planted temp. crops, 1991	0.0002	0.0008
Average farm size (in ha.), 1991	0.0112	0.0345
Ave. rice yield (in metric tonnes./ha.), 1991	0.3250*	0.1076
% urban, 1990		0.0260*
_cons	-0.4645	-0.8586
No. of observations	71	71
R-squared	0.279	0.496
Adj. R-sq.	0.236	0.457

* p<.0.05

At best, the results of the regressions in Table n° 5.13 above serve to support the speculation that, instead of population growth adversely affecting tenure status and, ultimately, agricultural productivity (as theory proposes), it is the level of productivity and land tenure conditions in an area that affects population growth. Provinces where the yield of rice is high and opportunities for owning land are also high will attract more people and this may help maintain high levels of growth. Conversely, poor yield and insecure land tenure conditions will be reflected in lower population growth rates. It is suggested that migration is an important and very dynamic component of this population growth scenario. As demonstrated above, the level of urbanization has a positive influence on growth. This implies

that substantial in-migration, contributing to higher growth, is occurring in more urbanized areas.

5.10 - Summary

The data from the Census of Agriculture demonstrates that, between 1960 and 1991 the number of farms in the country has more than doubled while the total farm area, increased by only 28 percent. Consequently, average farm size has decreased over time. There are indications of rapid fragmentation of agricultural land in the country, even as the majority of farmers own, in full or part, the land that they are farming. There has also been more 'intensive' and 'extensive' use of land for agricultural purposes. While a need exists for new land to cultivate, the land frontier has effectively closed with all subsequent lands opened for agriculture being largely located in conservation and watershed protection areas. Thus, any new land formally approved for cultivation is likely to come through the reclassification of public, protected lands. The strategies developed by Filipinos to cope with the collision of rapid population growth, lack of opportunities to open up new farms, and stagnant land reform are complex and statistical data presented above raises questions rather than providing clear answers. These questions are further explored using case studies of dominant agro-ecosystems in the next section of this book.

Chapter 6: Case Study Overview

6.1 - Introduction

Few studies in the Philippines have explored the nexus between population, landuse and food security. Even more distinctive is the approach taken in this study that explores the relationships at various scales: macro, meso and micro. Each variable at any scale presents its own complex set of challenges. The first section of this book considered the integration of the three variables at the macro level. Important relationships were found. Confirmation of these trends at the meso and micro level not only affirms knowledge gained at the macro level but also provides insights into the intersection of population, land tenure and food security at a local, process scale where intervention strategies should emerge. This will reflect the nature of Philippines socio-political development with its emphasis on the local (Larkin 1967; McCoy and de Jesus 1982). To effectively explore the intersection of the primary variables at different scales the research team approached the problems using different methods. The transdisciplinary team discussed and refined these methods to reach the goals as defined by the Charter. The methods chosen mirrored each discipline's core set of research approaches but these were tempered and adjusted through consultation. For example, ethnographic, in-depth case studies are a common way of investigating landuse and tenure patterns in the Philippines, while demographers have preferred to analyze nationally representative data derived from either the census or surveys. This part of the study utilized both approaches. As we relied on both secondary data and sample surveys the number of households interviewed ranged from 50 per barangay in Leyte to well over 100 in Cebu, depending on the literature drawn upon. In this section we provide a context for the case studies that follow through a description of the ethnicity of the cultures and profiles of the barangay studied.

6.2 - Ethnicity and social differentiation in the studied areas

The population of all the studied sites is of the lowland Christian type as defined by the currently used lexicon for the Philippines. These peoples are characterized by their relatively long

exposure to Christian religion, and the State's educational system. They have also been integrated into the Philippine economy since the early twentieth century. The only difference between the lowland Christian groups is language and dialects. In these case studies all the groups belong to the Visayan language group, the dominant language group in the country (Llamzon 1978).

Social differentiation is a very local concept in the Philippines (Ledesma 1982; Doronilla 1986; Kerkvliet 1990; Hutchinson 1993). With the different languages and dialects there are different terms used for what may be the same classification. For example, the Visayan region's cultures were noted at first European contact for their 'classness' and many of the references in the earliest literature were to this classness. Three main groups were identified as the *oripun*, *timawa* and *datu* (Scott 1980, 1984, 1991). The *oripun* could be held in legal bondage and could be bought and sold. In contrast, the *timawa* accompanied the *Datu* on forays into rival territory to gain goods and slaves, and were relieved from paying tribute. The *datu* was at the apex of the social hierarchy. He or she (as there is evidence of female political leaders) controlled both land and the people responsible for cultivating and processing its production. A wide array of Visayan terms can be found to describe the intimate relationships between the *datu* and the two groups of people 'below' them. These terms would today be equivalent to terms referring to positions of status. Terms such as *hayohay*, *horohan*, *mangayaw* and *magahat* referred to persons of different 'slave' status.

Both a class and a status position were inherited from one's parents or acquired by "debt, criminal wrong-doing, or victimization by the more powerful" (Scott 1991).

A further example of the outward expression of social differentiation among the inhabitants of the Visayas was tattooing. This ritual was highly developed and its personal extent was a reflection of the status to which an individual had risen in society. So widely was it practiced that the Spanish referred to the Visayan culture as *Pintados* or the painted people. Exploits in raiding parties and hunting prowess were two common forms of status raising.

Spanish accounts of classness in the Visayas included conspicuous references to chiefs and their influence, as when “the conversion of a certain old chief, on whom they all look as a father, made a beginning for the conversion of the rest” (Vaez 1601). A very important Spanish account summarized the standard by which the power of the Visayas chiefs could still be gauged in the late sixteenth century. In describing the burial of one of the island’s chiefs, the Spanish described the chief’s boat-like coffin that was accompanied by 70 sacrificed slaves, their arms, ammunition and food at the ready (Colin 1663).

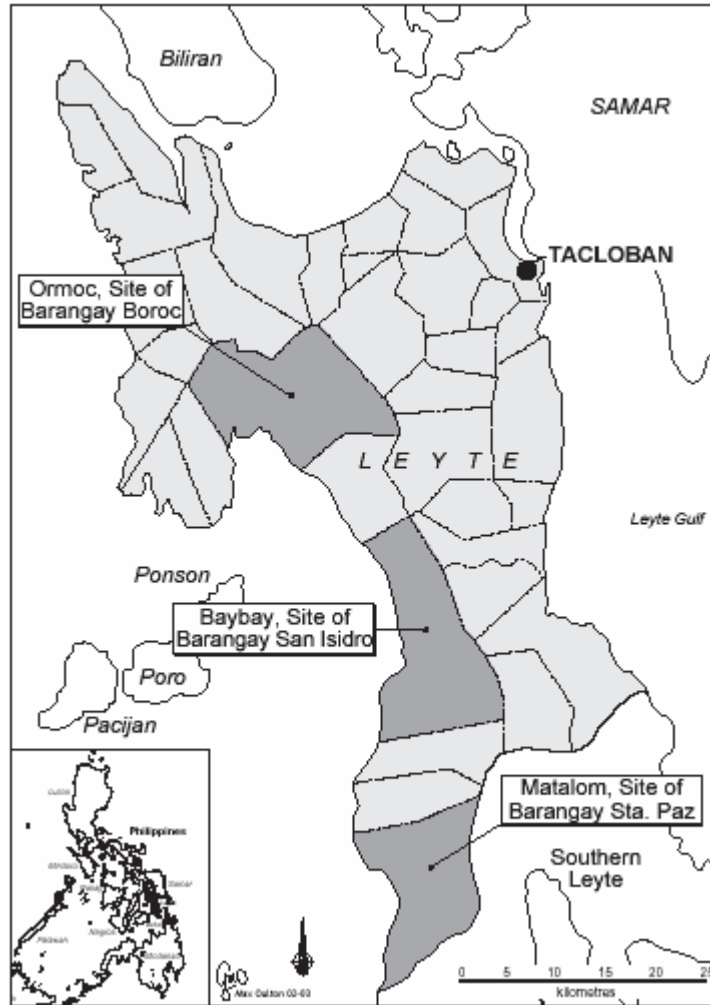
Today, in some areas of the Visayas members of this land-owning class are still termed *datu*. They not only own many lands but also have numerous people to cultivate them. Just below the *datu*, but also of the land-owning class, are the *arangan*, *naahan*, and *hayohaya*. They own lesser areas of land but were considered by others in the village to still have comfortable lives. The variation in terms for those below the *datu* referred to slight differences in their status within the community. A wide array of terms applies to those at the lower end of the social hierarchy. Of interest is the larger numbers of social classes defined today than in the early Spanish period.

6.3 - The case studies

Studies are more numerous in particular geographic locations, especially in the vicinity of areas of higher learning. Two such areas are the municipality of Matalom which has been the site of numerous studies carried out by staff and students affiliated with LSU in Baybay, Leyte. The second area is the peri-urban and upland environment in the vicinity of Cebu City situated on the eastern flanks of the central Philippine island of Cebu.

After considerable deliberation the demography and agricultural teams suggested that four study areas representing seven barangay be considered for detailed study. Three are located on the island of Leyte and the fourth on the island of Cebu (Figures n° 6.1 and n° 6.2).

Figure n° 6.1 – Locations of Leyte-based case studies sites



6.3.1 - Barangay Sta. Paz, Matalom, Leyte

Sta. Paz is in the upland zone of the municipality of Matalom in South Central Leyte. The wider case study site is the municipality of Matalom located about 60 kilometers from LSU and approximate 200 kilometers from the capital city of Tacloban. The municipality has a total land area of 12,000 hectares and is composed of 30 villages.

The uplands of Matalom can be classified as ‘acidic uplands’ at lower elevations and ‘calcareous uplands’ at elevations above 300 meters. About 73 percent of the total land area of Matalom belongs to the acidic upland ecosystem. The terrain of Matalom ranges from rolling to hilly and more than 50 percent of the area has a slope of 15 percent and above. Villages in upper Matalom are inaccessible by most vehicles during rainy months. In this zone there is a mixture of cropping systems, including but not exclusively rice, corn, root crops, bananas and coconuts. Upland rice is planted on strongly acidic soils, while corn is the dominant crop on calcareous soils. A single cereal crop followed by sweet potato is the common cropping system. Farmers cultivate between one and three parcels of land with a total area of commonly less than one hectare. More than half of farmers are share-tenants.

The total population of Matalom is about 30,000. The principal means of livelihood is farming and is largely subsistence. The area is generally of sloping land with poor agricultural potential. In-migration of people from the more densely populated coastal areas further increases population pressure in the uplands. Population pressures are high and include a population with high propensity towards mobility. Land tenure status may in some cases be less secure than in other landuse zones. The barangay of Sta. Paz, is an ARC (Agrarian Reform Community) that fulfills the needs of the tenure aspect of this study. In the Philippines, an increasing number of citizens are dependent on such upland environments for their subsistence. The continued occupation, and in some cases expansion, of such areas under sedentary cultivation poses a serious risk to the overall sustainability of agricultural and social systems.

6.3.2.- San Isidro, Baybay, Leyte

San Isidro is located in the municipality of Baybay, Leyte and is primarily a lowland rice growing area. The site has been under periodic study by staff and students at LSU for more than 20 years. The area represents a lowland irrigated farming system and is composed of three contiguous villages situated in Baybay, Leyte in East-Central Philippines. This area is located at the foot of a mountain range that divides Leyte. The mountain areas are still largely forested and water is generally abundant especially for

irrigation. San Isidro, one of the three villages, was selected as the study village and is closest to the town, roughly three kilometers away. It is connected to the highway by a dirt road that is passable by any vehicle in any type of weather. Tricycles for public transport serve the village. It has a few other services such as an elementary school, and receives periodic visits from health personnel and the agriculture extension service.

The topography of the village is one hundred percent flat. Several small creeks crisscross the area and provide irrigation water. Irrigation is generally by small gravity systems maintained by the group of irrigators served by the system. Some of the village land is planted to other crops, mainly coconuts, although the biggest area is planted to rice.

The population is composed mainly of farmers who are tenants, lessees or owner-operators cultivating plots of less than a hectare in size. Rice is planted continuously, usually three times a year. The farmers in the area follow modern production technologies but limited capital constrains their use of inputs. The local agriculture extension service provides technical advice and occasionally, input assistance such as seeds and fertilizers through credit provided either by the national or local government. Production is generally higher than other areas mainly due to adequate irrigation and modern practices. Family and hired persons provide labor. Hiring is generally done during land preparation. Most land preparation is done using water buffalo or small tractors. Hiring of water buffalo is on a daily basis while that of the tractor is by the hour. Transplanting is also done either by hired help on a *pakyao* (by task) basis or laborers are paid by the hour. The other operation, which is done by hired help, is harvesting. Harvesting crews also provide threshing and winnowing service as a package. They get a fixed percentage of the crop, usually one sixth of the gross.

For the other operations, jobs are done by subtenants under various subtenancy arrangements locally termed '*ambo*'. The subtenant may perform two or more operations such as transplanting, weeding and water management. They get exclusive rights to harvest the area. The subtenant saves the operator some of

the labor costs but the actual value of the exchange may not be the major consideration under this arrangement. Rather, it is the maintenance of relations among friends and relatives. Close friends and relatives generally enter into this type of arrangement because there is also the element of trust by both parties that each will provide the services and rewards expected. The arrangement though is very informal and as such cannot be invoked as a basis for a legal claim for tenancy, which is protected by agrarian reform laws. Many tenants and lessees are themselves entering into this type of arrangement that is why this is considered a form of sub-tenancy.

The economic picture of the area is always changing but the sources of these changes still have to be ascertained. Early studies show that many farmers' economic status has deteriorated. The economics of rice production especially in small landholdings are not encouraging. Small landholdings cannot provide the family with sufficient income to meet basic needs.

6.3.3 - Barangay Boroc, Ormoc, Leyte

Boroc is located in the northern half of Leyte and is a former sugar plantation or 'hacienda' communities in Ormoc, Leyte. Barangay Boroc is located about 10 kilometers from Ormoc City. The lands in this area are being distributed to tenants as part of the CARP initiated by the Philippine government in 1988.

The dominant crop is sugarcane but some farmers now cultivate coconut, corn, banana, rootcrops and vegetables. Boroc is a typical plantation-type community with a population of about 2000 people. The total land area is 1,211 hectares, 334 hectares of which are distributed to tenant farmers under the CARP, and benefiting about 300 farmers as Agrarian Reform Beneficiaries (ARBs). Farmers are organized into cooperatives, the Boroc/Ipil Agrarian Reform Beneficiaries Primary Multi-purpose Cooperative and the Boroc Agricultural Multi-Purpose Cooperative.

Most farmers are dependent on income from selling labor and sugarcane and it is noted that only a few farmers have now diversified their farming and have started adopting Low External Input Sustainable Agriculture technologies.

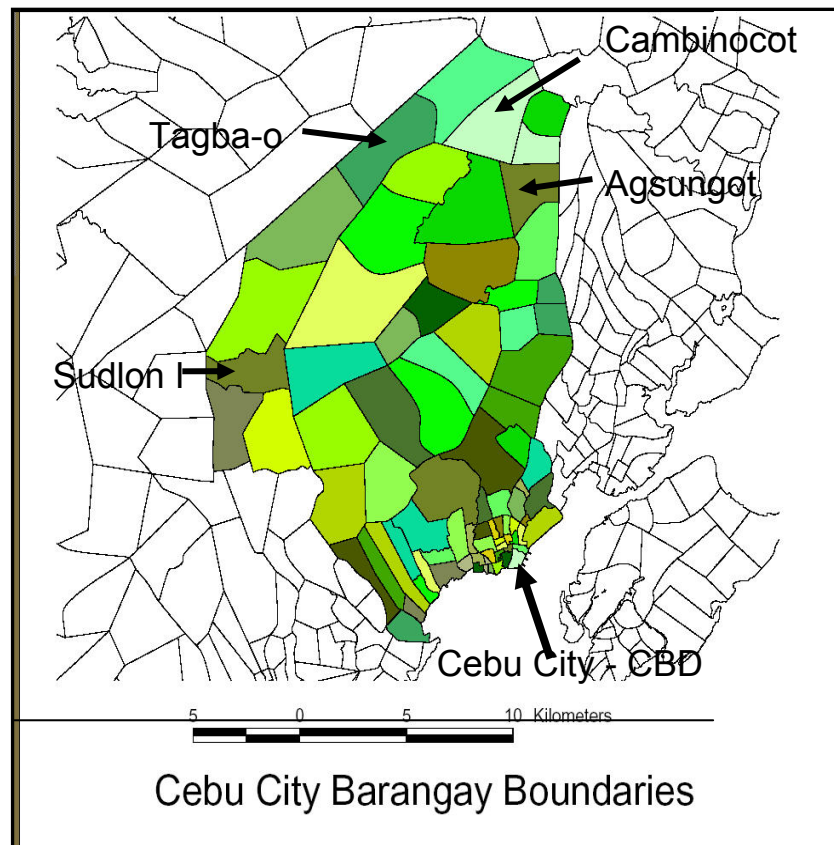
The Rural Development Institute (RDI) is an NGO working on Land Tenure Improvement (LTI) by facilitating the speedy acquisition and distribution of lands covered by CARP and in assisting farmer beneficiaries in solving cases that involve asset reform and other agrarian-related disputes. It also assists the farmers to increase productivity through its Productivity Systems Enhancement and Development Program (PSED) through introduction of appropriate technologies. It is interesting to study the changes in this type of community—formerly dominated by land landlords, as a result of the CARP-RDI interventions.

6.3.4.- Barangay Agsungot, Cambinocot, Sudlon 1 and Tagba-o, Cebu City, Cebu

The four barangay chosen for detailed study are situated in the peri-urban environment of Cebu City situated on the central portion of the island province of Cebu (Figure n° 6.2). The peri-urban environment consists of mountainous terrain and serves as the boundary between the Cebu metropolitan area in the east coast, and the western coastal municipalities of the province.³⁷ Metro Cebu is the shipping, transportation, manufacturing and service hub for the central and southern Philippines: it is second only to Metro Manila. As noted earlier the province of Cebu has the largest population in the country despite being, until recently, a net out-migration province.

³⁷ Cebu island is a narrow strip of land approximately 215 kilometers long and 35 kilometers at its widest portion. Metro Cebu is located in the central-eastern coastline of the province and consists of four cities (Cebu City, Mandaue City and Lapulapu City and Talisay City) and six municipalities. Of the four cities, Cebu City has the most number of barangay situated in the upland, peri-urban periphery.

Figure n° 6.2 – Location of the studied peri-urban barangay



What makes peri-urban Cebu different from the other case study areas is not only its propinquity to the metropolitan area but also because it encompasses four natural conservation areas: two watersheds and two national parks. Any agricultural activity in the area is necessarily affected by these two attributes.

In the upland peri-urban environment of Cebu City population growth rates in the last decade are observed to be among the highest in the country (greater than 4.0 percent). This is a consequence of both high fertility in the uplands and population mobility that serves to reduce population pressure in the lower Metro Cebu area. Agriculture is an important means of livelihood in this peri-urban environment. Almost all land in the area, including the protected areas, have been converted to agriculture. At least two-thirds of the households residing in the area derive income from agriculture. Corn is the predominant crop, interspersed with root crops, vegetables and flowers, a response to market demands in the cities below. Agricultural productivity, however, appears to be on the decline mainly because of land degradation. More importantly, farmers are caught between two opposing forces: 1] environmental protection measures for the watersheds and national parks; and, 2] the urban sprawl primarily characterized by subdivisions and housing projects providing residence to the more affluent inhabitants of the city.

Four barangay from the 22 which constitute peri-urban Cebu City have been chosen for detailed study. These four: Agsungot, Cambinocot, Sudlon 1 and Tagba-o, were chosen for their strategic value and location in the peri-urban environment and land tenure situation with some being State-owned lands and others in private ownership. The access of these four barangay to the central business district (CBD) via common routes is variable: Agsungot is 26 kilometers from the CBD with a traveling time of approximately one hour, similarly, Cambinocot is 30 kilometers and one and a half hours, Tagba-o is 25 kilometers and one hour and, Sudlon 1 is 35 kilometers and two hours from the CBD.

This second section of the book examines the case studies in more depth. The same variables addressed in the first section are again examined with a nuanced approach which brings to life the individual circumstances of village families and the adaptation strategies that are culturally embedded.

Chapter 7: Upland Case Study

7.1 -Village profile

Sta. Paz is one of the 30 barangay in the municipality of Matalom, Leyte. Matalom is located 159 kilometers south of Tacloban City, the provincial capital and 90 kilometers from Ormoc City, another growth center of the province. It is linked to these cities by concrete provincial roads and the *Maharlika* highway. Matalom has a total land area of more than 12,000 hectares and a population of about 30,200 people according to the 2000 Census. The adjacent municipality of Bato in the north and the City of Maasin in the south provide Matalom with cargo and passenger sea vessels for linking with the neighboring islands of Cebu and Bohol.

Barangay Sta. Paz is located about five kilometers northeast of the town center (poblacion) of Matalom. Sta. Paz has a total land area of 1,122 hectares and consists of six *sitios* (zones) including the barangay proper. The major means of transportation within the barangay is the motorcycle.³⁸ At the time of the study, the bridge linking the barangay to the town proper was under repair so four wheeled vehicles could not reach the barangay.

The barangay's landscape consists mostly of rolling hills and mountains with just a small portion of flat land. It has an elevation of between 50 and 230 meters above sea level. It has two types of soil, namely, the Maasin Clay and the Calcareous Soil. The Maasin Clay is found in the lower part of the village and has a pH value of 4.5-5.2. The calcareous soil common in the upper part of the village has a pH of 8-9. It has been observed that the hilly areas are mostly infertile due to soil erosion. The Tubig-Daku River at the boundary of adjacent barangay, Templanza and Lowan, provides a potential

³⁸ This motorcycle has no side-car or trailer (known as the 'tricycle' in more urbanized parts of the Philippines). It generally is a motorcycle-for-hire, also known as a *habal-habal*. A reinforced suspension and additional footrests are installed to facilitate the carrying of between four and six passengers (and possibly more if small children are included).

source of irrigation water. The main source of potable water for the barangay is ground water tapped by deep wells.

The climate of Sta. Paz is characterized by rainfall that is unevenly distributed through the year. Typically a dry season occurs from late February to early May while the wet season is from September to late January. Based on 1997 records, the average maximum temperature in Sta. Paz is 33.25 degrees Celsius while the average minimum temperature is 21.65 degrees Celsius.

Sta. Paz has a four kilometer all-weather and gravel barangay road that connects it to the highway. It is further connected to the town by about a kilometer of concrete road. The entire road network is maintained by the Local Government Unit (LGU) of Matalom and the barangay government. Sta. Paz gets electrical power from the Leyte Electric Cooperative. To date, however, the electrical cooperative serves only the barangay center and not all of its sitios. For potable water, the barangay has eight deep wells and a piped potable water system.

At the time of the 2000 census there were 2,069 people and 366 households in Sta. Paz. A decade earlier there were 2,076 people and 364 households. The average household size was around 6 persons. According to the survey in 2001 conducted for this study, there were more women than men in Sta. Paz (98 men per 100 women). The shortage of men was more pronounced for the younger working ages 15-39 years old (82 men per 100 women). The median age of the population was 20. With respect to age composition, about one third (34.6 percent) of the population was below age 15, more than half (56.5 percent) were in the working ages 15-64, and less than a tenth (8.9 percent) were 65 years old and older. The age dependency burden was 77, that is, 61 children and 16 old-age dependents per 100 persons of working age. The child-woman ratio stood at 0.50 meaning there were 50 children under five years old for every 100 women of reproductive age.

For a national comparison of age-dependency burden from the 1995 census, the Philippines was 72.2 (66 young dependents and 6 old-age dependents). For Leyte province, it is estimated to be 83.4.

Hence the Sta. Paz figure is slightly higher than the national average in 1995 and lower than the provincial figure.

Typically, the household head in Sta. Paz and his/her spouse was around 49 years old. About half of their children were aged 20 and below, and again another half of these were between 0 and 9 years, inclusive. The majority of household heads and their spouses have had at least five years of elementary education, although more wives than husbands have had secondary education. Their children generally had completed elementary education (up to Grade 6).

The survey also revealed that one out of every four family members had migrated out of Sta. Paz. The median age of these out-migrants was 31 years. Most out-migrants (58.2 percent) were males which explains the low sex ratio of the barangay. On average, migrants had completed seven years of formal education (up to first year high school). Most migrants left the barangay to work in the cities as factory workers, house helpers, drivers and construction workers. Migrants prefer to work in Cebu and Manila.

Nearly all household heads in Sta. Paz are males; only six percent of them are females. Eight out of every ten heads of households are working in agriculture, the lowest participation of household heads in agriculture among the four case study areas. Some 21.3 percent of household heads do not work in agriculture. Female heads of households, in particular, are less likely than male heads to be in agriculture. Moreover, if the household head is not in agriculture, neither is any other person in the household.³⁹ This relatively low rate of agricultural participation compared with other study areas is indicative of the low returns to agriculture in this area and does not reflect on the availability, locally, of alternative laboring opportunities; people are either unemployed/underemployed or rely heavily on remittances.

As observed above, one-third of the population is under 15 years of age and the youth dependency ratio is 61. It is not surprising

³⁹ This description of the nature of agricultural participation of the household head and, subsequently, by other members of the household is patterned after an index devised by Collomb (2000) and described in Chapter 2.

therefore that a fairly significant number of farming households in Sta. Paz are in the early or middle stages of the family life cycle: both husband and wife are working in agriculture, have young children (under 15 years old) but no elderly persons (65 and older) living in the household (this is the case for 31.9 percent of households), or the farm couple may have neither children nor old people living with them in the household (17.0 percent). It is possible that in the latter case teenage children may have left the village to study or to work elsewhere.

7.2 - Land ownership

Most lands are either owned by the father or are conjugal property of the couple. Generally, only a few women own land in the community. The area of the land owned by women is at most 1.5 hectares. Almost all of the respondents said that buying land 10 years ago was quite easy compared with now. The usual price of upland land 10 years ago was only about P29,000 a hectare. Some respondents, however, said that it was also difficult to find such an amount a decade ago. The price of an upland farm is now about P60,000 per hectare. To put this and other monetary figures in context, 10 years ago the peso/dollar rate was approximately US\$1 to P27, versus the current P52 to the dollar. Inflation has ranged from slightly over 10 percent per year to as low as two percent per year since the mid-1990s with a mean of close to six percent.

