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# Population Dynamics and Community Forestry in Thailand

## Understanding and Incorporating Population Issues into Forestry Development Plans and Programs

Institute for Population and Social Research
Mahidol University, Thailand.

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**2004**

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**Library of Congress Cataloging in Publication Data**

Population dynamics and community forestry in Thailand / Bencha Yoddumnern-Attig... [et al.]
(Mahidol University. Institute for Population and Social Research Publication; no 240)
ISBN 974-662-995-6

1. Thailand - - Population. 2. Population - - Environmental aspects. 3. Community forests - - Thailand - - Demographic aspects. I. Bencha Yoddumnern-Attig ... [et al.] II. Mahidol University. Institute for Population and Social Research. III. Series.

(HB 849.4 P831 1999)

**Second Publised:** July 2004

1,000 copies



**Published by:** Institute for Population and Social Research
Mahidol University
Salaya Campus Nakhon Pathom 73170, Thailand
Tel. (662) 441-0201 ext. 115; (662) 441-9666
Fax : (662) 441-9333
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# PREFACE

From 1994-1998, the Institute for Population and Social Research, with support from UNFPA and FAO, participated in an interregional project entitled "Planning for Community Forestry and Populations Issues" which included the countries of Bolivia, Nepal, Thailand and Uganda. This project aimed at building the capacities of foresters and population specialists to identify and integrate important population issues into the development of participatory resource management plans and programs, and especially those dealing with community forestry training. As part of this process, foresters need an understanding of the ways in which different characteristics of a population, and the macro-level development forces (e.g., political, economic) influencing them, can affect a community's changing use of natural resources over time.

National and international publications, government documents and interviews with environmental specialists in Thailand as well as Bolivia, Nepal and Uganda reveal, however, that this process is not an easy one. The relationship between population change and the environment is well-recognized, but it is complex and yet to be fully understood. Thus far population issues, when considered, have been predominantly used as background information for formulating descriptive community profiles. They have not been adequately used as analytical tools for understanding the relationship between communities, population change at local and higher levels, and the forested environment in which local people live. One of the reasons for this is that while the relationship between economics, environment and population is beyond controversy – and despite the willingness and good intentions of community foresters and allied development personnel to integrate population factors into their future participatory planning and management practices – there continues to be a lack of appropriate tools and experiences for them to follow.

This casebook seeks to begin rectifying this problem by presenting Thailand's situation with regards to its population development over time, its relationship to forest resource use, and how experiences in working with community forest people can bring to light a working understanding for integrating population considerations into community forest planning and management. It is hoped that the results of this study will be a valuable resource for community foresters and others as they strive to strike a balance between the needs of both forested environments and their inhabitants.

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# ACKNOWLEDGMENTS

Prior to and during its development, this casebook benefited from the contributions of many organizations and individuals. Funding for the project which resulted in this book was provided by the United Nations Population Fund (UNFPA), while its successful execution was guided by the Food and Agriculture Organization of the United Nations (FAO) through its Population Program (ESDP) and the Community Forestry Unit (FONP). Without these organization's support, data collection and the compilation of this report would not have been possible. Hence, we owe them our deepest gratitude. We would also like to thank the many experts from the other country teams of Bolivia, Nepal and Uganda for their comments and suggestions on earlier drafts of Thailand's country profile and case study on population issues relevant to community forestry.

Our sincerest appreciation also goes to Dr. Aphichat Chamratrithirong, former director of IPSR and current member of UNFPA's Country Support Team in Bangkok, Dr. Vitoon Viriyasakultorn of the Regional Community Forestry Training Center at Kasetsart University, and Dr. Anuchat Puangsomlee of the Faculty of Environment and Resource Studies at Mahidol University. Their respective expertise in sociology/ demography, social forestry and human ecology contributed immensely to this study's outcomes. We likewise express our thanks to the IPSR administration section headed by Ms. Aurapan Hanchangsith for logistical support.

Finally, we are deeply indebted to the field researchers and community members for the insights they have given us on the in-depth relationship forest communities have with their environment, both as a resource and a social domain. The data they provided were invaluable in establishing the benchmarks and framework to better understand the nature of community forestry and its stakeholders in Thailand.