7.3 - Income generating

The average total household income from crop production was P4,723 per annum while income from livestock production was P5,976. The total income from other sources was quite high at P31,513. Other income sources included small businesses, remittances from children working in other places, regular wages or salaries, and other informal and temporary laboring opportunities. The average total annual income was P33,193.

7.4 - Education and Institutions

The barangay has a public elementary school providing complete elementary education to about 300 pupils (grades one through six).⁴⁰ The school has seven classrooms and eight teachers. The nearest secondary schools are the Matalom National Vocational School, Bato School of Fisheries and the Saint Joseph Academy (in town centre of Matalom) which are on the average located eight kilometers from the barangay. Post secondary and tertiary education may be obtained in schools and colleges outside of Matalom, for example at the Sogod School of Arts and Trades in Sogod, Southern Leyte; Saint Joseph College in Maasin, Southern Leyte; Bato Maritime Institute in Bato, Leyte; and, the prestigious LSU in Baybay, Leyte.

Sta. Paz has one farmer organization—the Sta. Paz Agrarian Cooperative (SPAC). Aside from SPAC, it has an organization for the youth called Sangguniang Kabataan, Sangguniang Barangay, Parents Teachers Association and other Organizations.

As a barangay of Matalom, Sta. Paz is included in a major program of the town dubbed ‘Matalom 2000’. Launched in February 1995, the program carries five flagship programs set to enhance the socio-economic development of Matalom and its barangay. The sub-programs are food production, road construction and maintenance, agro-forestry and reforestation, industry, income generation and irrigation.

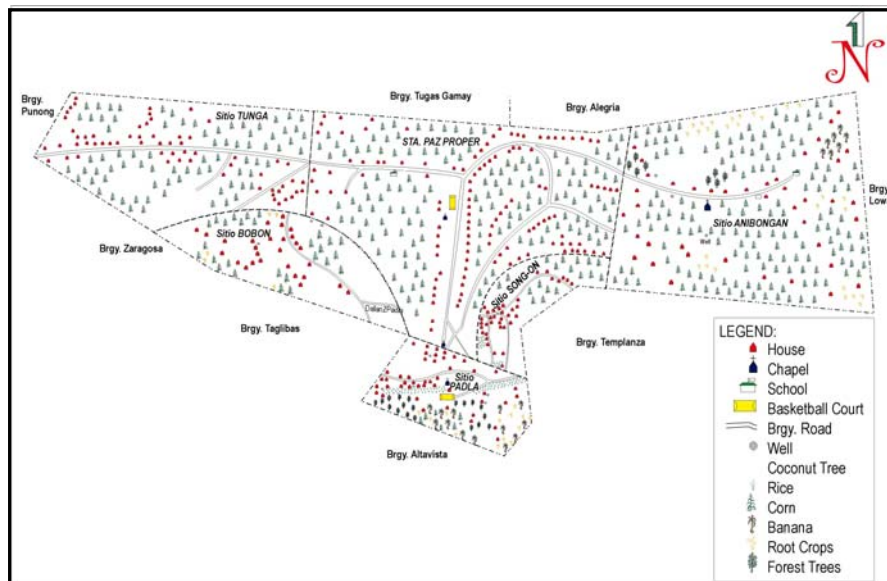
7.5 - Farming systems and landuse

The farming system is mixed cropping. The four major crops are: corn, coconut, upland rice and lowland rice. Corn is planted twice a year in the months of February—March and May—June. Upland rice is planted once a year in the months of May and June.

⁴⁰ In the Philippines a ‘Primary’ school provides education from grades one through four, an ‘Elementary’ school provides education from grades one through six (the legal minimum for the nation’s children). A ‘High School’ serves grades seven through ten. A High School diploma is being increasingly recognized as the minimum entry requirement for urban-based employment and certainly for international opportunities. Colleges and Universities are also widespread.

Seventy-six percent of Sta. Paz is planted with corn, coconut and upland rice with a small portion planted to irrigated or rainfed lowland rice, abaca, bananas and coffee (Figure n° 7.1). Bananas are planted under coconuts or along boundaries while rootcrops such as sweet potatoes are planted after corn as a rotation crop. In Sta. Paz, some farmers cultivated more than one parcel of land. A farmer's first parcel is basically planted to corn (according to 45.83 percent of the respondents). The other parcels are planted to upland rice (55.88 percent) coconut (26.47 percent) and corn (17.65 percent). Most corn areas are also planted to other crops like sweet potato, cassava, peanuts, and other minor crops with bananas and/or fruit trees planted around the perimeter.

Figure n° 7.1 - Landuse of Barangay Sta. Paz, Matalom, Leyte



7.6 - Production

The production level of the basic crops cultivated in Sta. Paz is low. According to the farmers, poor soil condition is the major culprit for the low farm productivity, aggravated by the traditional method of farming and the lack of genuine support for agricultural production from government agencies.

The average corn production is 9.0 cavans⁴¹/hectare (0.45 tonnes/hectare) (Table n° 7.1). Some reasons for low corn productivity are infestation of corn borers and infertile soil. Only very few farmers apply fertilizer to their corn. The average upland rice production was only 24.50 cavans/hectare (0.9 tonnes/hectare.) For copra, the production is only about 300 kilograms (0.30 tonnes) per hectare per harvest. Normally, coconut is harvested three times a year.

Table n° 7.1 – Upland crop production, Sta. Paz, Matalom, Leyte, 2002

Corn production In cavans per hectare	Parcel 1		Parcel 2	
	No.	%	No.	%
1 – 5	4	57.1	6	50.0
6 – 10	1	14.3	3	25.0
11 – 15	2	28.6	3	25.0
Mean	6.71		7.67	
Range	3-15		4-15	

⁴¹ A cavan is equivalent to approximately 75 liters.

Rice production in cavans/ha				
1 – 20	12	60.0		
21 – 40	4	20.0		
41 – 60	3	15.0		
61 – 80	1	5.0		
Mean	24.5			
Range	3-80			
Copra production In kilograms per hectare				
1 – 250	5	62.5		
251 – 500	1	12.5	6	
501 – 750	1	12.5	1	
751 and above	1	12.5	2	
Mean		326.88		
Range		15 – 900		

7.7 - Number of parcels and size

In Sta. Paz, 76.9 percent of the farmers are cultivating one or two farm parcels and about one-fifth (23.1 percent) have three or four farm parcels (Table n° 7.2). A majority of the respondents (59.0 percent) have a farm area below 0.5 hectares. The mean farm size for the barangay was a mere 6800 square meters. Given the poor soil conditions and lack of technical support, the pressures of production, degradation of the fragile resource base and, subsequent out-migration of the male population is to be expected.

Table n° 7.2 – Number of parcels and area of farms, Sta. Paz, Matalom, Leyte 2002

No. of Farm Parcels	Respondents n = 50	Percent
1 – 2	30	76.9
3 – 4	9	23.1
Mean 1.90		
Range 1 – 4		
Area of farms (in hectare)		
Lowest to 0.5	23	59.0
0.6 – 1.0	13	33.3
1.1 – 1.5	1	2.6
1.6 – 2.0	1	2.6
3.1 – 3.5	1	2.6
Mean 0.68533		
Range 0.008 – 3.20		

7.8 - Tenure

In the early 1980s, prior to the implementation of the CARP, a large portion of barangay Sta. Paz was classified as Government Owned Lands (GOL) but had actually been cultivated by the farmers for sometime. The actual landuse was never reported to the DENR Central Office and to its Land Classification (LC) Division. The land's classification as GOL, based on the DENR records, was used as a basis for the DENR to approve the farm lease application on the said GOL by a businessman from Ormoc City who converted the land into a cattle ranch. The businessman fortified the area with heavy barbwire where he kept cattle without giving farmers enough time to harvest their crops which were consequently destroyed by the animals.

Worse, the farmers were denied access to cultivate the land, which was the only source of land to gain a livelihood. As a consequence, social unrest occurred in the area. The farmers destroyed a large part of the fortification and killed some of the cattle. Trouble escalated when the businessman hired armed personnel to secure the land. However, the tension subsided with the intercession of the government. The conflict was resolved with assistance of the Federation of Free Farmers (FFF). The lease agreement was cancelled and the land was converted into an alienable and disposable area and later subdivided and surveyed for the farmers.

As mentioned, some farmers in the case study sites cultivated more than one parcel of land. In the first parcel, more than half (57.9 percent) of the farmers were share tenants and about one-third (31.6 percent) were owner-operators (Table n° 7.3). There were only a few landlords and amortizing owners (meaning those paying back a loan for land but cultivating the land from an owner-like perspective). In another parcel, less than half (44 percent) were owner-operators while about half (48 percent) were share tenants. Almost the same numbers were either owner non-cultivators or amortizing owners. In the case of three parcel farms, five farmers (56 percent) were owner-operators and four were share tenants (44 percent). Only two farmers were cultivating four parcels and both were share tenants.

Table n° 7.3 – Land tenure, Sta. Paz. Matalom, Leyte, 2002

CHARACTERISTICS Tenure	Parcel 1		Parcel 2		Parcel 3		Parcel 4	
	No	%	No	%	No	%	No	%
1-owner operator	12	32.6	11	44.0	5	55.6		
2-owner non-cultivator	3	7.9	1	4.0				
3-amortizing owner	1	2.6	1	4.0				
4-share tenant	22	57.9	12	48.0	4	44.4	2	100.0
5-leaseholder								
6-other tenurial arrangements								

7.9 - Additional information

More than half of the respondents planted from one to three rice varieties in parcel one and two ten years ago but now they only use one to two varieties. This is because of the availability of varieties. Most varieties available today are so called 'modern' varieties derived from the IRRI rice breeding program and other outside sources. For corn varieties, some respondents reduced the number of corn varieties they used (from two to one). According to them, they used the traditional variety again because they do not like the newly introduced one. However, there were respondents that used two corn varieties now because there is an available variety provided by the government technician. But some still only use the traditional variety.

The average number of trees grown in parcel one ten years ago was 62.65 and ranged from five to 200 trees. At present, the average number was 79.57 trees. This change in the number of trees is because of their motivation to increase tree production. In parcel two, the average number of trees decreased from 98.50 ten years ago

down to 73.88 at present. The reason for this is that some of the trees were cut and some were damaged by typhoons.

Out of 13 respondents growing rice, 38.5 percent have 1-25 kg/hectare of traditional local varieties of rice seed that were grown 10 or more years ago while at present more than half of the respondents have 26-50 kg/hectare of modern rice seeds derived from outside sources. The reason for the change in quantity is the availability of the varieties given, often free, by the technician.

Out of the 50 respondents, only 10 (20 percent) were members of a farmer's organization and have attended agricultural seminars. Most of the respondents were members for more than a year. The organization's main purpose was lending. The most common seminars they attended were on farming and raising poultry and livestock. The Department of Agriculture (hereafter DA), LSU, and Municipal Agricultural Office (hereafter MAO) conducted the seminars. The main lesson they learned concerned agricultural techniques. A majority of the respondents said that one or two agricultural technician always visited/served their barangay. These technicians came from CASO, DAR, LSU and other agencies. They gave lectures about contour farming and gave away farm inputs like fertilizer and planting materials. Most of them obtained credit from farming wherein their main sources were Gintong Ani⁴², and DA. More than one half of the respondents have borrowed money (P1000.00 or above) at 5 percent interest.

About 50 percent of the respondents received agricultural information more than five times from a DA technician, LSU and PCA. This information was transmitted through broadcasts (radio) and the print media. According to them the most important information they received from the information source was about proper planting of corn, rice, trees, and other crops.

⁴² The government's Gintong Ani program is aimed at increasing agricultural production in the country's poorest regions.

7.10 - Interrelationships

Facts and information used in the succeeding analysis were generated from the focus group discussion (hereafter FGD) conducted in Sta. Paz on April 1, 2002. The FGD was attended by 15 barangay people representing the farmers group (4), women (4), barangay officials (3), barangay health worker (1), barangay nursery teacher (1), and youth (2).

The case study site is one of the thousands of upland barangay in the Philippines. The agricultural production is largely through family labor and the production level is so low because of the following circumstances:

- The landholdings of the farmers in Sta. Paz are small (mean of 0.68 hectares). One half a hectare of corn land will only provide the family of 6-7 people with a few sacks of corn grits after three or four months. Also, there are cases where the whole farm is not being cropped because of some marginal portions of land which can not be cultivated economically. Lastly, farmers have to fallow (rest) the land in some periods because the soil can not sustain continual production.
- The major crop is corn. Other crops are upland rice, banana, rootcrops and some legumes. Technologies used in producing these crops are traditional (seeds, fertilization, planting distance, cultivation methods) resulting in low productivity.
- The soils (both the acidic and calcareous) are infertile due to nearly continuous cultivation and are very sensitive to environmental hazards such as erosion and water stress. The hillsides are severely eroded and Matalom has suffered from the effects of long droughts and typhoons.
- There is a high incidence of tenancy at more than 60 percent. Tenants are usually discouraged from adopting long-term technological interventions.
- Poor road and inadequate market facilities act as a disincentive to farmers. Farmers on the hillsides have problems transporting their produce to the lowland.

- Until this time the government priority for development has been placed on lowland agriculture.
- Sta. Paz, like other upland areas received an inconsequential agricultural service from the government when compared with irrigated barangay. Furthermore the most available technologies are not appropriate for upland environments.

With all these problems in the uplands, it is logical for people—especially the young members of the community—to migrate and seek opportunities for survival in other places. In Sta. Paz more men migrated than women because the women are weaving '*sinamay*' (woven abaca fiber) as an alternative source of income. The older farmers are left in the village to cultivate the farm. These migrating members of the family in one way or the other are helping their families by remitting some portion of their income earned in the city. Moreover, their absence reduces the burden of the family to produce for their local sustenance and shelter. Some families in the study site are relying on remittances from their children for food, education of younger brothers or sisters, the purchase of farm inputs and sometimes house construction or repairs. The unmarried people who migrate will eventually get married and stay in the area where they are working. Only a very few decide to come back to the upland farms.

According to the farmers, the situation with the uplands becoming infertile will continue unless some drastic moves or interventions are put in place. However, even if production improves, the migration of young household members will still continue because upland farming can not support their needs.

7.11 - Summary

Sta. Paz, Matalom, exemplifies many of the problems faced by upland communities throughout the Philippines. The achievement of food security is hampered by the lack of tenure security, resource grabbing by more powerful people, accompanied by inaccessibility, poor soils, small farms and low productivity. These areas are in need of change perhaps more than any other system in the country. The lowland system that is described next does however exhibit

different coping mechanisms in response to some of the same problems of small farm size and population growth. These parallels in coping point to some unifying concepts about the relationships between population dynamics, land tenure and food security across the archipelago.

Chapter 8: Lowland Case Study

8.1 - Village profile

The village of San Isidro is dominated by its lowland, irrigated farming system. The village is located in Baybay, Leyte. This barangay is approximate three kilometers from the town proper. It is connected to the highway by a dirt road that is passable by any vehicle in any kind of weather. Motorized tricycles, however, are the public and most common means of local transportation.

The topography is flat with several creeks crossing the village providing convenient sources of irrigation water. The village has a few other services such as a public elementary school and a barangay health center. It gets periodic visits from the municipal health personnel and the agriculture extension service.

The population of San Isidro is well dispersed across the village, with houses mainly along the roadsides. The village has four sitios but residents are mostly concentrated in the barangay proper. There were 257 households and 1,311 persons residing in the village during the last census of 2000. In 1990 the count was 256 households and 1,356 people.

The total area of the barangay is 194.99 hectares, which in Leyte is relatively small for an agricultural village. This is mainly because San Isidro is a young barangay carved out from a larger one. Its closeness to Baybay town proper gives its residents the potential for occupational diversification but its irrigated rice lands have kept the bulk of its population, at least for those who choose to stay in the barangay, occupied with farming.

The ease with which village residents can travel to Baybay or Maasin, take an inter-island vessel to Cebu and other large cities in the country has been a facilitating factor for out-migration among the young in San Isidro. About 27 percent of family members in the village have moved out in recent years. Most of those who left were women (61.1 percent) and with more years of education than the men (9.5 compared to 8.5 years).

Partly because of the preponderance of female out-migration and the need for men to work in the rice fields, the sex ratio in San Isidro shows men outnumbering women by a considerable margin (121 men per 100 women). On account of this deficit of young women, fertility is lowest in San Isidro compared to the other case study areas. The child-woman ratio shows that there are only 20 children under five years old per 100 women of reproductive age. The age dependency ratio is 46 with 36 child dependents and 10 old age dependents for every 100 persons of productive ages. With relatively low fertility and heavy out-migration of young people, San Isidro has the oldest population of the four study areas; the median age of its population is 32 years.

As is typical in the rural Philippines, most heads of households in San Isidro are males (93.7 percent) and nearly all of them are working in agriculture (95.5 percent). Of the few women who headed households, they too were engaged in agriculture. The predominant pattern of agricultural participation in the village is exemplified by a household with two persons working on the farm, most likely the husband and wife or a father and a son, with or without young children (under 15 years of age) and no household member 65 years old and over.⁴³

In general, the household head and his/her spouse had completed elementary education and may have had a few years of secondary education. As in the case of Sta. Paz, the wives usually had more education than their husbands (one more year on average). In the Philippines, it is common for women to attain higher levels of education than men. Children had usually attained a higher level of education than their parents. While the average years of schooling for the father was 6.3 years and the mother's 7.2 years, that of the children was 8.7 years.

8.2 - Farming systems and landuse

Rice farming in San Isidro is relatively complex both in terms of technology and social arrangements. Being an irrigated

⁴³ In Collomb's index these are categories 39 and 41.

area, farmers in the village had been in the forefront of adoption of the latest rice production technologies although the financial resources of the farmers generally mediated their use. Closeness to the market has also provided an impetus to commercialize financing, marketing and labor arrangements. For example, harvesting, threshing and winnowing are usually done by thresher operators as a package. Transplanting is paid by the hour, an arrangement not commonly practiced elsewhere. Land preparation is done by light tractor operators who are also paid on an hourly basis. Even the drying services are provided by millers for a nominal fee as an inducement to customers. Commercial buyers generally do the drying so they buy the rice fresh at harvest. San Isidro has a number of local merchants living in the village.

Many rice farmers can not provide their own production capital thus they borrow from rice merchants and millers, at varying interest rates or with marketing deals. One arrangement, for example, is for the farmer to get an advance during land preparation with payment made with interest in kind (rice) during harvest. If the lender is not a merchant, the farmer could sell the rice to anybody. If the lender is a merchant then the latter demands exclusive right to buy the produce at the same price as other merchants or at a slightly lower price. Other merchants also own threshers so that they also provide the threshing service thus adding to their hold on the farmer. Generally, mechanized threshing had been adopted in the village for a decade or two. Merchants and lenders also provide certain concessions in order to get the farmers to sell their rice to them. There is stiff competition among rice merchants in the area. Interest rates from informal sources are generally high but a loan is easy to obtain, thus, many farmers choose informal sources. Self-financed farmers do not suffer from the onerous terms under these arrangements but for many who had to borrow, it has become a way of life. The local agriculture extension service provides technical advice and occasionally, input assistance such as seeds and fertilizers through credit provided either by the national or local governments. Input dealers based in town also provide technical advice, although normally the farmers in the area are technologically aware. Family and hired help generally provide labor for the maintenance operations. Hiring is typically done only for certain operations such as land preparation, transplanting and

harvesting/threshing. Drying and storage facilities become a problem during the wet season when harvesting occurs during inclement weather. Farm size has generally shrunk in terms of the general area devoted to crops owing to conversion to other uses such as residential and infrastructure sites. The area cultivated by each family can also shrink because of further subdivisions by heirs who have married and have decided to go into farming. Some parcels have also been sold to buyers who do not come from the area while others have been mortgaged.

8.3 - Income generating

The economic picture of the area has changed but the source of these changes result, in part, from non-farm, exogenous sources, one of which is remittances. It is not surprising though, if many have actually deteriorated in their economic status. The economics of rice production especially in small landholdings is not encouraging. Small landholdings cannot provide the family sufficient income to enable it to meet its basic needs.

Besides rice farming, 62.5 percent of the respondents indicated they were employed in a job in the community, such as carpentry. Other jobs available in the community include some government work, domestic help, and other service-type occupation such as driving.

For almost all (93.3 percent) families, only one full-time laborer was available to do farm activities. However, part-time labor of one to three other household members was available to 90.7 percent of them. Other households had more part-time labor available. The women generally helped in doing minor farm activities such as uprooting the seedlings, transplanting, hand weeding and fertilizing.

64.3 percent of the respondents claimed to have one to two family members working in the city while 35.7 percent had three to four members working in the city. These cities included Manila, Cebu, Davao and Tacloban. The presence of so many family members working outside the village could be in some way linked

with the high price of land currently experienced by villagers. This inflated land price could be afforded through remittances.

The types of job in the cities included construction/factory work, housemaid/boy, driver, carpenter, sales lady, waiter and security guard. It is clear that more job seekers (53 percent) found jobs as housemaids/boys in the city. Those who sought employment abroad usually worked as domestic helpers.

All respondents, 100 percent, disclosed that hiring farm help was much easier and cheaper 10 years ago. Based on the data, 52 percent of the respondents indicated that costs ranged from P100 to P250 per person with carabao⁴⁴ as the hiring rate. For those without carabao, the rate ranged from P40 - P100 per day as indicated by 60 percent of the respondents.

For manual labor such as hand weeding, all respondents found it easy (100 percent) to look for farm laborers to do the tasks. Generally, the hiring rate for manual laborers 10 years ago ranged from 40 to 80 pesos per day without meals. The latest hiring arrangement for manual labor such as hand weeding, rotary weeding is 12 pesos per hour. A number of landless farmers accepted a sub-tenancy locally termed as 'ambo' whereby they cultivated a parcel of land already tenanted by another person. A portion of the harvest was provided to the tenant who then provided some of that to the land owner as final payment for the use of the land.

In terms of income, 30 percent of the rice farmers realized an income within a range of P1,000 to P4,000 over a 12-month period with 13.3 percent of the farmers getting as high as P10,000 and above. The average income of all respondents is P5179/12 months.

Although income from copra varies from farm to farm, some (62.5 percent) respondents earned from P1,000 to P2,000 within a 12-month period. A further 25 percent had an income of between P6,001 and P8,000. The average income from copra for the 12-month period was P2,768. The combined average income from crop production was P5,781. However, 54.8 percent of the respondents

⁴⁴ Water buffalo are still commonly used for draft purposes in the Philippines.

reported an income of between P1,000 and P5,000 for the entire 12 month period.

Livestock raising, handicraft and business were sources of other income. Some respondents, 86.2 percent, had one to three head of swine. Very few, 6.9 percent, had four to six head. On average there were two swine per household. A few families had cattle, for these income ranged from P2,001 to P6,000 for the 12-month period. The average income from cattle was P5,700. Chickens, raised by all households also contributed some income. The average income from chicken was P546.67. As estimated, the total income from livestock as expressed by 57.7 percent of respondents ranged from P1,000 to P5,000. Thus the average family earned about P7,250 a year.

The average annual income of household members from other sources amounted to P19,064. However, the majority (62.8 percent) had an annual income ranging from P5,000 to P20,000 regardless of the sources. Although a few households (4.7 percent) had an annual income of P100,000 and above. However, based on the average, households had a total annual income of P35,819.

8.4 - Organizations and support services

All households interviewed indicated membership in an organization in the barangay with 50 percent of the respondents having been a member for one to 10 years.

More than 47 percent of the farmers were visited by technicians between 51 and 100 times the previous year. As recalled by the respondents, technicians had an average of 122 visits to the village each year. More respondents (88 percent) reported to have been given technical advice by an agricultural technician. Also, some housekeepers attended seminars in handicraft production conducted by the DA technicians and an extension unit of the LSU.

Farmers reported having received agricultural information such as improved methods of planting rice, pest control, new varieties of rice and sources of certified seeds. All other information about farming was obtained either through broadcast or printed media. Few farmers (4) obtained credit from formal sources. The

amount of credit ranged from P500 to P2,000 pesos per cropping season.

8.5 - Tenure, farming patterns and agricultural productivity

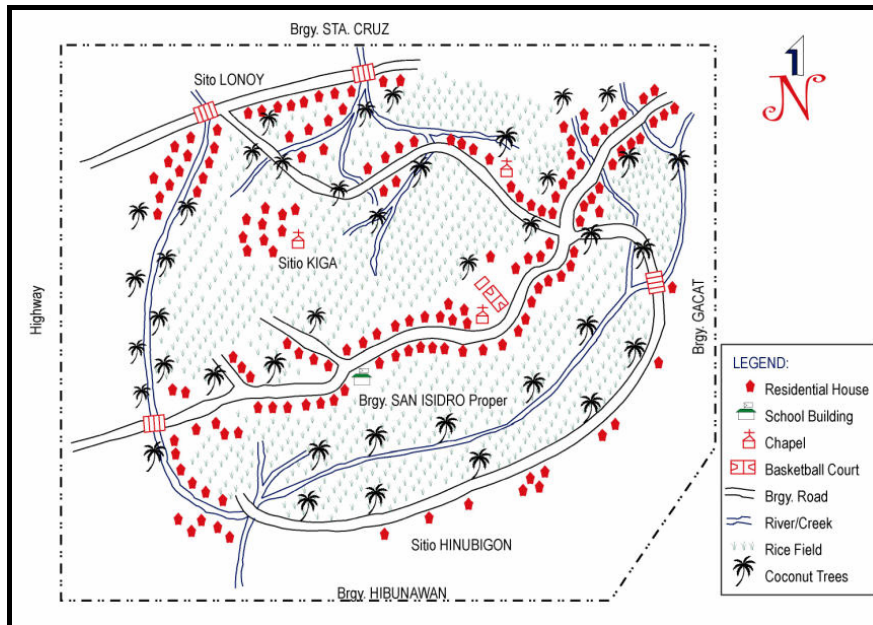
San Isidro is located at the foot of a mountain range that divides Leyte Island into east and west. The mountainous areas are still largely forested thus water is still generally abundant especially for irrigation. Irrigation is generally composed of small gravity systems maintained by the group of irrigators being served by the system. Some portions of the village were planted to other crops, mainly coconuts. The biggest portion though was planted to rice (Figure n° 8.1). Other crops such as coconuts and corn were planted along the roads and near settlement areas.