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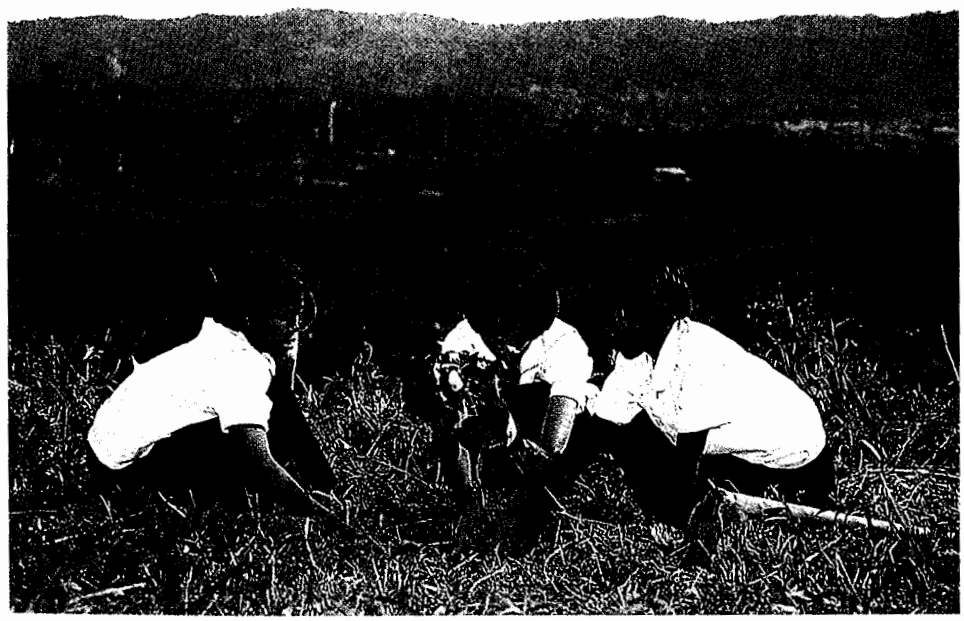


*Courtesy to Prasan Sumprasantikul*

# Population Issues and Community Forestry

## Population and the Community Forest Environment

Population changes at national, community and even family levels can influence the use of forest and other resources in a variety of ways, and a great deal of research has been done on trying to identify the precise relationship between population change and natural resource conditions. On the one hand, much of the literature has looked at how population *growth* can lead to environmental destruction (Abernathy 1993; Myers 1991; Wilson 1992). It is based on the belief that growing numbers and concentrations of people can lead to the over-use, and thus destruction, of resources unless proper resource management and population control practices are employed.

Population growth, however, is only one feature of population change; other population forces exist (e.g., population composition, structure, migration) that can also affect resource use by influencing the decisions and behaviors of forest users at all levels (Bilsborrow and DeLargy 1991; Wilde and Vainio-Mattila 1995). In Nepal for example, population growth has comparatively little impact on forest conditions. Rather, such conditions are determined more by how local communities organize themselves and create durable social institutions so that they can successfully manage their natural resources, even when they are faced by complex political, economic and demographic forces (Varughese 1998). Similarly, other research studies have shown that population change may not lead to environmental degradation. Rather, it can stimulate economic development and create innovative resource management practices at local and national levels that can actually help to preserve and expand upon the amount of available resources (Boserup 1965, 1981).

Rather than enter into the ongoing debate between the nature of population change and the environment, this casebook uses Thailand as its reference in order to contribute to the growing body of literature that is looking at how countries *and* communities adapt themselves to cope with mounting population and environmental changes (cf. Arizpe, Stone and Major 1994; Varughese 1998). Such an investigation adopts a dual perspective, firstly by examining forces affecting natural resource use at a macro-level, and then looking at how forest communities and households cope with the prevailing population and environmental changes that have been brought upon them.

In addition, this casebook is also meant to as a guide to help foresters and allied development personnel to see the implications of population issues for planning and managing participatory community forestry programs. During the 1980s, the main concern of foresters was to safeguard forests from encroachment and destruction, especially in environmentally sensitive areas. This entailed, amongst other duties, regulating the felling of trees for industry while monitoring and promoting reforestation schemes to assure the regeneration of forests. Trees were the foresters' main concern; how people were affected by forestry measures was not considered part of their professional responsibilities (FAO 1989).

This perspective began to change when it was realized that the economic progress sought by many developing countries was based to a large extent on the destruction of natural resources, and as the effects of this destruction in terms of soil erosion, flooding, nutrient depletion, salinization and loss of biological diversity became tragically evident. The late 1980s and 1990s thus saw a change in perspective, focusing on integrated management strategies that considered both the rehabilitation and sustained productivity of forests and their resources. Addressing the interrelated problems of environmental degradation and rural poverty became a priority concern, and it was soon realized that the most sustainable and cost-effective strategy would be to involve local people in the resource management process. Consequently, foresters and forestry departments began to extend their concern; they started looking beyond the trees to the people which lived in close relationship with them. This concept took root and developed into a community forestry approach in many countries including Thailand.