The main crops grown in parcels one, two and three, were lowland rice, corn and coconut, respectively. Parcel one was largely devoted to rice, whereas parcel two was planted either to rice, corn or coconut. The main crop grown in parcel three was coconut. A general landuse map of the village is shown in Figure n° 8.1. Ten years ago the majority of the farmers (91 percent) already planted between one and three modern varieties (MVs) of rice. Other farmers (8.9 percent) planted between four and six varieties 10 years ago.

Thirty four percent of the respondents had rice fields that yielded between 21 and 40 cavans⁴⁵ per harvest per season. A similar percentage of farmers harvested between 1 and 20 cavans per harvest. The rest (17 percent) of the respondents had a yield of between 41 and 60 cavans. The average yield was 37.68 cavans per harvest. This shows the relatively small sizes of their farms. Computed on a per hectare basis, however, the average rice yield was high—94.36 cavans. This translates to 4.2 tonnes per hectare which is very high compared to national yield levels. The numbers show the relatively high productivity of the area as earlier mentioned. Possible explanations could be the high rate of adoption of recommended technologies and the continuous availability of irrigation water.

⁴⁵ A cavan of rice (dry but not milled) weighs approximately 45 kilograms.

Figure n° 8.1 - Landuse of Barangay San Isidro, Baybay, Leyte



8.6 - Farm size and number of parcels

The data show that 76.6 percent of the households had one parcel of land to cultivate. Very few households (17 percent) had two parcels and fewer still (6.4 percent) owned three parcels. Eighty-nine percent of the respondents had a land area ranging from 0.1 to 0.5 hectares. Fewer households (8.8 percent) had parcels ranging from 0.6 to 1 hectare. Only one respondent (2.2 percent) had over 1.1 hectares. It can be deduced from the figures that many farmers were cultivating very small areas of rice land. The mean landholding was 0.39 hectares. According to the respondents this land size structure had not changed from ten years ago.

8.7 - Tenure

Just over seventy-six percent of the respondents were operating a single parcel, and 78.7 percent of these were tenanted. A few others had a second parcel, most of which were also tenanted. Many fewer reported owning a third parcel which was either owner-

operated or amortized. Three respondents owned but did not operate their farms.

The persistence of share tenancy seems surprising since rice areas were the first to be covered by land reform. It could be that legally, the arrangements have been transformed into formal leasehold but in reality, landowners and their tenants had come up with their own private arrangements acceptable to both.

8.7.1. Ease of buying and price of land

Respondents claimed that it was easy to buy land ten years ago. In fact, only four percent reported that it is difficult to acquire land ten years ago. However, the situation has changed dramatically. Eighty-two percent of the respondents said that it is difficult to buy land at present. Only 18 percent indicated that it is easy to purchase residential land. It is noteworthy that acquiring rice land 10 years ago was much easier and generally cheaper than today. A hectare of rice land, would cost from P51,000 to P100,000 ten years ago. Today, the price of a hectare of irrigated rice land ranges from P201,000 to P400,000. The change in price is not so closely linked with population growth, but may be linked with competition for a finite land base and the ability to pay through remittances. A number of respondents indicated that before there were some vacant lots uncultivated but now they are converted either for crops or for residential lots.

8.8 FGD – Barangay San Isidro – Lowland Rice

A number of questions about change in the lowland rice village were put to a small group representing farmers, house wives, government, the church and youth. The responses to the questions are summarized below.

8.8.1 - On population

The perception of FGD participants is that the population's size and composition has changed. The former was not supported by the census. The FGD participants noted that more had married but

also that more had migrated. In general, the population of the municipality had increased but not their village specifically. It was perceived that the area's population was growing at about two percent a year but this was reduced by heavy out-migration to Cebu, Manila and abroad. The primary impact of an increasing population related to increased costs for food, clothing and education. An increase in population simply made life 'harder'. On a more positive note the villagers saw that with increased population government services increased in range and quality with more schools provided and community centers and the place was livelier with more things to do. People had begun to work more closely together especially in response to the threat of illegal drugs in the community.

8.8.2 - On agriculture

The perception in the village was that agriculture was affected by population change as a larger labor force was present and activities on the farm could be completed more quickly and this was perceived to have led to increasing yields. Improved yields were also related to increasing competition amongst farmers to produce good crops which led to an intensification of agriculture (shorter cropping cycles and attempts at triple cropping of rice in one year or an average of five crops in two years). However, an increase in population also was perceived to be related to a decrease in the area available for cultivation owing to the conversion of agricultural land for residential and commercial use. The overall size of landholdings was decreasing which the villagers saw as an impetus to increase production from their land to compensate. Another coping strategy was increasing the amount of money borrowed for agricultural inputs although this was not always seen as being positive in that high interest charges were onerous. However, as with the drug watch, families were becoming more cooperative in maintaining the irrigation systems and sharing water. They also attended more seminars on how to improve agricultural production. It was questioned how the youth and women were coping with these changes and it was generally felt that the youth were leaving for work in urban areas and the women were carrying a heavier burden on the farm, helping more with planting, weeding and fertilizer application. The women increased their attendance at seminars related to farming.

8.8.3 - *On tenure*

Land tenure is an enduring issue in Philippine villages. The focus group saw some positive outcomes from agrarian reform as implemented locally. First, they believed that the tenure conditions to which they are accustomed did not have any influence on family structure even if land holdings tended to become smaller and smaller. They did, however, see a rather sizable loss for the larger landholder who had lost land as a result of agrarian reform. The current tenure conditions were exacerbating the workload issue for sharecroppers as they now had an additional workload beyond just weeding as they were drawn into more activities in the cropping cycle. This was accepted as long as it ensured them access to a portion of the harvest. The slow progress in agrarian reform was also seen as a factor motivating the youth of the village to migrate for work. Tenure was not seen to be as much an impediment to satisfactory yields as are unstable weather patterns. However, tenure conditions did have a negative impact on earnings as the harvest had to be shared amongst more and more people. This was also related to the sharecroppers' self-esteem as they had to borrow more and more money to stay afloat and this eroded their self-esteem. Disputes in the village can be related to tenure relations as when a harvest is lost, for whatever reason (drought, flood, pestilence) the tenant will often try to avoid paying any rent. Sometimes these disputes reach the barangay captain who is left to adjudicate. There was little consensus on women's and youth's access to land in that it was not perceived to be an important issue as they were seen more as labor units than potential land owners or tenants.

8.8.4 - *On land exploitation*

Changes in land exploitation owing to changes in population and tenure regime were explored. Generally it was agreed that land is currently being more intensively exploited and this included the conversion of more and more agricultural land to house lots. Tenure conditions were not seen to be influencing this intensification or conversion process. Population was implicated as being linked with intensification as the amount of vacant land had diminished to

virtually nothing. Tenure was not linked with changes in productivity, income or how women and the youth exploited land.

8.8.5 - *On productivity*

Productivity in this barangay has improved, in contrast with the conditions in Sta. Paz, Matalom. In the 1970s, it was recalled, yields of rice were about 50 cavans per hectare and today the average was felt to be between 70 and 80 cavans. It was believed that access to improved techniques, fertilizer, certified seeds and training were responsible for the improvement in yield. The group also commented that having a readily available water supply was very important to the success of the application of the modern inputs. If there has been a change in tenure for individual tenants it has resulted in the tenant working harder and being more applied to the family's success. The increased productivity has had some positive spin-offs as it was perceived to have assisted with the payment of debts (even though they had incurred more debts), it had invigorated business and ensured that they could educate their children, which was deemed to be a very important issue.

8.8.6 - *On income*

How local families earned an income was critical to understanding how great a role agriculture played in the village economy. Some of the families engaged in handicraft production, livestock raising and retailing (*sari-sari* store) to expand income generation. Regardless of the extent of alternative income generation it was believed that agriculture still provided 90 percent of the family income. The sending of family members to work in Manila or abroad was also a valid income generation strategy although it was unclear just how much money was remitted by such activity. Tenure systems were seen as a barrier to income generation as the sharing system has either a positive or negative effect depending on whether one is a sharecropper with a ratio of 1 to 2 (1 share for the tenant and 2 for the landowner) or a subtenant when the ratio is one to the subtenant versus four to the landowner. Regardless of the sharing system a system was deemed important as it was understood by both the cultivator of the land and the owner before the onset of

cropping. While it is rarely written down these *sabot-sabot* (verbal arrangements) carry much weight. The growth in population has resulted in an increase in the size of the agricultural labor pool which may have assisted in keeping the costs of agricultural labor in check, especially during the peak times of planting and harvesting.

8.8.7 - *On levels of living*

The perception of the local population on their own condition is important. An informal wealth ranking was conducted and it was agreed that an estimated five percent of the locals could be defined as *datus* or as being 'rich'. There was believed to be a large middle class that represented 65 percent of the population. The remaining 35 percent were deemed to be poor. Tenure was linked to welfare of the population in so far as landowners had more control over their lives and could make independent decisions about the future and the use of their land, and had more latitude for improving the land. One positive aspect of an increasing population was perceived to be the potential increase in services offered by government as a result of greater Internal Revenue Allocation (disbursements from the centre to the periphery are dictated largely by the size of the population in each town).

8.8.8 - *On tenurial changes*

Changes in land tenure systems are at the root of this study. Locally it was believed that whatever change was going to come would originate through the application of government policy rather than through local social action or the seizure of land from landowners. It was strongly felt that those recognized land tillers registered with the local office of the DAR were the only valid claimants to land through the application of any agrarian reform laws, old or new. Therefore the government was seen as the sole agent for change in tenure and it was to them that the population deferred for information even if it was mediated by NGOs or Peoples' Organizations (hereafter POs). They did however have a strong expectation that information should be disseminated to them whenever policy changes were to be made. All the current policies of agrarian reform were acceptable to all sectors of society: the

women and youth, farmers, landowners, tenants and other interested parties.

8.9 - Summary

What emerged from the case study of San Isidro was the lack of urgency in attaining a new form of agrarian reform. Any change that was going to enter the village was to come from outside the village not through pressure from within. What results in these situations is the continued adaptation of the rural community around what they perceive to be a stable, or if not stable then an impenetrable form of resource control through land tenure instruments defined and applied by the state. There is a constant shift occurring in the terms of labor negotiation between those controlling land either as owners or tenants and those that wish to gain access to at least some of the land's produce. These informal negotiations provide an excellent example of societal change without a change in the fundamental aspect of ownership rights to land. This is a concept that will be returned to in the synthesis chapter as it is central to the discussion of the intersection between population dynamics, food security and, in most cases, a lack of dynamism in land tenure systems.

Chapter 9: Plantation Case Study

9.1 - Village profile

The site chosen for this case study is the village of Boroc in Ormoc City. A large part of the village's land was inside the landed estate of the Revillas, a prominent landed family who also owned the Ormoc Sugar Company (OSCO) which operated the first sugar central (processing mill) in the island of Leyte. The population of the village was placed at 1,965 persons as of the last census (2000). It had 318 households. Ten years earlier Boroc had 1,698 people and 295 households. Boroc is the only area of the three study sites in Leyte which registered positive growth in 1990-2000 albeit a modest one (1.46 percent).

Most houses in the village are clustered in the barangay proper and in Sitio Laray, the hacienda barracks, but there are seven other sitios within the barangay. The village is reached via a two-kilometer dirt road from the national highway at the junction in the village of Ipil where the old sugar central was located. This road use to be used more heavily, mainly by trucks hauling cane from the extensive sugar plantations that stretched for many kilometers from the village. No regular public transportation currently serves the village so access is either by contract motorcycles, walking or hitching on the occasional sugar cane truck.

Basic services such as an elementary school, health centre and agriculture extension office are available in the barangay. A village-based preschool and police services are provided by the barangay government. Electricity is supplied by the electric cooperative of the district and running water can be obtained from a free public source through common faucets installed in selected sites within the village.

Boroc has a young population (median age of 17). Forty three percent of its population is under the age of 15 and only 3.7 percent is 65 years and over. It has a child dependency ratio of 80 and a child-woman ratio of 57 (children under five years old per 100 women of childbearing age). There is a surplus of men over women

in the young working ages of 15-39 (a sex ratio of 126 men per 100 women). This is because more young women (55.1 percent) have left the village than men. On the average, female out-migrants were younger than their male counterparts (median age of 23 compared to 28 for males).

All households in Boroc are engaged in agriculture and all household heads (92 percent males and 8 percent females) till the soil. As in the upland and lowland case studies, the typical household pattern of agricultural participation is a couple (husband and wife or father and son) who work on the farm and have young children but no old persons living in the household. Prevalent also are households with more than two individuals working on the farm (most likely the husband, wife and a son); there are small children but no old persons in the household with them.

Household heads in Boroc barely completed grade six and the same is true with their spouses. The children however have generally completed six years of (elementary) education. For the average family, about three children of school age were still in school while one or two were not in school either because they were under school age or had completed up to grade six and were laboring.

9.2 - Land ownership and tenure conditions

The village was settled early because of its favorable location. Its terrain and distance from the main road were probably the principal attractions for early settlement. There were more smallholders than at present. The development of landed estates necessarily reduced the number of smallholders as they lost their land holdings to the estate owners by various means. The village included a few landed estates. The central had since closed, for various reasons. At present, the Revilla estate is under agrarian reform and former workers have been awarded plots of varying sizes. Some 334 hectares of which have been distributed to former workers under the CARP and benefiting about 300 farmers as Agrarian Reform Beneficiaries (ARBs).

The implementation of agrarian reform in Boroc had an interesting history. As with most landowners, the Revillas were not in favour of agrarian reform. They are presently contesting its implementation in the village, thus delaying the full implementation and issuance of titles to the beneficiaries and other assistance programs that are dependent on the completion of administrative requirements. In the early 1990s, a foreclosed portion of the estate was left idle and some workers from the village, expecting that the estate would be subjected to agrarian reform and impatient over its slow implementation, decided to take matters into their own hands. They staked individual claims and cultivated portions of the foreclosed area. Those who were brave enough worked bigger areas while those less daring cultivated only smaller portions while many others did not dare to do so for fear of the landowner. This explains the variation in land sizes of the beneficiaries. In theory, farm workers would get uniform size because unlike share tenants, they did not have a previous claim based on size.

Another portion of the estate has been scheduled for CARP distribution while the area closer to the highway was not foreclosed and remained in the hands of the hacienda. They succeeded in reclassifying it as industrial land thus pricing it at a very exorbitant rate of one million pesos per hectare. Remnants of the hacienda barracks still remain along with the truck and other machinery sheds, the railroad and the perimeter fence.

Most residents of the village are dependent on farming and work as hired laborers for additional income. It is noted that a few farmers diversified their farms and have started adopting Low External Input Sustainable Agriculture technologies introduced by the Rural Development Institute (RDI). RDI-Leyte is a NGO registered under the Securities and Exchange Commission (SEC) in 1996. RDI worked on Land Tenure Improvement (LTI) by facilitating the acquisition and distribution of lands covered by the CARP and in assisting farmer beneficiaries in solving cases that involve asset reform and other agrarian-related disputes. It also assists the farmers to increase productivity through its Productivity Systems Enhancement and Development Program (PSED) by introduction of appropriate technologies to increase farm productivity.

9.3 - Employment

Ninety percent of the 50 families surveyed had from 1 to 3 family members working full-time on their farm. The rest had more, and the average number for all was about two per family. There were more working part-time on the farms at an average of 3.35 per family. Very few (3 families) had other employment in the community. These jobs were either as drivers or helpers. A number of children (46) were working in the city. On the average, nearly every household had one member working in the city but less than half (42 percent) of the households actually had members working in the city (some households had two or more children working in a city). Almost half of them worked either in Manila or Cebu and a few others were in other cities, whilst one worked abroad. They worked as either househelpers, sales clerks or factory workers. Only one household member was reported to have migrated to the city permanently, because of marriage.

9.4 - Income from farming

Income per farm from corn in the last year ranged from P100 to P9,000 with an average of P2,702. Income per farm from copra ranged from P500 to P4,500 with an average of P2,559. For about half (40 percent) of the respondents, sugar production was a good source of farm income and was substantial compared to their other sources. The highest income reported was P500,000 last year.

Eleven respondents raised cattle on their farm and the average income from cattle was P6,254.54. Similarly, twenty respondents raised swine, most of them raising between 1 and 15 head, on average 7.2 head. The mean income per household from swine was P4,049. Twenty-eight respondents raised chickens, mostly raising 25 or less or an average of 24 head. The average income per farm from chickens was P2,334. Total income from livestock production per farm ranged from less than P1,000 to P30,000 and the average was P6,074.

Thirty three households reported having one other source of income. The income from other sources such as wages and remittances ranged from P1,800 to P96,000 with an average of P29,486 per household per year while the total other income was on average P30,249. Adding the farm and other incomes, the average total household income was P66,332 per year or a monthly average of P5,528.

9.5 - Organizational participation

The residents of the village had been organised into cooperatives—the Boroc/Ipil Agrarian Reform Beneficiaries Primary Multi-purpose Cooperative (hereafter BIARBPMPC) and the Boroc Agricultural Multi-purpose Cooperative (hereafter BAMPC). Eighty percent reported being members of a farmers' organization. A few reported being a member of a second organization. These organizations included BAMPC and BIARBPMPC. Forty-two percent reported being members of the latter. Sixty-six percent reported being ordinary members while the rest had various positions such as member of the Board of Directors, chair or member of a committee or auditor or treasurer. The majority (75 percent) of all members had been members for four to six years. They reported that the main project of the organization was lending money to its members.

9.6 - Access to agricultural services

Nearly two thirds (66 percent) reported having contacts with agriculture technologists. Half (52 percent) had contact with one technologist while a few others were in contact with two or three. Most (52 percent) said these were City Agriculture Services Office (hereafter CASO) personnel. Almost all (90 percent) reported having received agricultural information from the agricultural technologist mostly through personal contact. These were primarily on 'correct practices' in farming.

Furthermore, a majority (88 percent) had attended seminars. Nearly half (46 percent) of them reported attending a seminar on integrated pest management (IPM) and the rest were on agribusiness

management, farm planning and sugarcane production. The most frequent sponsors of these seminars were the DA and CASO. Most of the lessons learned were on pest control. A few said they also learned about corn production, sugar cane production, business and agriculture techniques.

9.7 - Credit and land purchases

Almost all FGD respondents said they obtained credit for farming. They either borrowed from their organizations with more of them borrowing from BAMPC than from BIARBPMPC. Credit ranged from P300 to a high of P100,000. Sixty percent reported that interest ranged from 2 to 30 percent. Such a range in interest rates reflects the relationship between the lender and borrower (i.e. relative versus non-relative) and the length of term of the financing.

Eighty percent of the respondents said it was difficult to acquire residential land ten years ago. More (90 percent) said it was still difficult to buy land now. The price of residential land ten years ago was reported to be P1,000 per hectare while now it was P10,000 per hectare. About three-fourths said it was difficult to buy corn land ten years ago and more (90 percent) said it was difficult now. The reported price of a hectare of corn land ten years ago was P10,000 but now it had increased to P80,000. Seventy six percent said it was difficult to buy coconut land ten years ago and more (90 percent) said it was difficult now. The reported price of a hectare of coconut land did not change from ten years ago (at P80,000 per hectare). Rice land was difficult to buy ten years ago according to 76 percent of the respondents but now, 90 percent said it was difficult. Then, a hectare was priced at P60,000 now it was P95,000. Apparently, the respondents reported a more uniform set of prices because of the standardized valuation system for certain farmlands used by the Department of Agrarian Reform.

9.8 - Access to labor

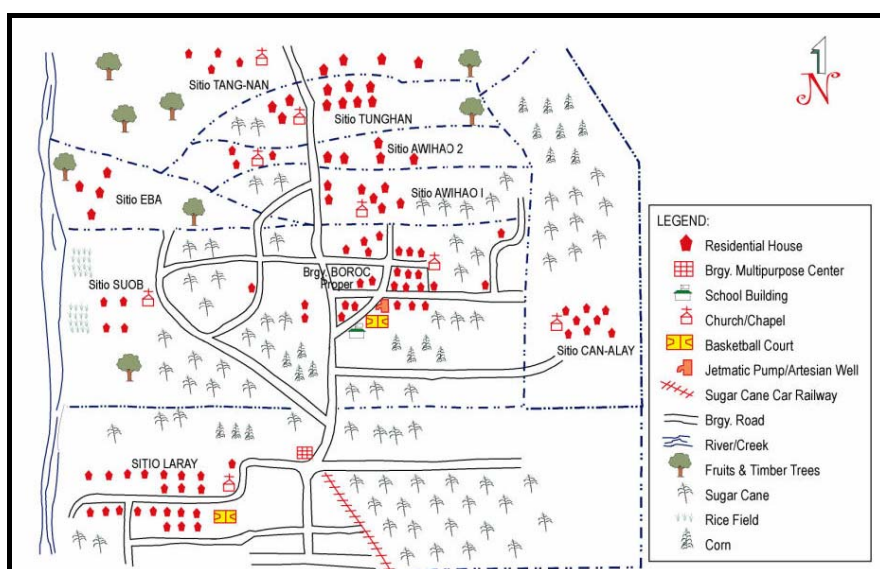
All respondents said it was easy to hire farm laborers ten years ago and nearly all of them said it was still easy now. It was equally easy to hire laborers for ploughing and harrowing with

carabao then and now. Ten years ago the rate for labor with a carabao was on the average P96 per day, mostly between P76 to P100 per day. Now the rate was P150 per day. It was easy to hire laborers without carabao ten years ago and still easy now. The rate was about half that of labor with carabao at P50 ten years ago. Now the average rate was P77. Manual labor for weeding was easy to hire ten years ago and now. The average rate then was P25 per day and it has increased to P75 today.

9.9 - Landuse

Boroc is located south of the city at the foot of the hills that slope gently towards the east. The total land area is 1,211 hectares distributed as follows: 700 hectares agricultural, 160 hectares pasture area, 301 hectares forested and 50 hectares residential. Seventy percent of the total area is flat and the rest is hilly. Most of the village's land is planted to sugar cane. Coconuts are scattered all over the area although not in large concentrations except in the sloping portions. Wet rice is planted in a few hectares in one section (sitio Suob). Corn, the second most common crop, is planted sporadically in certain areas but continuously in others. In certain cases, it is intercropped with sugar cane while in others it is planted along the borders of the sugar fields. Vegetables were also planted but in small patches, normally for household consumption. Fruit trees and timber species were scattered sparsely over the entire area. In general, trees including coconut trees were along roads and inside the settlement areas. A greater concentration of trees could be seen in the upper half of the village. The village's landuse pattern is shown in figure n° 9.1.

Figure n° 9.1 Landuse in Barangay Boroc, Ormoc City, Leyte



Among the sample households, farms were planted almost equally to corn and sugarcane. Those who had a second plot also planted the same crops although a few had rice and coconuts. Those with a third plot also planted corn or sugarcane. The fourth plot was planted to corn.

Despite land distribution, the farmers still planted the ‘traditional’ crop which was sugar cane, a crop supposedly associated only with large operations. The farmers seemed to have realized that one need not own an estate in order to produce sugar cane profitably. This demolishes the argument used by estate owners that sugar cane estates should be left intact because of economies of scale. Despite the lack of technical assistance on the growing of sugar cane, the farmers relied on their experience as cane field workers in order to grow cane successfully. It appears that the basic factor in choosing sugar cane over other crops was economic. It was the impression of many farmers that those who grew sugar cane profited more from farming than those who planted other crops. Respondents pointed out that the capital requirements of sugar cane

were much higher and the waiting time was longer, hence, the really poor farmers could not afford to plant sugar cane.

Almost all of those who planted corn used only one variety which they had been using for years. A few farmers tested new varieties as part of a trial but had stopped using them after the trials were terminated. For sugar cane, the farmers planted whatever material was available in the area. They either produced or bought their planting materials from neighboring farmers. Land preparation for the cane fields was done by hired labor using either carabao or tractor. It was believed that the tractor was cheaper and definitely better than the carabao in terms of speed and depth of ploughing. Farmers used urea and complete fertilizers for various crops although the correctness of the usage can be questioned by the varied dosages reported. This is partly if not principally explained by their lack of technical knowledge and skills in farming sugar cane and lack of resources to buy the recommended kind and amount of inputs.

9.10 - Farm productivity

Production data were sketchy. Thirty-six respondents planted corn during the last 12 months. Corn produced ranged from 1 to 60 bags (weighing approximately 45 kilos each) during the last 12 months with an average production of 9.7 bags per hectare. Six respondents produced copra. Copra production ranged from 1 to 20 tonnes with an average of 9.1 tonnes per hectare. There were 19 respondents who produced sugar cane last year. Sugar cane production ranged from one to 20 tonnes per hectare.

9.11 - Farm size and number of farm plots

The fifty respondents reported farming a total of 85 plots with nearly half of them owning more than one plot, 26 had a second plot; 8 had a third plot, and one had a fourth plot. The average family, therefore, had more than one farm plot. The first plot was 1.03 hectares on average. Some had smaller or larger plots but 52 percent had from 0.26 to 1.0 hectare of land. Of the 26 respondents reporting a second plot, the average size was 1.96 hectares although

most of them (73 percent) had from 0.25 to 1.0 hectare. There were eight respondents who reported a third plot while one reported a fourth plot. The total landholding ranged from 0.125 hectares to 34.5 hectares. The average total landholding was 2.151 hectares, very slightly lower than the 1991 national average landholding of 2.2 hectares. When asked about the size of their land holding ten years ago, most farmers reported no important changes.

Five women were reported to own land ranging from 0.25 to 16 hectares. These were lands that were owned by the women themselves and not by their husbands. It should be mentioned that in official lists of CARP beneficiaries, women's names appear frequently because, according to both men and women, it is the women who commonly attend meetings regarding CARP matters.

9.12 - Tenure

Farmers were mostly (70 percent) amortizing owners of one plot. Some (14 percent) were owner cultivators while others were lessees (4 percent) or share tenants (6 percent). Of the 26 reporting two plots, most (60 percent) of them were also amortizing owners while 24 percent were owner operators. There were a few lessees and share tenants. Eight reported a third plot which was amortized, owned, leased or tenanted. When asked about their previous tenure on all plots, most reported no change from ten years ago. The majority were still amortizing owners.

It should be pointed out that among the amortizing owners, the farm size should have been identical for those who were former workers of the Revilla estate who had no landholdings of their own. Current agrarian reform law (RA 6657) provides that workers and tenants who have less than three hectares are entitled to receive land not to exceed a total of three hectares. Assuming that all workers in an estate had zero landholding, they should have equal share of the estate but the size need not be three hectares because the total size may be smaller and if the workers are many, the share for each would in fact be much smaller than three. In the case of the foreclosed area where workers staked claims much earlier than the DAR assumed responsibility, the areas of the former workers varied greatly. This creates inequality among the beneficiaries.

A complication has arisen over the valuation of the estate because the owners have contested the official valuation and this problem needs to be resolved before the question of payments can be finalized.

The tenure system in Boroc is more equitable than many other areas because the number of owners and would-be owners and lessees is high enough to make the number of tenants insignificant. This is the goal of the agrarian reform program. The challenge now is to make everybody as secure in their tenure as possible by completing the reform process and making the new owners self-sustaining in order to make them complete their payments and stabilize their household economies. Of course, population pressure alone could eventually lead to land fragmentation through inheritance up to a point where currently economically-sized farms would be reduced to uneconomical sizes. But this is not certain, as more people could become landless laborers while farm sizes remain virtually intact.

9.13 - FGD – Barangay Boroc – former plantation

As in the previous case study chapters a number of questions about change in the former sugarcane plantation village were put to a small focus group representing farmers, housewives, government, the church and youth. The responses to the questions are summarized below.

9.13.1 - On population

The focus group in Boroc perceived that their local population has doubled in the last 10 years with the main source for the increase being local births, augmented by in-migration. Regardless of the size of the population many have difficulty meeting their daily needs although the situation has improved by adopting better farming practices, mainly in sugar growing and, through remittances from family members working in the city. Attitudes toward family size were divided between those preferring large and small families: large families are better because they can

help in the farm; smaller families because they have fewer to support. Families today were perceived to have less access to land because of subdivision and sale. Agrarian reform had opened access to land but not for all residents as some were still on a waiting list.

Young people have very few local opportunities for employment other than working on the farm. Moreover, they possess few skills. Those successfully coping with change and who had either maintained or improved their status, were those that worked hard and cut down on vices. Those whose lives had worsened were people who were perceived to have not worked hard enough or had vices like gambling and/or drinking. Younger couples were adopting family planning practices.

9.13.2 - *On tenure*

It was generally felt that those that had security of tenure, or at least access to land, had better economic opportunities than those who did not. In contrast, those who worked on the hacienda were 'controlled' '*kinaptan*' by others and lacked freedom and opportunities. As would be expected the people felt that those who had larger holdings were better off than those who had smaller holdings or none at all. Secure tenure, it was felt, affected productivity in that owners were motivated to work harder, however there were still those who did not work hard despite having improved tenure conditions. Productivity was believed to not be solely a function of tenure but also technology. If one did not use better inputs, yields would be low.

Farm workers received low pay and could hardly meet their needs from their wages alone. Income from farming also depended on the crop and the price of produce. Those who shifted to sugarcane when the price was good had better results although the longer term benefits were harder to predict. Those who benefited from the land transfer were those who dared to cultivate plots from the foreclosed property. Those who dared more had larger areas; those who were less daring had smaller areas or none at all. The land owner intimidated the residents into not doing anything and prevented the DAR personnel from including the estate for agrarian reform. This

did not stop the more powerful locals from claiming land without clearance from the owner. Eventual inclusion of the plantation in the area covered by agrarian reform meant that everybody, including qualified young people, were to be allocated land. Many, if not most, of those listed in the roster of beneficiaries were women (the wives), as they attended meetings and signed the documents. It was generally felt within the focus group that individual ownership of land was the best policy.

9.13.3 - On land exploitation

Land exploitation had not changed much for those who were cultivating on their own and those under the hacienda, even after land was subdivided. Cropping intensity and cropping pattern had not changed very much. Coconuts were planted in some areas, lowland rice in one sitio (Suob), but most areas were planted to sugarcane or corn. The shift to sugar cane for some was a result of the better price of sugar in the last few years and the availability of capital. Production technology was based on their knowledge and experience as farm workers. A hectare would yield about 20 truckloads which would gross about P70,000. Expenses would be about half or slightly over half the gross. The returns will still be better than corn or any other crop. Land preparation using the tractor would be between P5,000 and 6,000. This is a lot faster than using carabao. Estimates of the cost of using a carabao would be higher than the tractor anyway. Another important factor identified in land exploitation was the availability of capital. Those who could not pay for the cost of inputs were forced to plant other crops or scale down their operations or obtain credit in order to meet input requirements. Technologies are not very advanced at present although several training sessions had already been conducted in the village. The quality of sugar production technology used was based only on experience as sugar farm workers—no assistance had come from any government or non-government agency. The family was a major source of labor and this was not expected to change in the near future.

Productivity of common crops such as corn, rice, and coconut, had not improved or increased nor had there been a decrease. However, the sharing of the benefits of their labor had

improved because of the improvement in tenure conditions. Incomes had drastically increased for those who planted sugar on their new land. Other crops have not provided as good a source of income as sugar. Outside income such as remittances from abroad were important for some, and has been manifested in improved living conditions.

9.13.4 - On implementing agrarian reform

Landowners had opposed land redistribution. The beneficiaries feared being the victims of violence. For example, harassment of agrarian reform workers has occurred. One Municipal Agrarian Reform Officer was physically assaulted by the farm manager. Personnel, including the Secretary of DAR, were blocked from entering the estate. There has been harassment of farmers. The barangay captain vowed not to get involved in any future agrarian reform LTI initiatives in the barangay. The owners of the plantation prioritized those who worked and lived in the 'barracks' (workers' compound) and they got preferential treatment ('*maoy hayahay*') in getting access to land. Other parts (lower, near the highway) of the estate were priced exorbitantly (P1 million per hectare) purportedly because the land was reclassified as industrial. All these actions resulted in farmers being scared to act to implement agrarian reform. No new programs to help new owners to establish farms were extended by government. The exception was some training by the NGO CASO. To this day the farmers have yet to finalize their agrarian reform situation although they are cultivating the land that they have personally claimed from the hacienda.

9.14 - Summary

The former plantation economy of Boroc exemplifies the conditions that can prevail when agrarian reform is implemented in the Philippines. The *ad hoc* nature of the allocation of land mirrors that of the claiming of land in the public uplands of the archipelago, whereby the powerful claim first rights, often to the best and greatest areas of land. Then a range of different, less powerful actors enter the area to fill in the gaps and access the more remote, less productive and easily degraded environments. The indecisive application of agrarian reform policy has in this case not necessarily constrained the farmers. Daily life and sustenance must be secured therefore action is taken regardless of the litigation between the State and the landowner. Problems may occur if there is an attempt to reallocate lands as per the guidelines of agrarian reform. What has evolved is likely to persist. There is resistance to State-imposed reallocation, as all the case studies thus far have shown. Rather culturally effective systems of land holding develop i.e. a type of locally-contested and evolved land holding pattern is established that is neither reflected in official records, nor endorsed by the laws of agrarian reform.

Chapter 10: Peri-Urban Case Study

10.1 - Village profile

Of Cebu City's 22 peri-urban barangay, four have been chosen for this study (Table n° 10.1). Two of these barangay, Cambinocot and Agsungot, are defined as fully alienable and disposable (hereafter A&D) land. In the context of the Philippines, this classification means they are private lands that can be freely bought and sold without government intervention. This freedom to buy and sell does not, at least in theory, transcend to the level of landuse planning. National, provincial and local ordinances are in place with the potential to limit the type of landuse that can and will occur on any particular parcel of land. There are also some caveats with regard to government's lack of intervention in the buying and selling of A&D lands. The laws of agrarian reform may impinge on those attempting to acquire an area of land that exceeds limits as defined by the current laws. This is, however, a theoretical limit as a number of methods are used by the population to circumvent it. Details concerning this are discussed elsewhere in this book.

The second type of land, after alienable and disposable land, included in the peri-urban case study, is the so-called forest land (timberland). These lands are public in that they are, in theory, owned and managed by the State. In the Philippines, nearly 60 percent of the country is classified as public land. These lands support over 24 million people or one-quarter of the country's population (Li 2002). These state-owned lands are typically sloping, and in the mountainous interiors of the major islands. As noted, a large number of Filipinos occupy and gain sustenance through cultivation of these marginal lands (Flieger and Cusi 1998). As these so-called forest lands are situated in the urban-rural peripheries of towns and cities, population pressure results in the spill-over of people to the mountainsides searching for a livelihood from uncultivated public lands.

Table n°10.1 – List of 22 barangay in the peri-urban environment of Cebu City

Barangay	Fully Timber-land	All A & D	Partial A & D/ Timber-land	Residential % of area	Agricultural % of area	Commercial % of area	Industrial % of area
Lusaran			✓	.9	99.1		
Cambinocot		✓		.4	99.6		
Paril		✓		.3	99.7		
Mabini		✓		.5	99.5		
Agsungot		✓		2.5	97.5		
Guba		✓		1.2	98		
Adlawon		✓		.3	99.7		
Taptap			✓	.2	99.8		
Tagba-o	✓			0	100		
Tabunan	✓			.23	99.7		
Sudlon I	✓			1	62		37
Sudlon II	✓						
Sinsin			✓	.02	98.4		1.5
Buot-taup			✓	.6	97.5		1.9
Pamutan			✓	.01	99.8		
Toong			✓	3	97		
Sapangdaku			✓	5	95		
Bonbon			✓	.3	69.3	.02	30.3
Babag			✓	2.5	97.4	.03	
Malubog			✓	12	65	1	22 special
Sirao		✓		5.6	93		
Pong-ol/ Sibugay			✓	3	89	6	

Barangay Tagba-o and Sudlon 1 in the peri-urban environment of Cebu City are, by classification, forest lands. They are chosen for this study to exemplify the special issues pertaining to this over-exploited type of land unit and the complications involved in discerning tenurial relationships that have evolved in the area. As

a case in point, Tagba-o is defined by government as forest land but is in fact 100 percent agricultural. Sudlon 1, also classified as forest land, is in reality, 62 percent agricultural and 37 percent industrial.

Of relevance also is a description of the topography of the selected peri-urban barangay which, as already shown in Table n° 10.1 are being used primarily for agriculture despite government's classification of these lands as alienable and disposable and forest lands. If slope and elevation are not taken into account, the total base areas of the barangay are: Agsungot, 5,500 hectares; Cambinocot, 8,600 hectares; Sudlon 1, 5,800 hectares; and, Tagba-o, 9,600 hectares. However, if the contour of the land is taken into account, the surface areas of the barangay add up to 5,800, 8,900, 6,400 and 10,800 hectares, respectively.⁴⁶ Of the four barangay, only Agsungot and Cambinocot have portions with elevation below 200 meters above sea level (5.8 percent and 26.3 percent respectively). The bigger portions of these barangay, however, lie between 200 and 500 meters above sea level (93.2 percent of Agsungot and 73.7 percent of Cambinocot). Moreover, 82.1 percent of the surface area of Agsungot and 51.8 percent of Cambinocot has a slope of 18 percent or more. In contrast, Sudlon 1 and Tagba-o have lands at much higher elevations: 89.5 percent of Sudlon 1 and 18.5 percent of Tagba-o lie 500 meters or more above sea level. Furthermore, more than 80 percent of their lands have slopes of 18 percent or greater.

Although the four case study peri-urban barangay are all within close proximity to Cebu City and are relatively well served by the road network, poverty and underdevelopment are prevalent in the area. This is evident from the socio-demographic profile of the barangay portrayed below, which sets the tone for subsequent discussions of land tenure and food production critical to this study.

⁴⁶ See Flieger and Cusi (1998) for a description of the GIS-based methodology for determining the surface area of mountainous areas. The need for assessing the real surface area of mountainous areas is crucial when attempting to settle land disputes using two dimensional maps as those held by government and used for cadastral purposes.

10.2 - Demographics

In 2000, the four selected peri-urban barangay in Cebu had populations of 1,464 (Tagba-o), 1,746 (Agsungot), 1,959 (Sudlon 1) and 2,271 (Caminocot) (Table n° 10.2). Between 1990 and 2000, the population of Sudlon 1 had grown the most (16.7 percent annually). Caminocot and Tagba-o had growth rates of 3.15 and 3.12 percent, respectively, while Agsungot had the lowest growth rate of 2.74 percent. As mentioned, Sudlon 1 and Tagba-o are classified by government as forest lands while Caminocot and Agsungot are A&D lands. It appears, therefore, that land classification had no bearing on the rate of population growth in these barangay. It is useful to keep in mind, however, that the 1990-2000 growth rates of the four peri-urban barangay exceeded the growth rates of Cebu City and the province of Cebu (1.65 and 2.5 percent, respectively) and even that of the country as a whole (2.3 percent).

In 2000, Sudlon 1 was the most densely populated area of the four peri-urban barangay (337.8 persons per sq. km.); Agsungot was next (317.5 persons per sq. km.), followed by Caminocot (264.1 persons per sq. km.). Tagba-o, the largest barangay in terms of land area and the smallest in terms of population was the least densely populated (152.5 persons per sq. km) of the four case study barangay.

A survey by the Office of Population Studies (OPS) of the University of San Carlos in the 22 peri-urban barangay in 1999 provides additional information about the populations in the case study barangay. In terms of gender composition, it was observed that there were fewer men than women in Caminocot and Sudlon 1 (Table n° 10.3). Particularly in Sudlon 1, there appears to be an acute shortage of men in the prime working ages (15-39); there were only 75 men per 100 women in this age group. In the other three barangay, men outnumbered women in the prime working ages, and for Tagba-o there were more men than women in practically all age groups.

Table n°10.2 – Population size, growth rate and density of Cebu peri-urban case study barangay.

BARANGAY	MAY 1990 No. of Total hhlds pop.		MAY 2000 No. of Total hhlds pop.		GROWTH RATE ¹ (1990-2000)	BASE AREA	POPULATION DENSITY ² (2000)
Agsungot	250	1,327	352	1,746	2.74	5.5	317.5
Cambinocot	332	1,657	483	2,271	3.15	8.6	264.1
Sudlon 1	80	369	403	1,959	16.7	5.8	337.8
Tagba-o	212	1,072	288	1,464	3.12	9.6	152.5

Source: 1990 and 2000 Censuses

¹ Growth rates use the exponential function.

² Population density is number of persons per sq. km.

In terms of age composition, Sudlon 1 had the youngest population (median age of 16) while Tagba-o had the oldest (median age of 21). 47.6 percent of Sudlon 1's population is under age 15 compared to the 38.7 percent of Tagba-o's population in that age category. With a relatively young age structure, it is not surprising that all four peri-urban barangay display high levels of dependency burden. Most noticeable is Sudlon 1 with a dependency burden of 100, meaning that on average, each person of working age has one 'dependent' (person aged 0-14 or 65 and older). In 95 out of 100 cases, the dependent is a person under 15 years of age. For Tagba-o, the dependency burden is much lower: 75 dependents per 100 individuals of working age and 68 of these dependents are under age 15.

The child-woman ratio is the ratio of the number of children under five years old to the number of women of reproductive ages (15-49). It serves as a proxy measure for fertility. As Table 10.3 shows, fertility levels were relatively high in the four peri-urban barangay. It was conspicuously high in Sudlon 1 (child-woman ratio of 84 children per 100 women of reproductive age). With the exception of Cambinocot, the peri-urban case study barangay had

child-woman ratios that were higher than those of the province (0.59) and the country (0.54) in 1995.

Table n° 10.3 – Selected demographic characteristics of the Cebu peri-urban case study barangay

	Agsungot	Cambinocot	Sudlon 1	Tagba-o
Sex ratio				
All ages	99.5	96.4	89.5	102.3
Ages 15-39	102.9	113.2	74.5	109.8
Ages 40-64	93.9	78.9	100.0	104.3
Median age	19	18	16	21
Percent of population:				
Age under 15	42.1	41.0	47.6	38.7
Age 15-64	53.5	53.0	50.0	57.2
Age 65 and over	4.4	6.0	2.4	4.1
Dependency ratio	86.9	88.7	100.0	74.7
Youth	78.6	77.4	95.2	67.5
Old age	8.3	11.3	4.8	7.2
Child woman ratio	0.636	0.531	0.839	0.656

There is very limited data on migration in the peri-urban barangay. The OPS survey revealed that 10.5 percent of the sample households in Cambinocot, 7.7 percent in Sudlon 1, 7.3 percent in Tagba-o and 4.4 percent in Agsungot were households that moved into the barangay only in the last five years. With respect to out-migration, no data are available at the barangay level. Nonetheless insights can be drawn from data for the entire peri-urban Cebu. Out-migrants in the peri-urban barangay in the last 10 years are characterized as predominantly female (55.1 percent) and 23 years old, on average. The majority left because of marriage (a reason more applicable to the women than to the men) and, to a lesser extent, because of employment (17.0 percent). Some expressed a general feeling of discontent in the area (12.0 percent). Men

preferred to move to another rural barangay (67.7 percent of men compared with 44.8 percent of women), while the women preferred to go to the cities (42.1 percent moved to Metro Cebu and 10.6 percent went to Manila or overseas). This suggests that men could be in search of agricultural opportunities while women are in search of urban employment. Seventy-one percent of out-migrants did not send remittances home; only 13 percent sent remittances to their families on a regular basis. This pattern was the same for both men and women migrants. It may be inferred, therefore, that out-migration did little to improve the conditions of residents in the peri-urban areas even if it may have improved the condition of the out-migrant himself/herself.

10.3 - Socioeconomic status

Nearly all the households in the peri-urban barangay own the house they live in although few households own the land on which the house is built. The concept of homelessness is not recognized in the Philippines as it is culturally unacceptable to deny a person a roof over his or her head. But this is often as far as the concept goes, in that land owners may permit people to build a house on their land and these home builders will own the materials from which the house is built, but as noted, not the land on which it sits. The same is usually true of houses built on public lands in the hinterland. Often people will allow others to build houses on their land simply so that someone can keep watch on the land, or act as a tenant for the landowner. The lack of clear title to the land on which a house is built, in part, helps to explain why many houses are built of light materials. Sometimes houses must be moved and heavy materials (concrete blocks in particular) cannot be easily shifted.

The provision of water and toilet facilities is also poor in the peri-urban barangay. Only half of the households in the alienable and disposable lands of Agsungot and Cambinocot and one-fourth of those in the so-called timberlands of Sudlon 1 and Tagba-o reported having a toilet. A majority of households draw their water from local springs and carry it to the house. Two of the villages studied, Agsungot and Cambinocot, are well connected to the electrical grid but still only slightly over half the households choose to access electricity. The other villages, Sudlon 1 and Tagba-o, do not enjoy

wide distribution of electricity and usage is markedly lower at less than 20 percent of households.

Educational attainment is often used as an indicator of development. Residents of the more remote villages with low usage of electricity also have significantly lower levels of educational attainment at the elementary and high school levels. However, Tagba-o exceeds the other barangay in educational attainment at the level of post secondary education. Overall, residents of Agsungot fared better than the rest in terms of education.

The peri-urban households have, on average, at least three sources of income (Table n° 10.4). Of the four barangay in this study, Agsungot has the largest average household income. It also has the largest proportion of households earning income from wages (64 percent) as well as the largest average income coming from wages. In addition, nearly half of the households in Agsungot operate a small business. Because of these other non-farm income sources, Agsungot has the highest average household income among the four peri-urban barangay. Sudlon 1, however, has the largest average income from farming. Tagba-o ranks second, even if it has the largest proportion of households that earn income from farming. While predominantly a farming village, a few households in Tagba-o earn relatively high income from business. However, business is not widespread in the community.

Table n° 10.4 – Median household income in the studied peri-urban barangay: 1999

<i>Household Income in past year</i> (1998, in Philippine Peso)	Agungot	Cambinocot	Sudlon 1	Tagba-o
From farming				
Median	3,000	1,938	9,525	6,313
No. of cases	46	60	40	46
From livestock				
Median	2,743	1,465	2,298	3,199
No. of cases	27	35	23	26
From business				
Median	18,10	13,50	9,925	27,80
No. of cases	0 34	0 29	8	0 16
From wages				
Median	31,20	21,04	14,97	15,60
No. of cases	0 44	5 42	6 22	0 22
Total income incl. other sources				
Median	41,10	26,54	29,02	21,10
No. of cases	7 69	0 85	7 51	5 53
No. of Income Sources (%)				
1	1.5	3.5	1.9	1.8
2	15.9	8.1	13.5	20.0
3	29.0	50.0	51.9	41.8
4	43.5	34.9	30.8	27.3
5 or more	10.1	3.5	1.9	9.1
Mean	3.4	3.3	3.2	3.2
Total number of observations	69	86	52	55

10.4 - Agricultural participation

Despite the low contribution of agriculture to total household income in the peri-urban barangay in comparison to wages and other income sources, it is evident that agriculture is the prevalent economic activity of households in the case study barangay. On the average 2.5, 2.2, 2.1 and 2.6 working household members in Agsungot, Cambinocot, Sudlon 1 and Tagba-o are working in agriculture. The prevalence of agriculture as an activity, yet low contribution to total household incomes, signifies just how low productivity is on these hillyland farms. Even among the few female household heads (10 percent), two-thirds are in agriculture. Agsungot stands out in that it has the largest proportion of households (43 percent) whose heads work outside of agriculture. As shown earlier, residents of this barangay derive a considerable fraction of their income from wage employment and business. Agsungot is located along a good quality transport route that links the village with Cebu City. Of the four peri-urban barangay, the options for non-agricultural employment are therefore greatest for people in this barangay. The opposite can be said of Tagba-o, a remote barangay poorly connected via transport to the urban environment of Cebu. It is also situated on the far side of a steep valley system and is primarily agricultural in its orientation. Thus, it has the largest proportion of households whose heads are engaged in agriculture (87.3 percent).

With respect to household composition and the extent of household members' participation in agriculture (Collomb's second index) (see Appendix 1), some variability can be observed in the four peri-urban barangay that is consistent with income patterns discussed above. In Agsungot, where a large fraction of household income comes from wages and business, 30.4 percent of the households reported not having any household member working in agriculture (category 1 of Collomb's index). Among households engaged in agriculture, the largest group (20.3 percent), consisted of households with young children (under 15 years old) but no old persons (65 and over) and with two persons (a man and a woman, or both men) working in agriculture (category 39 of Collomb's index). The same two categories (1 and 39) are prevalent in Cambinocot (20.9 and 17.4 percent, respectively), even if the proportion of

households in the first category is significantly smaller. A third category is also evident in Cambinocot (12.8 percent). These are households with only one male member working in agriculture and a women who is not in the labor force (possibly in reference to the household head and his wife), with one or more children under 15 years of age, and no person aged 65 and over in the household (category 19 of Collomb's index). In Sudlon 1, this category is the most prevalent (25.0 percent), followed by category 39 (19.2 percent). In Tagba-o, category 39 is the most common (29.1 percent), while a fourth category is likewise noticeable (20.0 percent). This consists of households with more than two people working in agriculture (all men or with at least one woman), with one or more children in the household but no old persons (category 55 of Collomb's index). The prevalence of this category is indicative of the intensity of agricultural participation of the residents in Tagba-o relative to their counterparts in the other peri-urban barangay.

With agriculture as the predominant activity in the peri-urban barangay, it is useful to know the farming status of the agricultural workforce in these communities. The data show that 70 percent or more of those working in agriculture in the peri-urban barangay are tenants. Those who own all or part of the land they till barely exceed 20 percent. The remainder consists of hired laborers and unpaid family workers.

10.5 - Landuse, farming patterns and agricultural productivity

As shown, the studied peri-urban barangay vary in demographic, socioeconomic and topographic characteristics. So also do they vary by predominant landuse types. Nonetheless, the dominant grain crop in the area is corn. Cebu Province, wherein Cebu City's peri-urban environments are located, is one of the most important corn producing provinces in the country. This is distinctive because the majority of the Philippines is predominantly planted to lowland rice. It is Cebu's sloping lands and lack of water for sustained wet rice production that has dictated the type of landuse for the province. In three of the four peri-urban barangay studied, corn is the dominant grain crop. Only in Cambinocot does rice supersede corn. This is because Cambinocot is located in the

basin of a watershed and has more flat land (48.2 percent of land sloped at less than 18 percent versus an average of only 15.7 percent for the other three barangay) and of lower elevation, giving it superior access to surface water resources. In all four barangay, rootcrops are grown as a supplemental food source to the dominant grain crop.

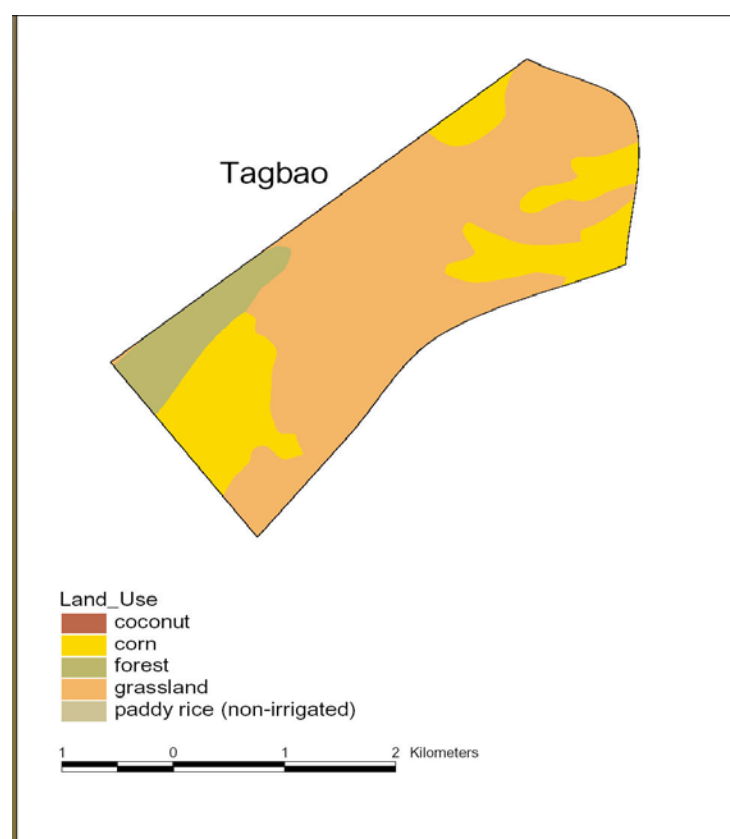
Sudlon 1, Tagba-o and Agsungot all have lands above 500 meters in elevation which is conducive to the cultivation of temperate vegetables and cut flowers primarily for the market (Table n° 10.5). In comparison to grain crops, these are relatively minor products with the exception of mango, a high value crop typically grown in Tagba-o and Sudlon 1 for the export market.