## Benefits of a Population Perspective

Developing forestry policies and implementing community forestry plans and programs involves both *natural resource development* and *human resource development.* The former lies within the traditional domain of foresters who are knowledgeable about the technical and environmental aspects of forestry development. Usually their responsibilities center on the concrete and quantifiable results required by their annual work plans, such as the number of trees planted, seedlings raised, hectares covered by irrigation, and so on.

But for human resource development, it requires detailed information about people's lives; about "who" people are, what are their needs and priorities, how do these affect people's use and management of natural resources, and how do community members cope with changing social, economic, population and environmental pressures in order to maintain their way of life. Because the root causes of deforestation, soil degradation, disturbances to water regimes, etc. are very often found outside the forestry sector itself and within the realm of the lives of the local people, analyzing these and other population issues can provide an excellent starting point for optimally *planning sustainable development initiatives.* At this stage, population analysis becomes a practical tool for investigating the history and diversity of a community and its implications for developing participatory resource planning and management strategies. Such an analysis focuses on key characteristics, needs, decisions and activities of the local people and how these impact—either positively or negatively—on resource use and community forestry development.

A population analysis also *gives a broad people-environment perspective.* It begins by recognizing that every community and development situation is different, simply because no individual or community is under the same set of resource demands and constraints. As a result, development programs that aim to preserve local resources while fulfilling people's needs require important population insights into several areas that affect people's lives and their resource use. By looking into such issues as educa-

tional patterns, socio-economic status, labor movements, gender norms, ethnicity and so on, one can see who is doing what with regards to resource use, why, and who will benefit or lose when development or intervention activities are undertaken. Such a population-based perspective can go a long way in *promoting forestry program success*.

A population analysis can also lead to *positive social impacts* for forestry development, the initiatives of which cannot be deemed successful if they lead to undesired social changes or trends. By revealing the intimate relationship between people and forests, how men and women (singularly and together) use and manage forest resources, and the importance of their activities for subsistence, income and the future of their children, forestry development strategies can be designed to provide for both the needs of forests and the people that depend on them. This reduces the likelihood that forestry development programs will have negative impacts, fail to reach objectives, and lead to conflicts between foresters and the local people.

A population analysis can also lead to the *efficient use of scarce resources*. Community forestry is based on "people's participation." But exactly who will be the primary people involved in undertaking activities? At this point, uncovering the different roles that family and community members as well as men and women play in resource obtainment and use will help to point out the exact target participants for a resource management plan and thus more efficiently identify and fulfill development objectives.

What must be remembered, though, is that natural resources and people are ever-changing. In the past when population issues were considered, they were usually restricted to static analyses of population growth and density. These sunchronic snapshots in time, though, did not give a clear, continuous picture of community, population and environmental change over time.

For Thailand, at least, a dynamic temporal perspective is crucially important for understanding the relationship between population change and resource use. The nation has undergone changes in economics and its population, whereby the country's rapid economic development has been accompanied by a phenomenally rapid *decline* in population growth. Consequently, several key issues related to population dynamics—such as community and household demographics, family formation, migration, occupation and educational structure, division of labor, and gender roles—need to be studied diachronically in terms of their impact on forest users and their resources.

Such a time series perspective is valuable for foresters and allied development personnel, because it can assist them and the local people in assessing what important population issues have impacted (positively or negatively) on local forestry conditions over time, what are or have been their underlying causes, and then identify feasible actions that can be included as part of the development of decentralized and participatory forestry management plans. This increased insight and sensitivity towards changing

local conditions has the potential to mediate part, if not much, of the conflict existing now between foresters on the one hand and the local people on the other.

## Organization

This study of population dynamics and community forestry in Thailand begins with an overview of Thailand's situation with regards to its major population changes. This overview provides the backdrop for a review in the second section of national forest policy and actions, especially with regards to deforestation and its causes, and the phases that have emerged in forestry policy and management. The third section then looks at the linkages between forestry, communities and populations, an analysis that is examined in greater detail in the study's fourth section which presents a case study of population dynamics and community forestry in Northern Thailand. Special attention is placed on understanding how the implications of population changes over time have led to current community forestry actions. This study ends with a look at population and community forestry training program needs and those important population issues that should be considered and incorporated into forestry training, planning and programming.

# POPULATION AND DEVELOPMENT IN THAILAND

Understanding the relationship between population change and resource use requires a macro- and a micro-level perspective. At the macro-level, changes in population and resource use patterns are usually stimulated by prevailing conditions at international and national levels, and these continually change over time. Usually economic and/or political in nature, these forces can entail national policies and programs that aim at increasing the supply of specific human and nonhuman resources (e.g., quantity and quality of the work force, agricultural commodities, lumber and other forest products) that a country needs to promote its economic development and satisfy international market demands. Alternatively, and as presented in the next chapter, they may entail specific global or national policies that seek to limit the use of ecologically fragile resources. In either case, these macro-level forces direct the use of resources at national and community levels, promote changes in important structures of society and its communities as well as changes in a country's population profile, and important demographic behaviors at all levels.