The dominant food crops, corn and rootcrops, are stable in terms of their area and cultural significance in the local agro-ecosystem. Both have been cultivated for at least 500 years and hence the potential for change in this dominant landuse would appear limited. The more dynamic sectors are in the areas of fruits, vegetables and cut flowers. All three are relatively new in the peri-urban environment. Mango and cut flowers became more widely incorporated in the farming system in the last 20 years and vegetables in the last 30 to 40 years. The difference between the traditional and new sectors is the relative stasis in the dominant food crops versus the dynamism in the largely market-oriented products of fruits, vegetables and flowers (Figures n° 10.1; n° 10.2; n° 10.3 and n° 10.4).

Table n° 10.5 – Major and minor landuses for selected barangay
(CCLUC, 1998)

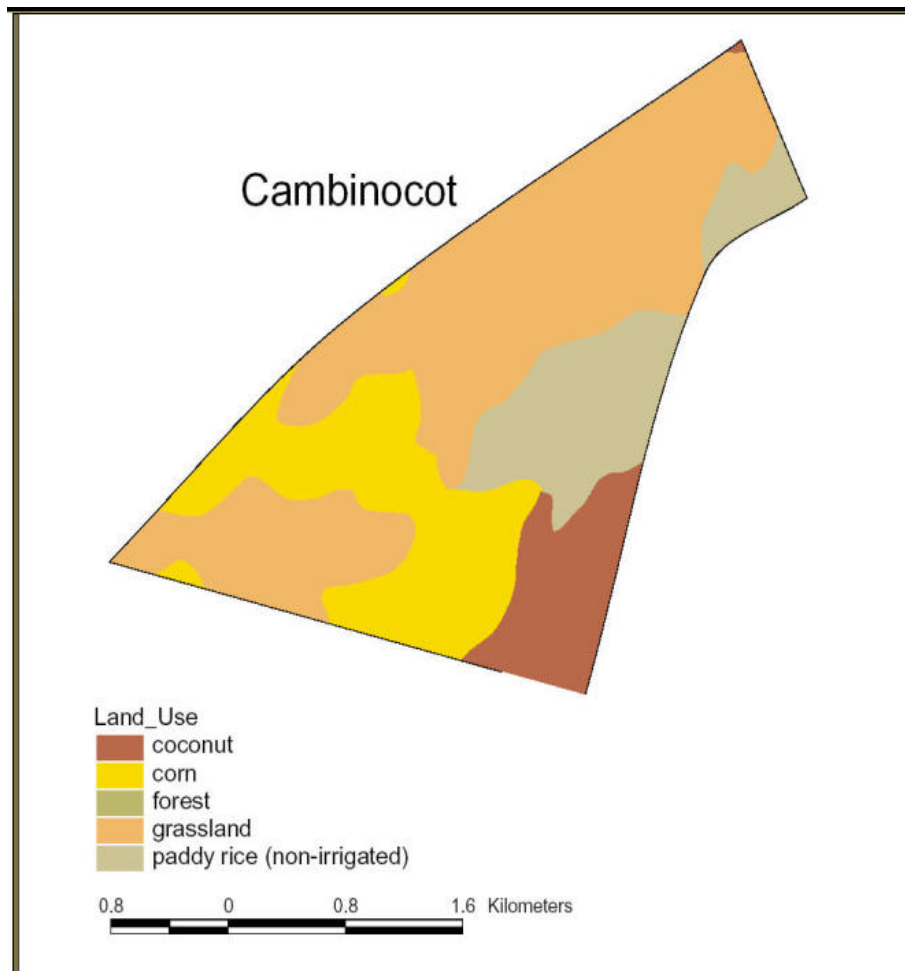
Barangay	Major crop types cultivated
Agsungot	Corn, vegetables, coconut, bamboo, banana, fruits
Cambinocot	Rice, corn, coconut, banana, vegetables, livestock
Sudlon I	Corn, mango, vegetables, mango, bamboo, livestock, fuel wood, charcoal
Tagba-o	Corn, vegetables, mango, coconut, fruits, banana, cut flowers, livestock

Figure n° 10.1 – Major landuse in barangay Tagba-o



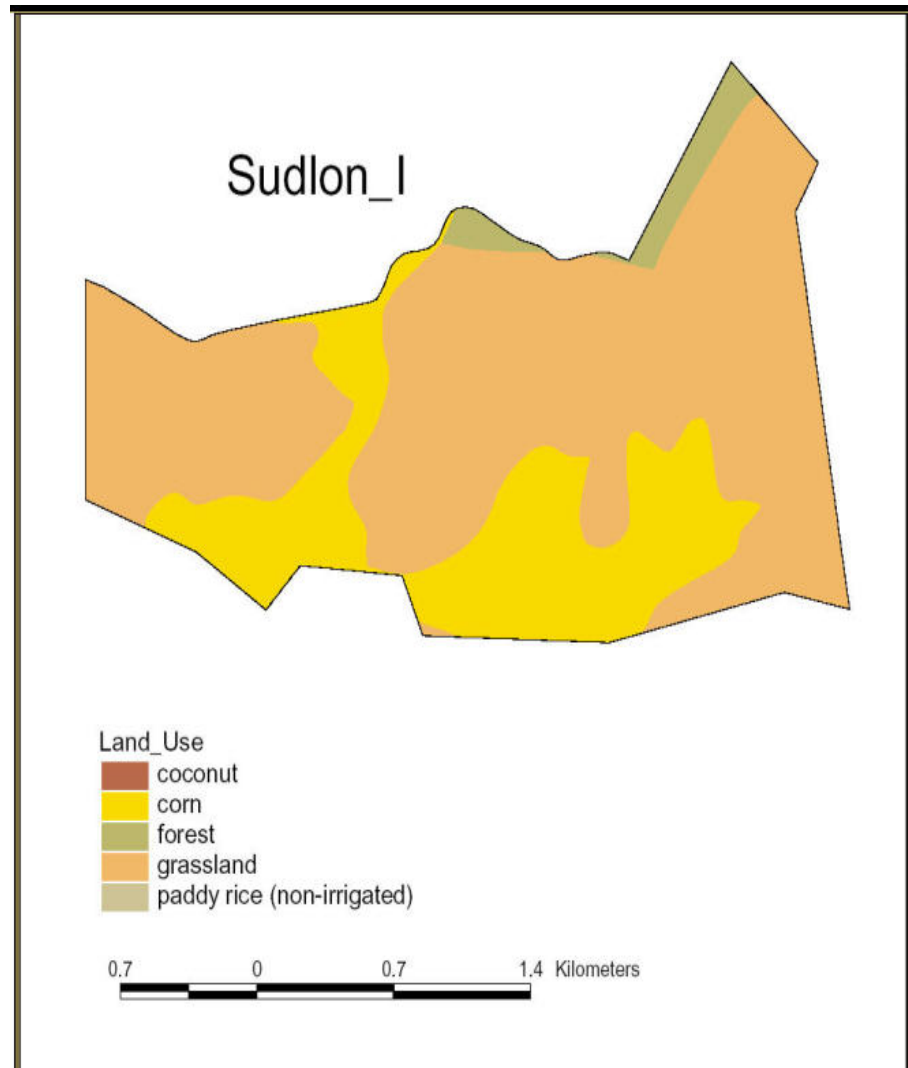
Source: DENR 2000

Figure n° 10.2 – Major landuse in barangay Cambinocot



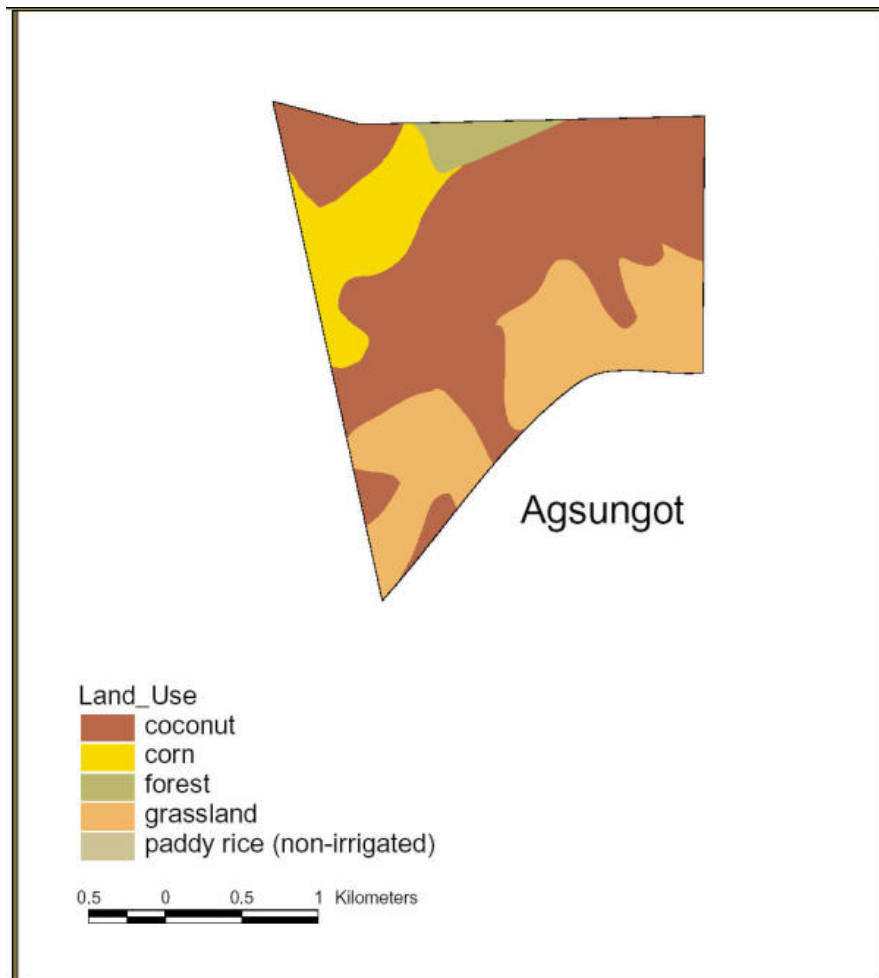
Source: DENR 2000

Figure n° 10.3 – Major landuse in barangay Sudlon I



Source: DENR 2000

Figure n° 10.4 – Major landuses in barangay Agsungot



Source: DENR 2000

The overall productivity in Cebu's peri-urban barangay is very low by national standards. As noted, the environment consists of wide areas of steeply sloping lands, an underlying geology composed largely of limestone, very shallow and erosive soils and a corn-based cropping system that is extractive and poorly suited to sloping lands.

The dominant grain crops, corn and rice, have both been identified as poor producers with a wide margin for improvement

(Table n° 10.6). Corn yields on average are only 0.44 metric tonnes per hectare with a potential upper limit for production being 2.55 metric tonnes per hectare (this is still well below the yield potential of other corn growing provinces such as Leyte which has a current yield of approximately 1.5 metric tonnes per hectare and potential of around 4.0 metric tonnes per hectare). Similarly, rice yields are only 1.45 metric tonnes per hectare with a potential yield of 4.00 metric tonnes per hectare. The key limiting factors for reaching these potentials are an unreliable water supply, degraded soils, lack of inputs and poor seed stock. Rootcrops and vegetables also suffer from poor production per unit of area. Only mango production has approximated its production targets for unit of area.

Table n° 10.6 – Comparison in 1987 of the potential area and yield of selected agricultural crops, Central Cebu Hillylands (Cebu City, 1987).

Agricultural crops	<i>Conditions in 1987</i>				<i>Potential Growth</i>			
	Area (Ha)	Ave. yield (metric tonnes/Ha)	Ave. cropping intensity	Total Prod'n (M.T.)	Area (Ha)	Ave. yield (metric tonnes/Ha)	Ave. cropping intensity	Total Prod'n (M.T.)
Rainfed paddy rice	290	1.45	1.00	420	352	4.00	1.0	1408
Corn	3947	0.44	1.04	1760	965	2.55	1.04	2559
Rootcrops	413	4.82	1.00	1991	1/	12.50	1.00	5162
Vegetables	623	2.52	1.25	1962	385	10.50	2.00	8085
Mango/other fruit trees	2085	6.46	-	13469	7868	7.75	-	60977
Coconut	2883	0.78	-	2248	4082	1.40	-	5714
Banana	439	7.10	-	3045	1/	10.50	-	4505

1/ Rootcrops and bananas are treated as part of the coconut-based cropping system over the long term.

Farming in the peri-urban study barangay was not always for cash (Table n° 10.7). Between one and two thirds of farming households farmed mainly for home consumption. This was

especially the case in Cambinocot and, to a lesser extent, in Agsungot. In the public lands of Sudlon 1 and Tagba-o more farmers sold their produce. The reported amount sold was always significantly larger than the reported amount consumed.

Table n° 10.7 – Production as reported by amount of production sold and consumed by household in pesos

Barangay		Mean	Std. Dev.	No. of Cases
Agsungot	Amount sold	2392	6159	83
<i>(A&D)</i>	Amount consumed	764	1481	158
Cambinocot	Amount sold	3079	8237	76
<i>(A&D)</i>	Amount consumed	1008	1588	195
Sudlon 1	Amount sold	6232	9527	81
<i>(Timber land)</i>	Amount consumed	1589	2444	130
Tagba-o	Amount sold	7980	14475	92
<i>(Timber land)</i>	Amount consumed	1965	4480	144

Source: OPS 2000

As explained earlier, farmers may plant on more than one parcel of land to expand production and minimize risks associated with the vagaries of weather and pestilence. In the four studied barangay the number of parcels cultivated per farming household ranged between one and six. The mean number of parcels per farm was 1.6 in Cambinocot, 1.8 in Agsungot, 1.9 in Tagba-o and 2.0 in Sudlon 1. This shows the number of farm parcels to be slightly greater for those cultivating in the public land than for those in the alienable and disposable barangay (Table n° 10.8). The mean size of the parcels ranged between 4,365 square meters (Sudlon 1) and 9,001 square meters (Tagba-o). However, the larger or smaller-sized parcels were not restricted to either alienable and disposable lands or public lands.

Nearly half (48.1 percent) of all the farms in the studied barangay were one parcel farms. A further 30.3 percent were two parcel farms and only the remaining 21.6 percent consisted of farms

of between three and six parcels (Table n° 10.9). The A&D lands had more one and two parcel farms, while the public lands had more farms with three or more parcels.

Table n° 10.8 – Parcel number and parcel size for studied barangay in sq.m.

Barangay	No./Size of Parcel	Mean	Std. Dev.	No. of Cases
Agsungot (A & D)	No. of parcels	1.8	1.0	97
	<i>Size (sq. m.)</i>	6,270.6	9,913.0	97
Cambinocot (A & D)	No. of parcels	1.6	0.8	131
	<i>Size (sq. m.)</i>	5,219.3	6,094.0	131
Sudlon 1 (Timber land)	No. of parcels	2.0	1.1	114
	<i>Size (sq. m.)</i>	4,365.1	3,388.1	114
Tagba-o (Timber land)	No. of parcels	1.9	1.0	107
	<i>Size (sq. m.)</i>	9,001.4	37,136.6	107

Source: DENR 2000

Table n° 10.9 – Number of parcels operated by households in studied barangay.

No. of parcels	Agsungot	Cambinocot	Sudlon 1	Tagba-o	Total
1	50	69	47	50	216
2	28	44	33	31	136
3	12	15	21	16	64
4	5	3	10	9	27
5	1	0	2	1	4
6	1	0	1	0	2
Total	97	131	114	107	449

Source: DENR 2000

10.6 - Tenure, acquisition of land and land holdings

Land tenure is a highly volatile issue in peri-urban Cebu (Tables n° 10.10 and n°10.11). Land used for basic survival by poor farmers is also sought by affluent urban investors who wish to develop it for commercial interests. The area is a critical watershed as the primary source of potable water for the rapidly growing and industrializing Metro Cebu area. However, with the influx of investors and new residents, there are public forest lands with increasing population densities that are devoid of forest. There are public lands that have been titled in contravention of Philippine laws. Moreover, competing claims have been made to the same area of land to the point where some barangay have tax claims for 150 percent of the area of the actual village (CCLUC, 2000).

Table n° 10.10 – Status of ownership of residential lands as of 1997-98

Barangay	Classification	Owners of Residential Land		Tax Declaration	
		Resident (%)	Absentee (%)	Titled (%)	Untitled (%)
Cambinocot	A & D	83	17	-	100
Agsungot	A & D	88	12	13	87
Tagba-o	Timberland	-	100	-	100
Sudlon I	Timberland	74	26	5	95

Source, CUSWF, 1998

Table n° 10.11 – Status of ownership of agricultural lands as of 1997-98

Barangay	Classification	Owners of Agricultural Land		Tax Declaration	
		Resident (%)	Absentee (%)	Titled (%)	Untitled (%)
Cambinocot	A & D	55	45	8	92
Agsungot	A & D	53	47	11	89
Tagba-o	Timberland	33	67	-	100
Sudlon I	Timberland	34	66	9	91

Source, CUSWF, 1998

A survey of the peri-urban barangay of Cebu City was conducted by the NGO, Cebu Uniting for Sustainable Water Foundation (CUSWF) in the late 1990s. This study explored the means by which persons acquired titles or tax declarations for land in the city's peri-urban barangay (Table n° 10.12). It is important to look into the manner by which property is acquired because this has implications for land tenure security. A great majority of land was acquired using tax declarations rather than full titles and these are extremely stable from year to year. This recording system does, however, mask a very different reality. Land is often distributed to different family members, sold, mortgaged or some other change in control in cultivation occurs. These transactions are never recorded in public records as a cost is involved in doing so. The only time that a transaction is likely to be recorded is when a sale occurs outside the family or if there is a dispute within the family over allocation of land and the only recourse is to file for a change in tax declaration or title. Therefore, data of this sort while interesting, is actually masking a reality in terms of control of resources that can be vastly different from what is recorded in the archives. This pertains not just to peri-urban Cebu but to many areas of the country.

Table n° 10.12 – Property acquisition of agricultural lands as of 1997-98

Barangay	Classification	GR ¹ (%)	TR ² (%)	TL ³ (%)	TI ⁴ /SI ⁵ (%)	ST ⁶ /GT ⁷ (%)	TN ⁸ (%)	No. of lands
Cambinocot	A & D	97	-	2	-	1	-	598
Agsungot	A & D	92	-	4	3.5	0.5	-	376
Tagba-o	Timberland	97	-	1.4	-	1.4	-	147
Sudlon I	Timberland	98	-	1.7	0.2	0.2	-	598

Source, CUSWF, 1998

GR¹ = General Revision, coded by the City Assessor meaning no changes occurring in the tax declaration except for market value. Same owner as with the previous tax declaration.

TR² = Transfer of the property to another person but not indicated in the tax declaration whether through sale, inheritance or otherwise.

TL³ = Transfer General Revision, coded by the City Assessor meaning no changes occurring in the tax declaration except for market value but with different owner from the previous tax declaration.

TI⁴ = Transfer of property to another person through inheritance.

SI⁵ = Subdivision and transfer of property to another person through inheritance.

ST⁶ = Subdivision and transfer of property to another person.

GT⁷ = General revision and transfer of property to another person.

TN⁸ = Transfer of property to another person through donation.

10.7 - How land is held

There are two government-defined forms of land holding supported by the Philippine legal system. However, there are a plethora of other land holding arrangements that apply in nearly all situations. The most formal and legally binding form of land ownership is full title. In the barangay studied the land area held in this manner is minimal (Tables n° 10.13, n° 10.14, n° 10.15 and n° 10.16). Overall, only 5.88 percent of the land in the four barangay is held by a full title. A full title is defined as land that has been formally surveyed and staked as to its boundaries and its land area has been formally computed. The majority of the lands in the four peri-urban barangay held under a so-called tax declaration. The area covered by this type of ownership category is 93 percent. The balance of the area is made up of lands held under a special category by the government (schools, roads etc). Tax declarations do denote the size of the parcel being taxed and the type of landuse occurring. In theory, these tax declarations cannot be used in the court of law when resolving land ownership or boundary disputes. They are, however, the de facto means for defining land ownership as they are in a sense free (there is no charge for the initial survey) as this is paid for by the State in its desire to define lands for taxation.

Table n° 10.13 – Barangay of Cambinocot's (A & D land) pattern of property acquisition between 1980¹-98
(See table n° 10.12 for explanation of acronyms such as GR)

Category	1980-84	1985-89	1990-94	1995-98
GR				
LO ²	136	161	192	199
Tdec	184	240	267	275
TR				
LO	3	17	7	0
Tdec	3	18	11	0
TL/CL ³				
LO	0	0	3	10
Tdec	0	0	3	10
TI/SI				
LO	0	0	2	6
Tdec	0	0	2	9
TN				
LO	0	0	1	1
Tdec	0	0	1	2
ST/GT				
LO	0	0	0	3
Tdec	0	0	0	3
LD ⁴ /DC ⁵ /ND ⁶				
LO	1	4	13	0
Tdec	1	4	14	0
UI ⁷	111	37	1	0
Total				
LO	140	182	218	219
Tdec	188	262	298	299

Source, CUSWF, 1998

¹ The MICS started in 1989. Data processed by the MICS from Tax Declarations were those starting from 1980.

² Land owner.

³ Consolidation and transfer of property to another person through sale.

⁴ Land declared for the first time.

⁵ Newly discovered land.

⁶ Newly declared property.

⁷ Unavailable information or no recorded previous transactions. This would also mean 1980 origin of the property was not established.

Table n° 10.14 – Barangay of Agsungot's (A & D land) pattern of property acquisition between 1980¹-98

Category	1980-84	1985-89	1990-94	1995-98
GR				
LO ²	181	245	274	274
Tdec	249	344	371	371
TR				
LO	15	25	19	0
Tdec	16	29	23	0
TL				
LO	0	0	4	15
Tdec	0	0	6	18
TI/SI				
LO	0	0	0	11
Tdec	0	0	0	14
TN				
LO	0	0	0	0
Tdec	0	0	0	0
ST/GT				
LO	0	0	2	3
Tdec	0	0	2	3
LD ³ /DC ⁴ /ND ⁵				
LO	7	8	1	0
Tdec	7	8	1	0
UI ⁶	134	25	3	0
Total				
LO	203	278	300	303
Tdec	272	381	403	406

Source, CUSWF, 1998

¹ The MICS started in 1989. Data processed by the MICS from Tax Declarations were those starting from 1980.

² Land owner.

³ Land declared for the first time.

⁴ Newly discovered land.

⁵ Newly declared property.

⁶ Unavailable information or no recorded previous transactions. This would also mean 1980 origin of the property was not established.

Table n° 10.15 – Barangay of Sudlon's (Timber land) pattern of property acquisition between 1980¹-98

Category	1980-84	1985-89	1990-94	1995-98
GR				
LO ²	357	439	472	462
Tdec	454	603	619	591
TR				
LO	20	3	13	0
Tdec	21	3	15	0
TL				
LO	0	0	0	15
Tdec	0	0	0	23
TI/SI				
LO	0	0	3	7
Tdec	0	0	6	7
TN				
LO	0	0	0	0
Tdec	0	0	0	0
ST/GT				
LO	0	0	12	27
Tdec	0	0	13	39
LD ³ /DC ⁴ /ND ⁵				
LO	8	31	0	0
Tdec	9	31	0	0
UI ⁶	176	23	7	0
Total				
LO	385	473	500	511
Tdec	484	637	653	660

Source, CUSWF, 1998

¹ The MICS started in 1989. Data processed by the MICS from Tax Declarations were those starting from 1980.

² Land owner.

³ Land declared for the first time.

⁴ Newly discovered land.

⁵ Newly declared property.

⁶ Unavailable information or no recorded previous transactions. This would also mean 1980 origin of the property was not established.

Table n° 10.16 – Barangay of Tagba-o's (Timber land) pattern of property acquisition between 1980¹-98

Category	1980-84	1985-89	1990-94	1995-98
GR				
LO ²	89	109	119	123
Tdec	112	132	141	144
TR				
LO	3	1	3	0
Tdec	3	1	4	0
TL				
LO	0	0	2	3
Tdec	0	0	2	3
TI/SI				
LO	0	0	1	0
Tdec	0	0	1	0
TN				
LO	0	0	0	0
Tdec	0	0	0	0
ST/GT				
LO	0	0	0	2
Tdec	0	0	0	2
LD/DC/ND				
LO	0	0	0	0
Tdec	0	0	0	0
UI ³	34	16	1	0
Total				
LO	92	110	125	128
Tdec	115	133	148	149

Source, CUSWF, 1998

¹ The MICS started in 1989. Data processed by the MICS from Tax Declarations were those starting from 1980.

² Land owner.

³ Unavailable information or no recorded previous transactions. This would also mean that the 1980 origin of the property was not established.

All the data presented in this section were derived from government records. These are typically in the form of tax declarations for individual parcels of land. As the data show, very few residents or absentee owners possess titles to the land they own, till or occupy. There are six broad categories of landuse identified for tax purposes in the peri-urban environment of Cebu. These are residential, agricultural, special, commercial, industrial and plantation. Residential lands are those used solely for the purpose of housing. Agricultural lands can be further defined as livestock, poultry, crops or agroforestry. Special landuses include those designated for use by the government and may include education, health facilities, tourism and other undefined and distinctive uses. Commercial land comprises those areas used for the purpose of trading or merchandising without the facilities for manufacturing or assembly facilities. In contrast, industrial lands do include facilities for manufacturing or assembly. Plantation lands are a special category as they are newly classified in this area as lands that have been so designated so that compensation can be paid for road construction and widening projects occurring in the area. Compensation is not paid for the land area but for the value of the trees and crops growing on the land.

For the barangay under consideration for this study, the mean percentage of area devoted to agriculture was 90 percent. The next greatest percentage for landuse (excluding the anomaly of Barangay Sudlon 1) was residential, accounting for one percent of the landuse. Barangay Sudlon 1 was the only barangay with an industrial component and this accounted for 37 percent of the land area in that barangay. These figures, bar Sudlon 1, are representative of the entire peri-urban environment of the city of Cebu. A total of 22 barangay form the peri-urban environment for the city of Cebu and agricultural is the predominant landuse at 82.7 percent. Industrial uses cover 10 percent of the area and residential 2 percent. The special category is 5 percent and commercial 0.3 percent. Plantation areas, in this case referring to plantation-style production systems such as the historical situation in the Ormoc case study, are very minor. The latter categories are of minor importance to this study and are not present in the barangay chosen for more detailed analysis.

As would be expected, the areas of titled land in the barangay technically defined as public land was less than in the alienable and disposable areas (4.5 versus 9.5 percent). However, the mere presence of titled land in an area legally defined as public land speaks strongly to the public perception of these public lands and the legal complications involved in keeping them as such. All the public lands are claimed in this peri-urban setting if not through formal titling then through tax declarations (95.5 percent for public timberlands and 90.5 percent for alienable and disposable lands).

10.8 - Perceptions regarding land tenure in the peri-urban environment

10.8.1 Urban-based stakeholders

A qualitative study (focus group discussion) of various sectors, perception of the peri-urban barangay of Cebu was conducted in 1998 (CUSWF, 1998). Four problem areas were noted: environment, legal concerns, tenurial-cultural problems and the economy. Various groups of people were asked to comment on these issues. For the purpose of this study we only draw attention to the comments about tenure and environment (as a proxy for food security when the comments are clearly related to food production systems).

It was noted by the urban-based stakeholders (persons not residing in the peri-urban barangay studied) that tenure was interwoven with legal issues. The urban residents thought that the farmer-tillers living in the protected areas of the peri-urban environment faced the prospect of eviction and dislocation and that this could have serious social repercussions. Some method for easing the social impact needed to be devised well before any action was considered or implemented. In response to the intertwining legal issues, people expressed dismay at the unclear delineation of boundaries for protected peri-urban environments. They were also concerned that titles had been allocated for protected areas in a manner similar to their issuance in alienable and disposable lands. Similarly, the dispensation of tax declarations for land in protected areas further complicated a difficult situation. The urban-based

NGOs commented on the difficulty of convincing peri-urban farmers to alter their landuse strategies given the lack of training in areas such as alternative livelihood. The NGOs were also concerned that peri-urban land-owners were selling their land to outside interests. In reference to the economy, many groups expressed concern over the rising population pressure in the peri-urban environment and the uneven economic development (change) now occurring in the greater Cebu metropolitan area.

The peri-urban stakeholders had similar concerns to the urban-based sector. They were very anxious over their ownership rights to land. Many only hold tax declarations and they fear that they will never be able to receive titles. Those that already own land outright (whether with title or tax declaration) are fearful that they could eventually lose their land because only tenants who are actual tillers of the land are considered tenured migrants (a target beneficiary group of the Comprehensive Agrarian Reform legislation). Some people were angered and confused by the DENR issuance of titles to influential people who own land in protected areas and/or timberlands. The perception of those farming in the peri-urban environment is that people worked to secure titles so that they could get compensation or sell their lots outright for a much higher price in the future as the land was titled.

10.9 - Constraints to changes in land tenure

A stakeholder analysis was conducted by the City of Cebu to assess views on possible changes to how land could be held in the peri-urban environment of the city of Cebu. Eight different groups were given the opportunity to respond to the question of the legal restrictions that might be imposed if a Presidential Proclamation declared their respective barangay as protected watersheds. The comments were commonly expressed in a narrative noting the cases where one of the focus group members (barangay officials, church workers, women, tenant farmers, land-owner farmers, migrant workers, service sector representatives, and peoples' organizations) dissents from the widely held view.

It was a widely held view that changes in the way land was held in the peri-urban environment would have negative

consequences. For example, a prohibition through a government declaration would seriously compromise the livelihood prospects of the many farmers in the area and such a declaration would be perceived negatively as being simply the machinations of powerful Cebu families who wished to grab the land in question. Similarly, any restrictions placed on the use of agro-chemicals in the peri-urban environment would limit mango production and harm the economic viability of that agricultural endeavor.

10.9.1 - On the issue of land tenure in the peri-urban environment of Cebu City

Many residents hold tax declarations rather than titles to the land and the fear was that they could no longer be converted into a title because of impending watershed laws. They therefore felt insecure as they may be evicted at anytime. This feeling led them to not pay their land taxes as long as the issue of land titling was not resolved. For many, the only avenue they have is the tilling of the land as they can not sell land that is not titled and move elsewhere. Therefore, if a decision is taken by the government to stop titling some of the lands that fall within the watershed area this will be seen by the occupiers of the land as a way to deprive them of their rights to their land. Many were enraged by the thought that the rich and influential persons who owned lands with tax declaration in the area had no difficulty in getting their lands titled. A further complication is that landowners who are not holding titles for their land (but do hold tax declarations) refuse to have their lands tilled because they believe that once a Certificate of Stewardship contract (hereafter CSC) is released, it will be given to their tenants since they are actually tillers of the land. A CSC is a legal arrangement entered into between cultivators of State-owned land and the State. It is a contract whereby landuse and cultivation regimes are restricted to what is considered to be sustainable practices (agroforestry and strict guidelines on the use of fire) that extends for 25 years. It may be renewed for a further 25 years but this provision has yet to be tested.

10.9.2 - On eviction, relocation and compensation

Many tenant farmers fear being evicted from the land they till. They felt that if they are evicted they will not receive any compensation from government. There is also a common feeling that they will not receive the 500 sq. meters of land promised them if they leave to go to a relocation site. In general, the whole policy of relocation and allocation of lands to those programmed for relocation owing to development in the peri-urban environment is poorly communicated to those potentially most affected. A general feeling of disquiet pertained to the failure of the government to declare other areas as protected watersheds (e.g. Talamban). Talamban, it was felt, was not included because some rich and influential families have significant landholdings in the area. A general position was that the government failed to provide services to the people in the peri-urban areas and thus the residents did not have a good idea of possibly more environmentally-friendly alternatives to what is currently occurring. Similarly the DENR was perceived to be myopic in that they only viewed the peri-urban area from an environmental perspective rather than as a landscape inhabited by farmers and their families. Misconceptions of the laws regarding the harvesting of trees resulted in the much reduced planting of trees that could help rehabilitate the watershed.

10.9.3 - On the proclamations declaring their barangay protected watershed areas

Many wished to have the proclamation declaring their areas as protected watershed lifted to allow for the titling of the lands so that they could then get on with planning for a more sustainable watershed with clear title to the land they tilled. Generally, the DENR was seen to have done a very poor job of defining the program and the potential impact on the barangay to be included in the proclamation and this reinforced the perception that

government policies are contradictory in that they cannot seem to help both the people living in the peri-urban watersheds and protect the watershed environment at the same time.

10.10 - Women, youth and land reform

As detailed in the qualitative study, few women and young people are demanding access to land for themselves as individuals. Rather, any demands that are made for land are driven by the family unit which traditionally in the Philippines is represented by the male head of the household. Women's main interest in land reform is in the provision of adequate resources for the maintenance of the family and then access to information and technology that will assist them in adding value to farm produce to increase farm incomes. The youth are not, in general, focused on having a future in agriculture. The negative perception of the vocation of agriculture is reinforced by their parents who strive to educate them for a better life outside of agriculture. Legally, the young and women have rights to own and access land. However, these rights are rarely acted upon by individuals.

10.11 - Access to land owned by the State

The residents in the two villages in the peri-urban case study that are established solely on State-owned land have a host of problems in securing permanent security of land tenure. The prospect of more State land being made available for legal occupation is remote. The peri-urban environment of Cebu is also a critical watershed area from which the majority of the urban areas water resources are sourced. A law is currently under consideration by Congress which will 'lock-up' all remaining state-owned lands in perpetuity and will bring to an end all legal settlement and development activities in such lands.

10.12 - Land tenure security

Security of tenure for the residents of the barangay of peri-urban Cebu is very poor. A set of overlapping land laws and

proclamations undermine any security in tenure. There are protected watersheds, national parks, State-owned lands all with separate laws and interpretations of the rights of persons residing in these areas. New laws and classifications of the peri-urban environment have been recently written for which little to no consultation was made with those living in the areas that have been redefined. Only the affluent and well connected appear to be able to secure legal ownership of land in these critical areas even though the laws state that they should not hold titles to land in these areas. It is a complex situation and one which will not be resolved easily.

10.13 - Nutritional status in peri-urban Cebu

While the currently studied barangay are underrepresented in the study used to describe malnutrition in the uplands of Cebu, the picture across the peri-urban area (from a sample of 30 barangay) depicts a more serious situation (Table n° 10.17). Of the slightly more than 43,000 children weighed, 34 percent were classified as malnourished to the first degree, a further 23 percent to the second degree and 4 percent to third degree. A total of 61 percent of children weighed were classified as in some way malnourished (Cebu City, 1988).

A second analysis of nutritional status was concluded in 1998. In the intervening period the classification system for levels of malnutrition were changed. It is unclear if conditions in the studied barangay actually improved or were influenced by different measures. By 1998 the number of cases of malnutrition in Aagsungot was reduced to 19 cases with 12 of these being assisted through a supplemental food program. The situation in Sudlon 1, however, deteriorated with a reported 60 cases of malnutrition for the surveyed population of 107. There was no supplemental feeding program supporting these children. Comparative data are unavailable for barangay Cambinocot and Tagba-o. In 1998, Cambinocot had a low incidence of malnutrition with just 10 cases from 271 surveyed children aged 0-6 years old. Tagba-o was more critical with 29 cases from its surveyed population of 219.

Table n° 10.17 – Nutritional status of children 0-6 years old, peri-urban, Cebu City, 1987

Barangay	No. of children 0-6 years	No. of children weighed	No. of 1 st degree malnourished	No. of 2nd degree malnourished	No. of 3rd degree malnourished	Total malnourished children	Total children weighed
Cambinocot	333	0	0	0	0	0	0
Agsungot	279	202	94	13	0	107	72.4 %
Tagba-o	169	0	0	0	0	0	0
Sudlon I	391	0	27	15	0	42	0

Source: City of Cebu, 1987

A further study in the peri-urban villages was carried out by the OPS, the University of San Carlos (Cebu City) and the DENR (1999). They found that 12.6 percent of 6,400 school children were either severely or moderately stunted. This corresponded with a study (Fifth National Nutrition Survey) the previous year that reported 8.7 percent for the province as a whole. Similarly, 12.8 percent of the same school children were severely or moderately underweight versus only 5.5 percent for the entire province i.e. the peri-urban barangay appear to have a substantially higher incidence of underweight children.

These time-based studies of malnutrition status are fraught with difficulties. Climatic conditions and concomitant agricultural production cycles are critical when assessing nutritional status. The conditions during these two study periods were 'normal' in that neither drought nor flood had recently impacted the area. All we can

conclude from the available data is that malnutrition is an issue. Anecdotal evidence suggests that it can intensify especially during periods of drought that do reoccur from time to time.

10.14 - Allocation of land held by the State

It is important at this point to outline some of the salient points regarding land owned by the State that is occupied by farmers. This is a critical issue in Cebu but as mentioned in Chapter Seven this was also important in Sta. Paz.

The National Integrated Protected Area System (hereafter NIPAS), is the ‘umbrella’ legislation pertaining to environmental protection in the Philippines. The DENR began implementing the NIPAS Act in 1993, although it originated in 1988, when the Haribon Foundation of the Philippines proposed an “Integrated Protected Areas System” to then President Aquino. The act, formally enacted in 1992 as the Republic Act (RA) 7586, refers to the classification and administration of all designated protected areas throughout the Philippines. It is designed to maintain essential ecological processes and life-support systems, to preserve genetic diversity, to ensure sustainable use of resources, and to maintain the protected areas’ natural conditions to the greatest extent possible (PSDN 1999). The system was designed to halt the depletion of forest and marine resources throughout the country, and aims to secure for present and future generations of Filipinos the continued existence of native flora, fauna, and landscapes. It also strives to provide the basic human needs that are dependent on a healthy environment (Arquiza 1993).

The initial phase of the NIPAS project was the identification of ten priority sites to be protected, based on information from the DENR, conservation groups and the academe. This phase began in 1990, and was funded by the World Bank, as was the next seven-year implementation phase (Arquiza 1993). This funding was crucial to the program, as it has been a lack of funds, among other local issues, that has led to the degradation of the Philippines’ protected areas.

The NIPAS program is one of the major implementing strategies for Republic Act 7586, with the first five years of implementation financed by the European Union with increasing contribution from the Philippine government. The objective of the program is to achieve the following goals for each protected area:

- establishment of a Geographic Information System and integrated database;
- execution of socio-economic surveys and consultations;
- preparation of a General Management Plan;
- delineation and demarcation of protected area and buffer zone boundaries and strengthening the capability of protected areas management staff;
- promotion of locally identified alternative economic activities;
- enhancement of the effectiveness and sustainability of the protected area management and consultation mechanisms foreseen in the NIPAS Act, through the provision of appropriated training and advice of all levels;
- implementation of a public awareness program; and,
- provision of the necessary facilities and technical input (DENR 1999).

DENR personnel are responsible for these activities. The DENR is mandated to be the primary government agency responsible for the conservation, management, development and proper use of the country's environmental and natural resources (DENR 1999).

Groombridge (1992) notes that the primary objectives of national parks in the Philippines (there are two in the peri-urban environment of Cebu) are to maintain sample ecosystems in their natural state, preserve ecological diversity through environmental regulation, to conserve genetic resources and maintain watershed/flood control, to provide recreation and tourism service, to protect scenic beauty, and to contribute to rural development. Generally, natural resource exploitation is prohibited in national parks, meaning that agricultural and pastoral activities, hunting, fishing, lumbering, mining, public works construction, and residential, commercial or industrial occupation are all disallowed (IUCN 1985).

By contrast, and significantly, the primary objectives of other protected area designations under the NIPAS Act are unclear, particularly in the context of the role of local populations. Such ambiguity in the stated objectives is pertinent to the areas considered here. It is clear from the focus group interviews that there is contrasting and contradictory information permeating the peri-urban communities of Cebu and, until a clear message is forthcoming from government, continued distrust and lack of progress will define relationships.

10.15 - Summary

What is evident from the case study in peri-urban Cebu is the complexity of the relationships between those occupying land, those owning land and the various government agencies that are trying with limited will and ability to influence the direction of change. There is in contrast to Sta. Paz in Matalom a strong sense of urgency in 'solving' the tenancy and subsequently the environmental problems in the upland peri-urban environments of Cebu. This is largely owing to the hydrological relationship these peri-urban environments have with the rapidly growing urban economy of Cebu City with corresponding high population growth rates in the peri-urban uplands of the City (Flieger and Cusi 1998). What is not readily apparent is a coherent vision of how to attain sustainable tenure conditions and a still hypothetical concomitant ecological renaissance. Movement on this issue is just beginning to take hold through a comprehensive project initiated by many concerned government and NGO partners with a coordinating role being played by the Water Resources Center of the University of San Carlos.

Chapter 11: Population Dynamics, Land Tenure and Change

11.1 - Introduction

The analysis of the macro, meso and micro relationships between population dynamics, land tenure and food security in the previous chapters has shed light on the various realistic possibilities for change in the current system. In the light of the historical relationship between land tenure and the State the following scenarios are presented that may either provide long or short-term relief from the problems associated with lack of tenure security, small production units and unsustainable agricultural practices. The role of population in these scenarios is paramount. We have argued thus far that population mobility is largely a reflection of the lack of tenure security, involution in agricultural productivity as it relates to population and food security. The scenarios presented in various ways reflect these findings. We first begin by presenting an overall impression of agricultural labor force participation in the study barangay. We then discuss possible scenarios of change, potential consequences of change and potential constraints to change being implemented.

11.2 - Agricultural labor force participation

The participation of the case study population in agricultural activities is described in this report by means of an index devised by Collomb (Appendix 1). The index takes into account the following as described briefly in Chapter Two:

- whether the household head is a man or a woman;
- whether the household head works or does not work in agriculture;
- the number and sex of household members working in agriculture;
- the number, sex and age of household members not in agriculture but are in (or not in) the labor force;
- presence of children (under 15 years of age) in the household; and,
- presence of old people (65 years and over) in the household.

It is worthwhile discussing the distribution of sample households in the four case study areas according to the classification of whether the household is headed by a man or a woman and whether this man or woman is working in agriculture or not (i.e., the first number of the index).

Table n° 11.1 shows that in the case study areas most households are headed by men who are employed in agriculture. In peri-urban Cebu, for example, seven or eight out of every ten households are headed by men working in agriculture. Aagsungot appears to be an exception in that at least a third of the households have male heads who work outside of agriculture. As data elsewhere show this is a barangay in which the majority of the households draw a considerable fraction of their income from wage employment.

In Leyte, on the other hand, Boroc stands out as a barangay that is almost universally headed by male farmers (92.0 percent). Of the three case study areas in Leyte, Sta. Paz has the biggest fraction of households with male heads who do not work in agriculture (17.0 percent). Female heads of households are a minority in the Philippines, especially in agricultural areas. However, if women do become household heads in these areas, they are also likely to be working in agriculture.

The next *two* numbers in the index refer to the number, sex composition and economic activity of household members, as well as to the presence of children and people aged 65 and over in the household. These two numbers range from 01 (i.e., no person in the household aged 15 or over engaged in agriculture) to 57 (i.e., more than two people aged 15 or over engaged in agriculture among whom there is at least one woman or only men, and without children or persons aged 65 and over in the household) (See Appendix 1 for description of the 57 categories). From the succeeding tables it is demonstrated that of these 57 categories, only 29 are applicable in the case study areas.

Table n° 11.1 – Relationship of head of household to agriculture

CASE STUDY AREA	Male head in agriculture (1)	Male head not in Agriculture (2)	Female head in agriculture (3)	Female head not in agriculture (4)	No. of households (N)
PERI-URBAN CEBU (all four barangay)	187 (71.4)	50 (19.1)	17 (6.5)	8 (3.0)	262 (100.0)
Agsungot	37 (53.6)	25 (36.2)	3 (4.4)	4 (5.8)	69 (100.0)
Cambinocot	59 (68.6)	16 (18.6)	7 (8.1)	4 (4.7)	86 (100.0)
Sudlon 1	43 (82.7)	4 (7.7)	5 (9.6)	- -	52 (100.0)
Tagba-o	48 (87.3)	5 (9.1)	2 (3.6)	- -	55 (100.0)
LEYTE					
Sta Paz, Matalom	36 (76.6)	8 (17.0)	1 (2.1)	2 (4.3)	47 (100.0)
San Isidro, Baybay	42 (89.4)	2 (4.3)	2 (4.3)	1 (2.0)	47 (100.0)
Boroc, Ormoc City	46 (92.0)	- -	4 (8.0)	- -	50 (100)

Sources: OPS/USC/DENR 1999 Sample Survey, VISCA/LSU Sample Survey.

11.3 - The case of peri-urban Cebu

Peri-urban Cebu is primarily an upland agricultural area. Corn is the dominant grain crop with vegetables, fruits and flowers providing supplemental cash income for the families. The vast majority of farmers are tenants and/or lack ownership of the land they are tilling.

There is some variability across the four peri-urban villages we studied. For barangay Agsungot, of the 69 households included in the sample 21 did not have a person aged 15 or over engaged in agriculture. The next largest category was 14 households with two

persons aged 15 or over engaged in agriculture, with one or more children and no one aged 65 or greater in the household. For the village of Cambinocot 18 of 86 families were without someone aged 15 or older engaged in agriculture—a significant smaller ratio than was the case in Agsungot. The dominant characteristics of those households engaged in agriculture were the same as Agsungot. A third category with 11 households was defined by having only one person aged 15 or over engaged in agriculture who was a man, and with one women 15 or over not in the labor force and at least one child in the family and no one over 65 in the household.

In Barangay Sudlon 1 only four households did not have a person 15 years of age or older engaged in agriculture (of a sample of 52 households). 13 of 52 households were like barangay Cambinocot with only one aged 15 or over engaged in agriculture who was a man, and with one women 15 or over not in the labor force and at least one child in the family and no one over 65 in the household. The next largest category was 10 households with two persons aged 15 or over engaged in agriculture who were either a man and women or two men with one or more children and no one over age 65 in the household. The final peri-urban study site Tagbato had only five of 55 households without someone aged 15 or over engaged in agriculture. The highest category, with 16 households, had two persons aged 15 or over engaged in agriculture who were either a man and women or two men with one or more children and no one over age 65 in the household. A second important category that was dissimilar to the other barangay had 11 representative households with more than two people aged over 15 engaged in agriculture amongst whom there was at least one woman or only men with one or more children and no one over aged 65. In peri-urban Cebu (specifically Cambinocot and Sudlon 1), another common pattern is that of a household with a male head working in agriculture and a female member 15 years old and over (possibly the wife of the head) who is not in the labor force; there is at least one child under 15 years old in the household but no person 65 years old and over (Category 19). Also in peri-urban Cebu (specifically Agsungot and Cambinocot) a common variant of Category 19 would be that the female member 15 years old and over (or wife of the household head) is in the labor force but working outside of agriculture (Category 15).

The age structure for the peri-urban environment is of interest. The population is young with average median age across the villages of 18.5 years. Given the already critically low productivity of the area, the small farm size, the degrading landuse system based on corn and a high chemical dependency in the cultivation of higher value-added crops (like mango, vegetables and cut flowers) the future appears grim. The tenure situation is arguably the most complex in the country. There are overlapping jurisdictions and government gridlock in managing the crisis. Compounding the problem is the fact that many of the people residing in the peri-urban environment have no legal basis for claiming their land. The entire area is a critical watershed which supplies the majority of the water for the built up urban area of adjacent Cebu City. Still, as discussed above, the population is largely engaged in agriculture. With deeper examination, however, it is apparent that the older generation and men are typically engaged in this agriculture while the young women migrate for urban-based employment.

11.4 Leyte's study sites

As the following tables show, the characteristics of the villages in Leyte do not differ greatly from those in peri-urban Cebu in terms of the relationship of the head to the agricultural household (Tables n° 11.2; n° 11.3 and n° 11.4). If the household head, male or female, is not in the agricultural work force, chances are that no other person aged 15 and over in the household is engaged in agriculture (Category 1). Moreover, the predominant pattern of agricultural labor force participation in the case of Leyte's study areas is one in which the household head is a man who works in agriculture assisted by another household member (15 years old and over) who may be a man or a woman (most likely the wife of the household head) and who has at least one child under 15 years old but no elderly person aged 65 and over living in the household (Category 39). It is also quite common for there to be a variant of Category 39 wherein the male household head who works in agriculture is aided by at least two other household members in the agricultural workforce (possibly his wife and/or children); the household has at least one child under 15 years of age but no person aged 65 and over (Category 55).

In Leyte (particularly San Isidro and Sta. Paz), there are several households in which the male head is working in agriculture assisted by one other household member, man or woman (possibly his wife), but with no child or elderly person living in the household (Category 41).

Table n° 11.2 – Barangay Sta. Paz, Matalom, Leyte

CATEGORY	Male head in agriculture (1)	Male head not in agriculture (2)	Female head in agriculture (3)	Female head not in agriculture (4)	No. of households (N)
1	-	7	-	2	9
19	2	-	-	-	2
20	1	1	-	-	2
38	2	-	-	-	2
39	15	-	-	-	15
40	4	-	1	-	5
41	8	-	-	-	8
55	1	-	-	-	1
56	2	-	-	-	2
57	1	-	-	-	1
Total	36	8	1	2	47

Table n° 11.3 – Barangay San Isidro, Baybay, Leyte

CATEGORY	Male head in agriculture (1)	Male head not in agriculture (2)	Female head in agriculture (3)	Female head not in agriculture (4)	No. of households (N)
1	-	1	-	1	2
9	-	-	1	-	1
19	2	-	-	-	2
20	-	1	-	-	1
21	2	-	-	-	2
39	11	-	-	-	11
40	4	-	-	-	4
41	10	-	1	-	11
55	7	-	-	-	7
56	2	-	-	-	2
57	4	-	-	-	4
Total	42	2	2	1	47

Table n° 11.4 – Barangay Boroc, Ormoc City, Leyte

CATEGORY	Male head in agriculture (1)	Male head not in agriculture (2)	Female head in agriculture (3)	Female head not in agriculture (4)	No. of households (N)
23	1	-	-	-	1
38	2	-	-	-	2
39	17	-	3	-	20
41	2	-	-	-	2
51	-	-	1	-	1
54	1	-	-	-	1
55	15	-	-	-	15
56	3	-	-	-	3
57	5	-	-	-	5
Total	46	-	4	-	50

11.5 Recommendations for Change

11.5.1 - Peri-Urban Cebu

Based on the FGDs and the complexity of the land tenure system in peri-urban Cebu what is recommended is that farmers and tenants obtain greater security in occupation of the land they are currently cultivating and occupying. A provision does exist in the law for allocating such complex lands (within Parks, critical watersheds) as CSC. These contracts have well defined rules. One is that they are for a fixed term of 25 years with the possibility of renewal for a further 25 years. The farmer can not expand the area under contract at any time. Moreover, the farmer is encouraged to incorporate agroforestry technologies on the contracted land. In this particular case it would also be wise to include a clause in the contract that restricts the transfer of the contract to family members so as to avoid the accumulation of lands through the buying out of contracts by powerful and influential persons. The size of the parcels

claimed under such a system would be highly variable and the potential for the area to absorb large numbers of people would be very limited.

11.5.2 - The Upland Environment of Sta. Paz, Matalom, Leyte

For the marginal upland environment of San Isidro there is a greater distance to travel to reach some type of tenure security. At present share tenancy is common in spite of the fact that it is deemed illegal by the government of the Philippines. The sharing system generally used is based on one share of the crop staying with the tenant with three shares being delivered to the landlord. The first step in improving the situation would be to move to a share system ratio of one to two and the legal minimum situation in the Philippines which is a leasehold arrangement. Twenty-five percent of the average harvest of the three normal harvest seasons is the agreed payment from tenant to landlord under a leasehold arrangement. The final step in this process is the acquisition of full ownership of the leasehold land. This does not require any ongoing sharing of produce from the farm but does require the amortization of a loan. The complications of this change are highlighted later in this study. Under this system the land holdings of the current tenants would remain very much the same. With the gaining of full ownership the lands could then be sold and this has implications for future generations. The current trend of high out-migration and low growth rates would be expected to continue. The hope would be that as a greater share of the harvest is controlled by the tenant, household incomes would improve and the money invested in education of children would continue.

11.5.3 - The lowland rice environment of San Isidro, Baybay, Leyte

A priority in the tenure situation in the lowland rice environment would be the improvement in tenure security from tenant to leasehold and then to full ownership. This is similar to the situation in the uplands although it is our belief that the possible constraints on such a scenario would not be as daunting in the lowland agro-

ecosystem than in the upland case. A second possibility to improve farm productivity would be land consolidation, which is the removal of the current fragmentation with different parcels in different parts of the village being cultivated by one household. At present there is a national program supporting this initiative. A final possibility, given the low growth rates, low fertility and general better economic condition of farmers in this lowland environment (as compared to all others in this study) is the possibility of several farmers expanding their area under cultivation by renting adjacent farms from other tenants, leaseholders or owners. This would provide the latter with a guaranteed fixed income while the person or household expanding its holdings will be able to benefit from the economies of scale of lowland rice production such as the incorporation of technologies to improve yields and efficiency in production.

11.5.4 -The sugar cane plantation environment of Boroc, Ormoc City, Leyte

The plantation situation is distinctive. It is clear that land should be allocated more equitably than is presently occurring. Claimants have moved ahead of the DAR and have seized parcels of land within the old hacienda. The size of the seized parcels reflects the power and influence each household has in the community. What we advocate is a more systematic and egalitarian distribution of the lands. There are at least two scenarios for this to occur. One would allocate up to three hectares of land to each former worker on the plantation. Three hectares is the upper limit in terms of area that can be allocated under the current agrarian reform laws of the Philippines. In this case the couple who head the household can make a claim and then their adult children living with them can do the same. Former workers on the plantation can also claim up to three hectares for themselves. In theory, a household with a couple working on a plantation and with two adult children also working on the plantation can acquire up to 12 hectares of land. Given that population growth rates are high in this area and the families tend to be very young this greater area of land being allocated could be beneficial over the long term as the rate at which the farm would be broken down to smaller production units through inheritance would be slower than in the following case.

The second scenario we propose would limit the allocation of lands to just three hectares per household regardless of the number of household members engaged as workers on the former plantation. Under this scheme younger families with very young children would not be penalized in their potential allocation i.e. there would not be a generational and age bias in the allocation of lands.

11.6 - Legal changes in access to land

Present agrarian reform legislation allows certain reform mechanisms to retain production units by allowing beneficiaries to organize themselves into cooperatives so that the land is owned cooperatively and the cooperative gets a collective Certificate of Land Ownership Award. This option may prove to be problematic since many farmers are wary of cooperatives. Besides, the notion of cooperative farming contradicts the human motive of individualism and independence. Another option allowed by the law was for corporate farms to issue certificates of stocks to the workers so that they become co-owners of the farm. In this way, no physical break-up of the farm occurs. This is exemplified by Hacienda Luisita in Tarlac and the Del Monte Farms in Bukidnon. This arrangement has been criticized because of the perceived disadvantage of the beneficiaries as they get very low dividends.

11.6.1 - Access to land: the poor and malnourished

Currently, there are no special government programs that facilitate access to land for those who are either poor or malnourished. Historically, these people have been highly mobile, at least in the local situation. They were more likely to be 'late adopters' as squatters in the generally fragile upland environments, typically State-owned, which are so common throughout the interiors of the archipelago's islands. We say 'late adopters', as the first squatters into such areas were typically those who had economic and political power and who could 'overcome' any State resistance to their occupation of State land. After the way had been cleared by these 'early adopters' the 'middle' and 'late adopters' moved into the still more peripheral areas of State-owned land.

The poor have also been accommodated by the various land reform programs of the government. But the success of these programs while apparently good on paper fall well below their objectives when the reality of the village economy is taken into account. Tenants who are made owners and are amortizing the loans given to acquire the land they now cultivate (and which they once tenanted) with some frequency fall behind in the payments and then voluntarily re-establish the tenancy relationship with their former landlord for security. When times become difficult the relationship with a local 'benevolent' landlord is much preferred to that with the State.

The malnourished tend to be supported by and integrated into program devised by the local offices of Department and Health, Department of Education, and Department of Social Welfare and Development. As a result malnutrition is not a criterion that is used by government in its decisions on the allocation of land through agrarian reform or the official allocation of State-owned lands.

Access to land for women and the youth has recently changed. Women can now apply on behalf of the family unit to acquire land as part of the agrarian reform program. Young people can also apply to be beneficiaries of land but they must first be considered an independent household unit (not dependents of their parents).

The possibility for the State to allocate more of its land in the studied areas is minimal. Most state land in the studied areas is either already allocated under the stewardship contract program or is already squatted on by local farmers. It is important to keep in mind that in the future, the allocation of State land may be forbidden by law. A law currently being reviewed maintains that the allocation of state land for any purpose will, in the future, be completely unacceptable i.e. there will be a complete moratorium on the allocation of State-lands for any purpose.

11.6.2 - Sta. Paz, Matalom

The conditions in the uplands differ from those of the irrigated lowlands (see condition of the uplands above). The production risk in upland farming is very high. According to the farmers, there are cropping seasons when a farmer could not harvest anything from corn or upland rice. Corn is sensitive to too much rain and upland rice to long draught. Both crops are vulnerable to a number of pest and diseases including destruction by stray animals.

The systems of '*inupat*' (1:3) sharing is the current practice but farmers said they would be happy if the landowners will agree on the '*tinulo*' (1:2) sharing. But under their present circumstance they need the landowner's (patron) assistance to the family (cash, materials, personal favors) so they can not force the issue of giving them the more favorable sharing (*tinulo*) arrangement.

On the DAR records, however, the farmers are in leasehold arrangements because share tenancy is illegal under the CARP program. But adopting the leasehold tenurial contract is less preferred by the farmers than by the landowners. Fixing the rental of the land would be unrealistic for the farmers because of production uncertainties. Tenant's full ownership of the land they till applies only to five hectares of corn or rice land. However, we can also see the positive impact of the leasehold contract of fixing rentals. If given appropriate technical, financial support, and other services, upland farmers may be motivated to produce more.

11.7 - Potential effects of tenure change on agricultural productivity

In general, with improved tenure, the operator will have greater motivation to work, adopt more production technologies, implement permanent improvements in the farm and assume greater risks.

In San Isidro with its lowland irrigated agriculture, the incentive for moving from tenancy to leasehold is greater because

the operator gets a bigger share of the produce because the rent is fixed. Any further increase in productivity, therefore, will accrue only to them. In addition, the presence of irrigation reduces production risks and the farmer is able to adopt other production technologies. Productivity is expected to increase.

If the tenure can further be improved to full ownership the farmer may be able to shift to more high profit enterprises since rice as a crop, no matter how productive, cannot provide the basic needs of the farmers adequately given the small landholdings in the area. The present yield levels in San Isidro are already high and cannot be raised much higher. Therefore, an average landholding of 0.3 hectares under rice cannot provide enough income. The alternative is to convert the land to some high-value crops that do not depend on large farm size. This unilateral shift is not possible with leasehold or tenancy as decisions to change land use must be made in consultation with the landlord.

Furthermore, full ownership allows the farmer to have his landholding consolidated in operation by a cooperative of local farmers or a renter who will pay cash rent to operate the farm. The farmer can then shift to another job as he is freed from operating his own farm. Renters should be more productive in order to generate a profit.

Unfortunately, the best that can be legally done in San Isidro is leasehold. Leasehold is generally acceptable to tenants but generally not acceptable to landowners, especially small landowners because for small landholdings, the rent could really be small. It is suspected that on paper, leasehold had already been entered into between tillers and owners but the owners have begged, cajoled or coerced their former tenants not to stick to the leasehold contract in order to get better terms for themselves. Benevolent (*maayo*) owners may get these concessions easily or voluntarily from their tenants; politically influential owners may be able to coerce their tenants into agreeing to other terms and may even successfully eject tenants. A legal way is available for land owners by paying the tenant a 'disturbance fee' and the tenant loses all claims to the land. The other way is to buy out the tenant and make it appear that the land is not or has not been tenanted.

In plantation agriculture, carving up the land into small individual landholdings may temporarily result in lower productivity because of the inability or lack of skills, of former workers to manage their own farms after years of working only part of the farm operations and not knowing how the farm operates as a whole. Therefore, there is a need for any tenure improvement scheme, to be immediately accompanied by support packages such as farm management and technology training, provision of capital and farm business advice in order to spur productivity. There is even greater need for this in Boroc since the previous estate owners, characteristic of the rent-seeking behavior of many of their kind, did not implement land improvements and land conservation methods so that the fertility of the land has been considerably reduced. As the new owners become more proficient, productivity should increase in the long run.

Retaining the estate as a cooperative farm owned by the workers/beneficiaries is a theoretical option but it will probably lead to lower productivity because a larger farm would be even more difficult to manage and given the social problems associated with cooperatives, management will be equally if not more problematic. Seeking professional managers may lead to higher productivity but it may entail higher costs and members will be averse to any substantial investment in an already precarious venture (sugar cane production). Besides, the cooperative will be hard put in looking for good managers and getting the money to pay them.

The new land owners, however, prefer individual ownership. First, they resent the fact that under the hacienda, they were controlled (*kinaptan*) by their masters (*agalon*) implying control in many aspects of their lives especially in economics and politics. Second, they want to make their own decisions on what to do with their farms. Third, they are aware that not everybody is going to work hard and they did not want a cooperative because others would be '*magsalig*' (free loaders). That's why they said that even with their own land now, there will always be those who will make good and those who will not because there are lazy people and hard working people. The landowners have always resisted any moves to take the land away from them. But given their inefficiencies and the

right price, they have shown willingness to part with their landholdings. The community at large will support any move to break up the hacienda.

In the upland and highly unproductive area of Matalom, changing from tenancy to leasehold may not lead to higher productivity because the risks are greater for the lessee given the high unpredictability of success. Fixed rents may, in fact, be a disincentive in highly unpredictable systems such as Matalom. Both tenants and landowners may not like the move to leasehold.

Full ownership may provide a greater incentive to be productive. In environments where greater investments for conservation technologies are required in terms of money, effort and time, the farmer has to have greater assurance that his investments accrue only to him or her or else they may not be willing to invest. For example, some land conserving practices involve considerable disturbance to short term production. A farmer may be willing to wait for this sort of investment to bear fruit if he or she owns the land, a wait he or she could not afford under leasehold arrangements.

In the peri-urban situation where legal and practical constraints limit land use, productivity may still increase with tenure improvement along with a shift from the traditional crop—corn. Increases in productivity under such very socially and physically constrained conditions will come largely from technological rather than tenure improvements. The tenants will accept any tenure improvement but the city and other urban constituents may resist any move to legitimize the tenure of upland area occupants because of the importance of the area to the city both as a source of water and as a nature reserve.

11.8 – Consequences of changes in the land tenure system

Change whether it is in a farming system, a market, or in this case a land tenure system, will evoke different responses from different sectors of society. Arguably, in the rural Philippines change in the system of land tenure is one of the most highly-charged issues and one which brings out both the best and worst in people and society.

The proposals we have put forward for adapting the land tenure system to population dynamics of the countryside are modest. This modesty may stem from our lengthy experience with the reality of land tenure reform in the Philippines, a cumulative experience of nearly a century. Historically, and in our experience, reform has borne very little fruit. In fact, what is clearly one of the most conservative recommendations is to simply implement the current agrarian reform program to the letter of the law without political and judicial interference and with appropriate levels of funding and technical support. This would require not just land reform but agrarian reform, whereby the entire rural food production, processing and marketing, and credit systems would be reviewed and overhauled in a manner that would support the system of land allocation put into place in the villages. What follows are examples of how change in land tenure systems might affect local economies, namely the villages studied in this book. We are primarily interested in considering the consequences of proposed changes in the land tenure system to society and the environment, and hence the risk to current and future food production and food security.

11.8.1 - The situation in the case study sites

In the upland environment of Matalom if farmers secured different and less onerous share-cropping ratios with land owners there would be positive consequences for family incomes. However, with the more secure leasehold system the amount of rent is fixed and this is payable whether a crop is harvested or not and this can be highly stressful to the families farming the marginal upland environments where the loss of crop to drought, flood and/or pestilence is more common than in the lowland, irrigated environments. Therefore we accede that tenure reform in this type of environment needs to leapfrog the leasehold stage and go from sharecropping (with its concomitant patron-client safety net) to a full ownership system whereby former tenants have secure ownership of the land and can access capital from a wider array of commercial sources. A caveat in this is the fact that full ownership is not legal in many upland areas as the land the farmers are occupying is State-owned land and it cannot be held in full ownership. The *de facto*

situation, however, means that some persons claim the land and have tenants working the land.

A further consequence of land tenure reform is that intensification would be expected to occur if land ownership was secured. However, given the marginal nature of the environments, this would not produce enough food to support the families already living in the area. This issue is even more critical where upland population growth rates are high. A further consequence of this limit in productivity is the widespread out-migration of women to urban areas. This out-migration must continue if environmental sustainability is to be achieved in the upland environments. We do however recognize one very serious long-term consequence of youth out-migration and that is the lack of successional farmers to replace the currently aging cohort of Filipino agriculturalists. Farming is already shunned by the youth and the consequences, while not readily apparent at this stage, are beginning to appear in some upland environments. In parts of upland Leyte, farmers are abandoning their marginal upland holdings and moving to adjacent lowland areas where they are seeking alternative livelihoods (usually value-adding activities). The consequences of this to the environment are obvious—it should regenerate and improve. However, the uplands are also an important source of food and fiber for many families and the loss of this productivity will need to be made up from either increased productivity in the lowlands or importation of food.

Intensification has a downside in that productivity may increase but inputs will also increase, as will expenses and non-point source pollution, demand for opening of new lands, or shorter fallows.

The uplands, we argue, are near the maximum or have already exceeded their sustainable carrying capacity given the current set of socio-economic and technological constraints. Certainly widespread terracing, for example, could be introduced into the farming system but the capital and labor to institute such a program is lacking or too expensive to be considered viable. Commodity prices would need to rise considerably before widespread technological intervention would be viable. In fact, at

this point in time, even without factoring in the rising population pressure on the land, some level of intensification is already occurring, just to keep pace with the declining capacity of the land to produce. This is often seen with the shortening and in some cases elimination of fallow cycles that are critical to the regeneration of the soil environment for continued production. A consequence of this type of intensification is the potential for a complete collapse in the capacity of the land to produce, and the resulting forced migration of the family off the land.

Many of the ideas presented for the upland environment transcend to the lowland, peri-urban and plantation situations. A further point that must be considered in the lowlands is the very small average farm size of just 0.3 hectares. This small farm size is common in the lowland rice growing areas of the Philippines. We argue that even with land reform and full ownership being extended to tenants the farm is not viable as a self-contained household supporting unit. It is far from being viable as the production from such a farm, even with the use of the latest technologies, will only provide the family with a few months supply of rice for home consumption. Therefore, off farm income is critical to the household's subsistence. This issue transcends all the case studies. Regardless of the land tenure reforms put into place, the farming households must gain substantial non-farm income in order to survive. This may come from alternative livelihood strategies locally or may be derived from remittances from urban-based family members, or in some cases family members working overseas. At present one million Filipinos are registered overseas workers.

The peri-urban environment of Cebu, as we have repeatedly noted, is very complex tenurially and in terms of the production systems. The proposed allocation of Social Forestry Contracts would be in many ways beneficial in that the carrying capacity of the land would be improved at the same time as the environment. This would be the case, as the cornerstone of the social forestry contract is agro-forestry. It would fit in well with the current system as many, if not all farmers, currently supplement their income with off-farm employment (which permits them to buy food). The consequence of these contracts being made non-transferable to anyone other than a family member will curtail the encroachment of

urban activities into the critical upland environment. This is one of the most contentious issues in the area and would meet stiff resistance from business-oriented persons. The other alternative, which is the removal of the people from the critical watershed, is not politically viable. It is no exaggeration to say that the result would be armed conflict.

The situation in Boroc is also complex. This is one area that has not reached its carrying capacity as more of the former plantation is programmed for allocation through the laws of agrarian reform. Productivity increases look set to occur as farmers gain secure title to land. The main consequence of these changes is the pace of government intervention in this area programmed for agrarian reform. The former workers are seizing land prior to official government allocation being made. Therefore, old power structures are being re-established and this could have a negative impact on the success of the tenure reform.

11.9 - Constraints to reform

The impossibility of adapting certain land tenure systems may be caused by several factors. We have arranged them into different sectoral interests starting with government which could be the key facilitator or hindrance to changing the current situation. The government intersects with cultural issues, the nature of the resource base, and population dynamics.

11.9.1 - Government

The Philippine government lacks political will to implement real agrarian reform. The role of agrarian reform is some kind of an appeasement program designed to placate a restless peasantry but not radical enough to antagonize the landed oligarchy which dominates local politics. It follows that legislation that governs (and has governed) agrarian reform is formulated by a landowner-dominated legislature which protects its own interests. The law has too many loopholes and allows landowners to evade reform. The coverage of large estates, for example, has been hampered by the ability of landowners to legally evade the law—converting it into

some enterprise not covered by land reform, or to ask for deferment of coverage of their properties thus to allow enough time for the basic law to be amended so as to exempt them from coverage.

Congress can further disable the implementation of agrarian reform through its allocation function. It can decide to cut off money for agrarian reform should its direction displease its landowning majority. By the late 1990s, it was alleged that agrarian reform was slowing down because of the lack of a budget to carry out its full mandate. At that time, there were moves by the vocal landlord block in Congress to amend the law. Furthermore, Congress can remove officials too eager or too radical for its taste and this happened to a former Secretary who was perceived to be too pro-farmer.

The judiciary is not much help since land owners can afford to hire lawyers who have used the court to challenge the law. Land owners may use private guards to prevent the installation of farmer beneficiaries, stop entry even of government personnel into their estates, refuse land valuations and amortizations, take back their land, cause farmer evictions, and, even file cases against bureaucrats who they could not threaten or manipulate. A landmark ruling (The Pedro Yap Estate case) was issued by the Supreme Court on land valuation and the ability of landowners to reject and regain possession of their land. This stalled the agrarian reform process and emboldened many landowners to use the ruling to evade the law.

One way to encourage big landowners to dispossess themselves of their holdings is taxation. By levying higher taxes as landholdings increase and by penalizing those who keep larger holdings idle will discourage speculators. Taxation has encouraged the possession of large estates even if left idle because the tax levied on large landholdings is low. Furthermore, the government revenue bureau faces governance problems so that tax payments can further be reduced through compromise deals between taxpayers and tax collectors.

11.9.2 - Culture

Filipino culture places a premium on land ownership. Urban dwellers still want to have land even if they did not want to farm it.

Inheritance practice and the law require equal partition of assets. Therefore, land must be subdivided among heirs thereby continuing the endless process of fragmentation as generations hand down their possessions to their successors. This leads to uneconomical farm sizes. This is related to the concept of land being an asset, that must be divided up and not as a means of production that must be left undivided at some point in order to retain its viability as an economic unit.

In the break-up of the landlord tenant relationship under reform, the traditional patron-client relationship is also broken. Traditionally, the patron is seen not just as a landowner. He also provides other forms of 'fathering' functions. It is difficult to sever this relationship leading to an inability of tenants to go against their patrons for fear of reprisals. They may also feel a deep sense of '*utang na loob*' (gratitude). This is one reason why lessees in small holdings refuse to pay rent and stick to the old sharing system.

In terms of cooperativizing agrarian reform beneficiaries both from small and large landholdings, the concept has not progressed because cooperatives have generally been a failure. The explanation is cultural. People do not believe cooperatives would work because the obligations and rights could not be imposed because of '*hiya*', (shame) '*tayo-tayo*' (old boys network), '*kamag-anak*' (kinship) and many other cultural features of Philippine society.

11.9.3 - Resource base

In many resource poor areas, tenure improvement may be negated by the severe environmental limitations of the land. Land degradation may constrain the beneficiaries from paying amortizations because yields would be too low and production highly unpredictable. Fixed rentals under such conditions are highly

disadvantageous and tenants themselves may resist such a solution.

Government-owned lands, the mainstay of the agrarian reform bureaucracy, are mostly located in critical areas, with fragile environments. Continuously opening up areas for reform will result in severe destruction of the remaining critical watersheds, forest reserves and wildlife habitats/sanctuaries.

11.9.4 - Population

Sheer population size and growth in rural areas will severely constrain the gains of any agrarian reform measure. The land at present is already severely over-exploited and too fragmented. Redistribution of these lands into tiny individually operated farms will reach a point where farming becomes no more than backyard gardening, unable to provide a decent life to the farmer, and unable to produce significant volumes for the market.

Rapid urbanization has also caused rapid conversion of prime agricultural lands into non-agricultural uses thus reducing the size of farms and/or displacing farmers.

For a number of reasons the continued prevalence of out-migration as an adaptation strategy must also undermine attempts at reform. The safety valve of migration reduces the stress on the rural land tenure regime and social infrastructure while admittedly intensifying the stress in urban areas which receive the migrants.

11.9.5 - Socio-economic

Stakeholder participation in planning and management of the agricultural ecosystems is lacking. The farm sector has practically no political power to influence Congress or any legislative bodies on changing the life for small-holder farmers. Farmers are organized but the organizations are too weak to stand by themselves as there is limited support given to farmers' organizations. It cannot even lobby for local interventions/assistance. The energies of the farming population are not harnessed to create sustainable landuse systems. Farmers and the government have no functional political

relationship. In other words, farmers are not empowered to negotiate welfare with the government. Farmers' activism is fragmented. Farmers lack economic incentives and support for sustainable agriculture. The rural areas lack non-farm employment for small farmers and for the landless farm workers. Moreover, the rural areas lag behind in education and suffer from a generally poor health status. These factors must interact with the other issues of lack of participation in civil society geared toward positive social change.

11.9.6 - Technological

To make farming profitable, farming technologies must cover the technical solutions to farmers' problems and the support services required to make the technology effective. In reality, there are no clear mechanisms for government institutions and the private sector to employ in order to deliver the policy and varied technical and infrastructural support to facilitate small farmers' development. Most technologies are designed for the lowland farming systems and large commercial or plantation types of agriculture. For instance, the upland cropping systems are the same as those employed centuries ago, i.e. using traditional cultivars, cultural management and cultivation practices. In general, there is an absence of people-oriented upland farming programs.

11.10 - Changing the tenure regimes

Proposed changes in tenure regimes must be acceptable to local communities and their leading citizens if they are to have positive results. Thus government authorities and, in particular in the Philippines, the DAR reform (in the case of State-owned lands) the DENR must be aware of community attitudes. Equally the social and economic repercussions that may result from proposed changes need early assessments.

11.10.1 – Upland, Matalom

Matalom is representative of the situation of a large number of peasant farmers occupying the interior uplands of the Philippines

many islands. In this area agrarian reform took place with some lands allocated to small scale farmers under the amortization scheme of the DAR. Under this scheme compensation is paid to the former owner (landlord) through payments received from the former tenant. A price is agreed to for the land through a complex mechanism of averaging local land sale prices and negotiation with the landlord. When an agreed price is found the tenant then becomes the owner of the land and he or she amortizes the loan over a fixed period of time (also negotiated). The system has worked very poorly. In Matalom, as in other upland areas of the Philippines, the landlord—tenant relationships were long standing and durable. There was an understanding between the two. With the imposition of agrarian reform the earlier ties were broken and the social relationship that had previously occurred was replaced with a monetary relationship.

Over time and with the vagaries of weather and pestilence the new amortizing owner would inevitably miss one or more harvests or have poor harvests. Under the rules of agrarian reform the new owner still had to amortize the loan (harvest or no harvest). In many cases this became a burden to the new land owner and within a few years the new owner would return the land to the former landlord and renew the tenancy, and the relationship that they had before. In effect, the system of agrarian reform did provide land to the tillers but the policy neglected to include the social safety net(s) that were provided by the former landlord-tenant relationship. For example, if children of the tenant became ill that tenant could rely on a landlord for some sort of financial support to assist over the short term. There were other intangible benefits of being a landlord and a tenant that the government failed to recognize. In the end many of the initial results (reported to central government) of the agrarian reform initiatives did not materialize over the long-term. Therefore, in the government records there will be a report stating the success of agrarian reform in the uplands of Matalom but the reality of the situation is very different. In this case the landlord benefits by getting their land back and the tenant benefits by regaining a modicum of social security (and harmony in the village).

11.10.2 – Lowland, Baybay

The case of San Isidro is determined largely by government policy. All the different sectors of society reported that they would respect whatever policy the government chose to implement in their particular area. The practice of accepting government policy and its implementation in the first instance and then returning to personal relationships after the government has gone is also commonplace in this area (as in Matalom).

11.10.3 - Plantation, Ormoc

In the former sugar estate the preferred pattern of land ownership is individual parcels. It is the allocation of parcels that is contentious as the people have moved more quickly than the DAR and have in effect seized land in advance of an orderly allocation. In this case the more powerful in local society have claimed more land than the weak and poorly connected. Clearly, the more affluent and politically connected people in the village are benefiting from this system.

However the longer term implications may not be beneficial as social conflict could arise. The large landowners who once owned the hacienda certainly disagree with the policy of land redistribution and they have threatened violence. The matter is still in the courts as an appropriate amortization price is agreed to. It is likely that a price will not be agreed to and the land will be returned to the former hacienda owner. The question will then become one of what to do with the former workers who have already begun cultivating the land for themselves.

11.10.4 - Peri-urban, Cebu

The complex situation in the peri-urban environment of Cebu has the local population, local government agencies and national agencies stymied. There is a complex mix of interest groups from large and powerful family interests with eyes on the land for commercial developments, high end residential development and

things such as golf courses, while at the other end of the spectrum there are growing numbers of poor families attempting to eke out a living on State-owned lands that are also within the nearby city's critical watershed for potable water. The more affluent, and those with political connections, are able to secure title to lands that should, by the laws of the Philippines, be held by the State, not in private ownership. Meanwhile the peasant farmers are completely insecure in their relationship to the land with rumors abounding on the next policy to be adopted by a government agency to shift them or formalize their tenure relationships. It is beyond the scope of this book to fully explore the complexities of this situation and the politics at play. It is a potentially explosive situation both economically and politically and one which requires very careful handling.

11.11 - Overall Impressions

What is very apparent from these case studies is that land tenure relations are local affairs. While the government may impose policy from the top, in this case from distant Manila, these policies are mediated locally and thus are hybridized by local power politics and land tenure histories. As we discuss in the final chapter, one form of adaptation to this complexity may be to embrace it and indeed make land tenure reform a local issue rather than one that is managed, effectively from Manila.

Chapter 12: A Synthesis of Findings and Prospects for the Future

12.1 - Introduction

This final chapter is a synthesis of the work carried out during the four stages of this project as defined by Collomb (1998). The first stage highlighted the current situation in reference to land tenure and the degree to which the various manifestation of tenure are adapted to the population structures and dynamics at the macro or national level as discussed in Chapters Two and Three.

The second section of the book was more condensed and pertained to the designation of study areas in which to address the themes explored nationally at a meso village level and micro household level. Definitions of the type of data required at the meso and micro level were defined by Collomb but not the methods required to collect nor analyze the information, with the exception of the index for cross-comparison with other nations.

The third stage of the book delved into the analysis of similar themes to stage one but at a much more detailed village level where the interactions of the variables became more apparent and more easily disaggregated and articulated. The third stage also incorporated special topics such as the impact of malnutrition and the issue of access to land for the youth and women in society and was addressed in detail in Chapters Seven through Ten.

The fourth and final stage of the book, is based on the findings of the second and third stage and explores the acceptability of potential changes in the land tenure system and their likely effects on the local population, and also the acceptability of the changes to the local population. This was discussed in the penultimate chapter and leads logically to this concluding chapter whereby we address the questions posed in the introduction in light of the findings at the macro, meso and micro levels.

In writing this final chapter we adopt a case by case method, whereby different scenarios are introduced and the likely

interrelationships between land tenure, food security and demographic change are addressed for the Philippine case. This is then followed by a section reviewing the policy implications of the findings and where future research may be most fruitful in this important transdisciplinary field.

12.2 - What constraints are preventing an increase in agricultural productivity?

There is an on-going debate between the role of population growth, related land inheritance patterns and unsustainable exploitation of natural resources that then leads to land degradation. In the case of the areas studied, population growth is continuing at a modest to high rate. In all the systems studied degradation of the environment has and continues to occur in one form or another. In the sloping and marginal uplands of Leyte and the similar environments of peri-urban Cebu land degradation is more apparent in that soils have been eroded over many years and production is exceptionally low (by national standards). In the case of the two lowland systems degradation is primarily evident in the level of soil demineralization stemming from the overuse of inorganic fertilizer. Soil erosion is not a major problem but the lowland soil's capacity to hold moisture and its natural fertility and soil biological organisms are extremely impoverished. The link between population growth and this level of degradation is weak. In many cases the degradation was initiated many generations ago and followed the initial opening-up of the land. Population growth rates are in part, implicated as an underlying cause for new, fragile lands being opened for agriculture. However as our case studies have shown, the stronger link is with land tenure regimes and the inequality in access to land and other problems rooted in an ineffectual industrialization policy for the nation as a whole.

12.3 - Population growth prevents increasing yields and long term investments?

Investments in infrastructure and so-called landesque capital can have a positive impact on agricultural productivity by lessening the impacts of droughts and floods and longer term effects of things

such as soil erosion on sustained yields. In the Philippines, landesque capital, such that it is, has been largely invested in the country's wet lowlands at the expense of the majority of the country's other cultivated lands, such as the dry lowlands which are unsuited to rice, and the sloping uplands. This wet rice focus has in itself been fostered by those with a vested interest in the success of the lowlands. In part, this investment in lowland infrastructure is to be expected as the lowlands are typically held by persons with some security in tenure. It is in the uplands, with their very weak tenure security, that the greatest problems lie. Few if any farmers or tenants invest in longer term infrastructure work or remediation strategies to ameliorate the impacts of land degradation when they lack clear security in tenure. Even in cases where tenure is secure, the marginality of the land obviates the benefits in over investing in works to maintain soil fertility and productivity. Moreover, the opportunity to secure capital for such works is rare. Thus in this case population growth is less of an issue than land tenure security, and the latter is the main focus of current government programs.

12.4 - Is it the case that in low population density areas, away from urbanized areas, productivity is generally kept at modest levels, but with increasing population, agricultural intensification ensues to feed the increasing population?

The scenario outlined above does not pertain to the Philippines i.e. there is contradictory evidence. The land base in many areas that currently experiences (or in the past has experienced) population growth is often highly degraded and the potential to increase production with only modest improvements in infrastructure and technology is not perceived by the farming population. In the Philippines, the response under such situations is to invest not in the land but in human capital. Education is purchased, with a focus on women, so that a growing part of the rural, once agricultural dependent population can secure urban-based jobs and which require them to secure their sustenance from the marketplace rather than the farm. There is also a long seated inequality in land holding patterns and while population pressure rises there may actually be a disintensification of agriculture. This occurs if there are owners of large tracks of land who do not rely upon them for their principal income. In these cases, land can be taken out of grain production

and placed into a pasture system for cattle or other grazing animals. This strategy may avoid agrarian reform by removing tenants who could be cultivating the land and could lodge claims to the land. Similarly, land can be absentee-owned and intensification may not proceed at the necessary pace to keep up with population growth as incentives to increase yields are lacking. There is, however, a significant caveat to the latter situation. If a formal leasehold contract is signed between a landlord and tenant a fixed rent is agreed upon. Under these conditions any increase in production from either intensification or productivity gains will accrue directly to the tenant. While this may be the case, there are few examples where this is the motivating factor behind a tenant's increased productivity.

A final scenario in this section relates to land fragmentation and its links with population growth. In the Philippines there is a clear relationship between population growth and land fragmentation. Inheritance patterns are critical to this issue. All lands are, at least in theory, equally allocated to all siblings with the death of the parents. Population growth rates are thus a very real and serious concern in that a farm that in one generation was adequate to support a family can rapidly leave all the siblings with uneconomically-sized farms (in just one generation). This is managed in various ways in the Philippines. The most common adaptation is for family members to migrate either to the cities or overseas, thus reducing the pressure for production. Yet they maintain a tie with the land and still consider themselves to be owners of a share of the land. Typically, one or more family members remain on the farm to cultivate. In the Philippines this form of fragmentation has in many cases reached a terminal point, in that families recognize the inability of an inherited area to support another family and they adapt by ceding the land to a sibling and moving away. Therefore fragmentation, at least in terms of family farming units, is unlikely to proceed much further.

12.5 - To what extent do individuals engage in agricultural activities (in particular, heads of domestic production units, the young of working age and women)?

It is thought that rural production units experience a high degree of mobility of the youngest members of their labor force. This labor force is often engaged in several economic activities, frequently undertaken in different geographic areas. This may constrain household productivity. The aforementioned is of great importance to the Philippine rural, agricultural scene. There is a sifting out of the rural population occurring at this moment. Men in rural areas are primarily engaged in agricultural activities where they represent the household. These men are often married and their wife is an equal partner in the agricultural endeavor although the systems of enumeration used at the national scale do not reflect this partnership. Generally, this population active in agriculture is aging slightly as the young are educated and see little future in agriculture. They seek to migrate away from the isolation of the rural areas to the larger towns and cities of the country and the world. The movement of this active, educated population out of the area can deprive the rural areas of a population that could be adding value to locally produced agricultural products. In this study, the weavers in Matalom are a case in point. It was the only study area where women were staying in the rural areas as they had access to an alternative source of income, other than agriculture.

In all the other villages, local, short-distance movement was an important process and in the case of two of the peri-urban villages, some male heads of household were working outside their barangay and outside of agriculture. In these cases, the spouse of the head of household assumes the role of the primary agriculturalist. Underlying all these movements are the perennial problems of a lack of resources (land) to support more family members, and the lack of perceived return on investment if a young person were to stay on the farm and invest in methods to improve productivity.

Where populations are some distance from markets, the mobility of population results in a feminization of agriculture and an aging of the active population at the point of departure.

There may be a concentration of new agricultural settlements of young men and young women on the periphery of urban areas and various agricultural and non-agricultural lands. However, a feminization of agriculture is not taking place in the Philippines. If anything the migration induced changes are gender neutral, or biased in favor of males, as females migrate. There is, as noted, a propensity for young families, without education and prospects for urban-based employment, to deploy even further to the periphery in State-owned and highly marginal lands. These areas are also the repositories for the ill and infirm, widows and widowers and other people without firm attachment to place.

In the Philippines the population dynamics, land tenure modalities and agricultural production systems are becoming less stable. There is ample evidence to show that the young population is highly mobile and the swings both urbanward and rural-ward can be dramatic and of a large scale. The various boom and bust cycles in the urban economy are largely responsible so that when the economy performs reasonably well the young and educated literally flood out of the rural areas to the urban in search of wage employment. However, this same flood of people quickly returns to the rural areas when the urban economy collapses. The Philippine population has experienced two of these cycles in the last 15 years. Currently, the population is beginning the swing back toward urbanward movement as the impact of the Asia Crises weakens. When the youth return to the rural areas they rarely find employment. Rather they 'tread water' spending time living in the family home and being supported (with food, in particular) by the rural family members. This is not an insignificant process. More research needs to be done on how these rapid fluctuations of population impact on food production and intensification of agriculture, even if only for the short term.

12.6 - Are land tenure systems an obstacle to increased productivity?

The level of land tenure security is a major factor for the continuous exploitation of farm tracts and the intensification of agricultural production. This interrelationship was analyzed at the level of the household unit and especially at the level of the farm

itself through the study of a composition of the labor force and the level and nature of participation of its members in agricultural production.

Overall, activity in agricultural production is limited to the head of the household (typically male) and his wife. Children are rarely reported as being engaged in the household agricultural production unit. While men are generally thought of as being those who control land, there are no limitations in Philippine law to exclude women or young people from holding rights to land. Generally, if a person did not have access to land before they left to migrate (even seasonally) to the urban areas in search of work when they return they will not have access to land. This is of course not the case if they can secure some land from a direct or sometimes more distant relative. More often migrants are forced to the periphery to acquire land if that is their desire.

While we have mainly focused on the theme of migrants and circular migrants and their direct impact on agricultural intensification through their absence, there is also the impact of remittances that must be addressed. From the study sites it became apparent that investments in the intensification of agriculture are rarely the direct outcome of remittance from a family member residing in urban areas of the Philippines or overseas. Money is more likely to be spent on housing and education. The primary point of intersection between remittances and agriculture is the possible purchase of land thus expanding the family's land base. This does not presume that intensification will occur. Rather it is more likely to perpetuate disintensification or at best, the status quo. In the case of the former, purchased lands may be taken out of grain and other crop production and converted to pasture. In the latter case a tenant may be engaged to operate the newly acquired parcels and they will have little incentive to intensify, although this is dependent on the tenure agreement they are under.

With heavy out-migration occurring, a sense of fatalism exists over the state of tenure relations in the rural Philippines. The potential body of disaffected people that may push the government to change its policies is fractured and has lost its rural base owing to out migration.

Overall, the private ownership of land is not a necessary condition for the intensification of production and concomitant increased productivity. There are cases to support a wide range of tenure/productivity scenarios. What appears to drive innovation in the Philippines and the case study sites are two things. Firstly, innovation to maintain the status quo, meaning that farmers innovate in order to not slip further behind in their production and so as to avoid even greater poverty. As lands degrade and farms get smaller some level of innovation or intensification is required to just maintain the status quo. However, this is a losing game as eventually an upper limit of intensification will intersect with a declining resource base potentially resulting in a catastrophic collapse in the rural production system. Secondly, farmers respond to market incentives. In the case of grain production, incentives are non-existent. Guaranteed prices barely cover production costs and in some cases do not even cover expenses i.e. the farmer is losing by producing a crop for market. The only reason to cultivate land under these conditions is for the family table. In other commodity sectors price is a great motivator and can lead to the rapid uptake of new ideas and production systems (for example mango production in peri-urban Cebu). These incentives are yet to have an impact on the rice and corn markets of the Philippines.

12.7 - What is the capacity of the population engaged in agricultural activity, for intensifying their production and increasing their productivity?

The issue of the short-term or long-term participation of populations in agricultural activities is a central element for the study of the links between population dynamics, changes in the agricultural production systems and the adaptation of land tenure systems, since very important options, such as investments for intensifying agricultural production, the choice between owning land or simply having a guarantee or being able to exploit the land during one or more production cycles all depend on it. In reference to the studied areas there is a clear distinction, once again, between the flat wet and dry lowlands and the upland environments and populations. In the case of the lowlands, these are prized lands for which ownership is much desired. In the case of well irrigated lowlands, even a tenancy on

such lands is of great value versus insecurity in the marginal uplands. In the case of the former plantation lands there is a strong desire amongst the former laborers on the plantation to secure a piece of land through agrarian reform. For some they may never cultivate the land. Simply, having land is as prized as owning it and actually cultivating it. Generally speaking, the lowland areas with potentially greater productivity are subject to more long-term planning in their use. However, this must be put into context. Many of the agricultural systems being developed on the former plantation land are exactly the same ones used when the land was under one owner—sugarcane cultivation. The claimants of the former plantation soon realized that the best return on investment was obtained by cultivating sugar cane and selling to the local mill. Therefore the theory that an increase in tenure security might lead to a new and more sustainable farming system has not been played out in Boroc, Leyte. What will happen in the long term is probably more likely to be influenced by commodity prices than by demographics and tenure. Although the latter two variables might become more important as inheritance patterns lead to a fragmentation of the holdings, and as population pressure builds with both fragmentation and poorly managed urban-based industrialization.

In many places, the Philippines included, agriculture is no longer the main activity. Neither is it the first and only source of income for inhabitants. Given the importance of food production for a place like the Philippines with its high population growth rates, there is an urgent need to understand the links between population changes and agrarian changes, the effects of the demographic transition on the structure of the labor force, the linkages between security of land tenure and the proportion of the population engaged in agriculture.

In all the case studies the current land base cultivated by the resident population could not support the families in terms of their daily food needs. Supplemental incomes are thus integral to all the systems studied and we would argue this is the case throughout the country, in nearly all environments and in all family farm-based food production systems. This is critical to any understanding of where the food production system of the country may head in the

future. We have already established that there is a flight of young people away from agriculture, those left in the countryside tend to be old or unable to compete in the urban labor market where a high school graduation certificate is needed to secure most urban employment. Generally, the rural agricultural economy is not very diversified. Primary commodity production is commonplace but without locally-based secondary processing. The opportunities for the labor force to be absorbed locally are thus lacking. The one case we had where this was not the case was in the upland environment of Matalom where weaving was occurring. This was having a clear demographic impact with women staying in the community.

Agricultural value-adding is not commonplace in the rural areas but a whole host of service-related jobs have evolved and these engage more and more people part-time in agriculture but, who also derive an income outside of agriculture. These people are bus drivers, bus conductors, pedi-cab drivers, motorcycle drivers (for hire), they may work at a local rice or corn mill or may be a carpenter. All these jobs supplement the meager farm income. Under these situations the farm becomes more important as a source of sustenance than of income, with more and more of the produce being consumed in the home rather than being put on the market for sale. The question then becomes one of where the food will come from for those that wish to purchase it with the cash gained through off-farm laboring. With more and more of the rural agriculturalists engaging in off-farm income generating activities the time spent on the farm, assisting crop production diminishes and crop yields decline (losses from pestilence and disease increase). Similarly, the engagement needed to innovate and intensify may be lacking simply because they cannot afford the time to invest in such activities.

12.8 - Which changes in land tenure systems should be proposed?

The study of the relations between population migration, changes in the landuse modalities and changes in agricultural production and productivity will give indications as to how well adapted are the interventions of institutions, of those who own land rights or of those who work the land. Where interventions are ill-adapted, these must be called into question.

It is widely acknowledged in the literature, and is confirmed in this study, that the land tenure reforms both historically and currently are failing to address the perceived needs of the country. Rates of release of land have been slow, especially of the large land holding elite. A sizeable amount of the State's lands have been allocated in critical watersheds and other upland environments to the detriment of lowland environments reliant on the hydrological resources emanating from upland catchments. There is currently a bill being prepared for Congress which could end the allocation of State lands to private ownership. This is a long overdue bill but one that has yet to be read and passed by government. The outcome may be somewhat different from the original bill as on subsequent readings it is open for negotiation and manipulation.

Suggested changes to the land tenure system would allow for a better preparation of the soil, increased investments, changes in the ways parcels are used, leaving more room for longer plant cycles and further productivity increases. Subsequently these would be continued exploitation of land and intensification of agricultural production. A better security of land tenure is believed to be an essential element for adapting conditions to reach such objectives. The problem in the Philippines is that we have very few examples of expertly executed land reform from which to draw examples of the positive social, ecological and hence sustainable changes that can in theory occur. The example of the inefficient allocation of lands at the former sugar plantation in Ormoc is indicative of the general trend in resource allocation procedures. The well-connected and the peasantry claim land destined for reallocation before the State is organized to formally reallocate holdings. By the time the State is prepared, families have claimed land and made investments in it. If the State wishes to remove them and allocate land in line with the laws of agrarian reform they face enormous hurdles. In the past it was just one large landowner they needed to deal with but, with land seizures by those reclaiming the land, there are many more people to interact with and this increases the complexity and cost of running agrarian reform. In the end, a compromise is often struck and it is back to 'old wine in a new bottle' as Peter Krinks so aptly described the settlement of the frontier of Mindanao in the 1960s: old cultures of settlers brought all their old problems with them when they settled

the frontier. Breaking this cycle of corruption and inefficiency is daunting and may be impossible.

Changes in the systems of land tenure should occur particularly in new poles of development such as in the peripheries of big cities and around major food markets. The large poles of development set up new demands for agricultural produce and hence the opportunities to exploit new agricultural demands and intensity of production to satisfy the growing urban population. The case study of peri-urban Cebu is an excellent example of just such a phenomenon occurring. Vegetable farming and cut flower production has grown in the peri-urban environments we have studied. So too has mango production for export from the trade entrepôt defined by the emerging second major city of the Philippines (Cebu). This important and developing market is, unfortunately, not surrounded by flat, featureless plains that Von Thünen used to such great effect in his theories.

Cebu is wedged between the sea and steeply sloping mountains of marginal agricultural potential. The problem of topography is compounded by the juxtaposition of the city's key aquifers and watersheds being in the same place as the land being exploited to satisfy the special needs of the emerging market. To date it has been the environment that has suffered the greatest injury. However the social cost is also mounting as tenure arrangements support the rich and powerful over the more numerous poor and landless. It is our contention that the peri-urban area of Cebu represents one of the most intractable land tenure, population, and production problems in all of Southeast Asia. All the ingredients are in place for a very contentious show down. How it will all end is anyone's guess.

Agricultural development of new land areas and the use of land belonging to the State may provide solutions to situations of economic crisis or to difficult demographic challenges, but this can also lead to conflict. The allocation of new lands was the hallmark of Philippine land policy until the early 1970s (and the imposition of Martial Law). Up until that point the southern and largest island of Mindanao was the golden land which gave relief from the population pressure in the middle islands and Luzon. This came to

an abrupt end with the outbreak of civil war in Mindanao in the mid-1970s. This ushered in a new period of settlement redistribution with a more urbanward focus, but this did not materialize immediately. In the interim period a great deal of pressure for new land built up in the old settled areas in the middle part of the archipelago. This led to widespread incursions into fragile and protected upland areas managed by the State. While not actively discouraged, the impacts of this incursion would be long-felt and have serious longer term consequences for the lowland economies. The State then chose the easy route out of this cul-de-sac by allocating the newly cleared land to the cultivators on long term leases.

At this point in time it is safe to say that the Philippines has reached its limit of areas that can be cultivated effectively (Jackson 1992). This is not to say that new areas will not be opened for settlement or at least cultivation, but these remaining areas will be extremely remote, and fragile, and will also be the sites of some of the last remnants of the country's extremely rich and diverse flora and fauna. The question thus remains: what is the next step that government should take in the management of the State's lands? As already mentioned a bill is being prepared that will close the frontier from further settlement. If this bill is passed without substantial amendments then either widespread industrialization will have to occur to absorb the youth bulge in population currently being experienced, or there will be an exceptional pressure placed on already weakened rural production systems.

Similar to the question posed above with regard to State lands is the issue of the alienable and disposable lands for which the State also determines policy. Earlier policies regarding land reform have been largely ineffective. There appear early signs of a corporate farming structure emerging with large Philippine-based grocery and commercial chains developing their own production units by contracting for the production of goods from landowners (who then have tenants actually cultivating the land) or actually purchasing the lands themselves and hiring labor. Regardless of what system is to evolve in the private realm, in the future the government will need to play a role in protecting the weak and the vulnerable from chronic exploitation, extreme poverty and

malnutrition. This is a political necessity that each administration has recognized. As a final statement we wish to offer an alternative to the top down, Manila-based approach to land tenure reform and suggest that local leaders, responsible to their constituents, be vested with more responsibility in making decisions regarding land tenure in their jurisdictions. They know which land has been left vacant for many years, they know where the pressure points of population, land tenure and food security are most acute. They can then, with the local population, develop local solutions that will be of benefit to a greater number of people and enhance the productivity and food security of the nation as a whole.

These systems would therefore recognize the socio-cultural intricacies of local land holding and resource allocation practices. There is a paucity of such studies in the Philippines. The tradition has been to focus on the legal aspects of land ownership and reform and that drives the entire research agenda into the realm of the formal, State-defined and bureaucratic systems imposed by colonial powers. Moreover, there is also a bias toward the study of these elements in Luzon and often within a 100 kilometer radius of the primate city of Manila. The intricate systems of resource allocation, which are linked with land tenure and population change have resisted, to a large degree, the overriding goals of private ownership of land and the development of the independent, isolated, autarkic and presumably economically efficient family farms—a model imported from the United States in the early twentieth century. What is in place is a complex web of perceptions about the control of land and its products that are culturally mediated and locally derived and perpetuated. Future research needs to uncover these relationships and within them the points of contestation with the state-led bureaucratic model of reform. From this, perhaps a more locally-led and acceptable range of options for improving land management and food production could emerge with concomitant impacts on a range of population issues.

13.1 - References

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Appendix 1

<i>Number of members of the collective unit participating in agriculture</i>	<i>Sex composition of population of the collective unit engaged in agriculture</i>	<i>Sex distribution of the rest of the collective unit</i>	<i>Presence of children in the collective unit</i>	<i>Presence of people aged 65 and over in the collective unit</i>	<i>Category</i>
No person of 15 or over engaged in agriculture					01
Only one person aged 15 or over employed in agriculture	who is a woman	one man in the labor force (aged 15 or over) not employed in agriculture	one or more children	one or more > 65 no one > 65	02 03
			no children	one or more > 65 no one > 65	04 05
		one man (aged 15 or over) not in the labor force	one or more children	one or more > 65 no one > 65	06 07
			no children	one or more > 65 no one > 65	08 09
		no men aged 15 or over	one or more children	one or more > 65 no one > 65	10 11
			no children	one or more > 65 no one > 65	12 13
	who is a man	one woman in the labor force (aged 15 or over) not employed in agriculture	one or more children	one or more > 65 no one > 65	14 15
			no children	one or more > 65 no one > 65	16 17
		one woman of 15 or over not in the labor force	one or more children	one or more > 65 no one > 65	18 19
			no children	one or more > 65 no one > 65	20 21
		no women of 15 or over	one or more children	one or more > 65 no one > 65	22 23
			no children	one or more > 65 no one > 65	24 25
Two persons aged 15 or over employed in agriculture	who are both women	one man in the labor force (aged 15 or over) not employed in agriculture	one or more children	one or more > 65 no one > 65	26 27
			no children	one or more > 65 no one > 65	28 29
		one man aged 15 or over not in the labor force	one or more children	one or more > 65 no one > 65	30 31
			no children	one or more > 65 no one > 65	32 33
		no men aged 15 or over	one or more children	one or more > 65 no one > 65	34 35
			no children	one or more > 65 no one > 65	36 37
	who are a man and a woman or two men		one or more children	one or more > 65 no one > 65	38 39
			no children	one or more > 65 no one > 65	40 41
More than two people aged 15 or over engaged in agriculture	who are all women	at least one man (aged 15 or over) in the labor force not employed in agriculture	one or more children	one or more > 65 no one > 65	42 43
			no children	one or more > 65 no one > 65	44 45
		there is at least one man of 15 or over not in the labor force	one or more children	one or more > 65 no one > 65	46 47
			no children	one or more > 65 no one > 65	48 49
		there are no men of 15 or over	one or more children	one or more > 65 no one > 65	50 51
			no children	one or more > 65 no one > 65	52 53
	among whom there is at least one woman or only men		one or more children	one or more > 65 no one > 65	54 55
			no children	one or more > 65 no one > 65	56 57

<i>Sex ratio of the heads of collective units (when the head is employed in agriculture)</i>	<i>Sex ratio of the agricultural labor force</i>	<i>Ratio of men aged $\frac{15-34}{35-54}$ in the agricultural labor force</i>	<i>Category</i>
Less than 0.90	Less than 0.80	Less than 0.80	01
		0.80 à 0.89	02
		0.90 à 0.99	03
		1.00 and over	04
	0.80 to 0.89	Less than 0.80	05
		0.80 à 0.89	06
		0.90 to 0.99	07
		1.00 and over	08
	0.90 to 0.99	Less than 0.80	09
		0.80 to 0.89	10
		0.90 to 0.99	11
		1.00 and over	12
	1.00 and over	Less than 0.80	13
		0.80 to 0.89	14
		0.90 to 0.99	15
		1.00 and over	16
from 0.90 to 0.99	Less than 0.80	Less than 0.80	17
		0.80 to 0.89	18
		0.90 to 0.99	19
		1.00 and over	20
	0.80 to 0.89	Less than 0.80	21
		0.80 to 0.89	22
		0.90 to 0.99	23
		1.00 and over	24
	0.90 to 0.99	Less than 0.80	25
		0.80 to 0.89	26
		0.90 to 0.99	27
		1.00 and over	28
	1.00 and over	Less than 0.80	29
		0.80 to 0.89	30
		0.90 to 0.99	31
		1.00 and over	32
1.00 and over	Less than 0.80	Less than 0.80	33
		0.80 to 0.89	34
		0.90 to 0.99	35
		1.00 and over	36
	0.80 to 0.89	Less than 0.80	37
		0.80 to 0.89	38
		0.90 to 0.99	39
		1.00 and over	40
	0.90 to 0.99	Less than 0.80	41
		0.80 to 0.89	42
		0.90 to 0.99	43
		1.00 and over	44
	1.00 and over	Less than 0.80	45
		0.80 to 0.89	46
		0.90 to 0.99	47
		1.00 and over	48