This chapter looks at some of these forces as they had been operating in Thailand as of early 1997 when the documentary and field research for the interregional FAO/UNFPA project was undertaken and before the Asian economic crisis took firm hold. An understanding of these forces is crucial because at the micro-level, forest communities and households orient their resource use patterns, productive and reproductive behaviors in response to these larger, prevailing conditions and macro-level demands, so that they can maximize their survival over time.

## CLIMATE, GEOGRAPHY AND PEOPLE

The Kingdom of Thailand is located in central Southeast Asia and is bordered by Laos and Cambodia on the east and northeast, Burma (Myanmar) on the west and northwest, and Malaysia to the south. Thailand's climate is tropical and much influenced by the powerful South and Southeast Asian monsoons which arise from seasonal differences in temperatures between the land mass and oceanic body.

The nation's total land mass is 513,000 square kilometers with a population density of 115 per square kilometer, a figure much lower than that of several other Asian countries (UNFPA 1991, 1995). Thailand contains five regions. The *Northern region* consists of heavily forested mountain ranges and valleys and has been an area of heavy logging and deforestation activity. The major tributaries draining water from Northern mountain ranges merge to form major rivers which feed the fertile, rice-producing *Central plains region*. The *Eastern coastal seaboard* stretches to the Thai-Cambodian border and is an area where the Thai government is strongly emphasizing industrial development, in part to relieve problems of heavy urban-based industrialization in Bangkok with its resulting environmental degradation. Thailand's *Northeastern region* is an arid plateau containing high saline soils which limit agricultural production.

The majority of the Thai live in this region and it has the distinct reputation of having the most people below the poverty line. It also has the least amount of forested area remaining in the nation which has led certain population groups to migrate to other more heavily forested areas such as Northern and Central-Western Thailand. Finally, there is the *Southern region*, a moist peninsula bordering on Malaysia with a relatively high Muslim population compared to other regions.

The nation contains 62 million people as of 1999 who reside in 76 provinces, over 700 districts, about 8,000 subdistricts and over 60,000 villages. The Central region, excluding Bangkok, is the most densely populated, while the Northeast has the largest number of people, and the South has the least population. Thailand's population is projected to increase to 64 million by the year 2000 (NESDB 1994).

Thailand is relatively homogeneous. Over 80 percent of the population are ethnic Thai, and about 10 percent of the population are of Chinese descent. Malay ethnic groups inhabit Southern Thailand, and several hilltribes dwell in the Northern mountains. Regarding religion, 95 percent of the Thai are Buddhist, 3.8 percent are Muslim, 0.5 percent Christian, 0.1 percent Hindu, and 0.6 percent adhere to other religions (UNFPA 1995). For literacy, the long-standing six-year compulsory primary education for all children has led to well over 90 percent literacy for men and women in both rural and urban areas.

The Thai people are relatively healthy by developing country standards. They are now living longer, fuller lives than their peers did only a generation ago. Men can now expect to live at least to the age of about 68 years, compared to only 54 years in 1961. Life expectancy for women has also increased from 59 years in 1961 to 72 years (Institute for Population and Social Research 1999). These rates are comparable to those of several industrialized countries.

Along with increased life expectancy, Thailand's mortality rate has helped to shape the nation's population picture. Declining trends in mortality began in the 1920s and have reached low levels today because of vast improvements in public health, health services delivery and education (UNFPA 1995). In particular, Thailand has one of the most extensive primary health care systems in the world with health services reaching to virtually all rural communities. This health delivery system has helped the nation to cut its crude death rate to a low of 7 per 1,000 population in 1997. The Thai are now faced less by health problems associated with developing countries (such as infectious and parasitic diseases and nutritional deficiencies) than those more characteristic of industrialized nations (e.g., heart disease, cancer and stroke).

Likewise, over the past thirty years the infant mortality rate has declined dramatically from 103 infant deaths per 1,000 live births in 1960 to 31 by 1997. Under-five mortality dropped from 148 per 1,000 live birth births in 1960 to only 38 by 1997. These rates are quickly approaching those of developed countries due to better access to health and medical care, a successful Expanded Program for Immunization (EPI) with

over 80 percent total coverage, and general improvements in the standard of living. Maternal mortality has also fallen to 44 per 100,000 live births, one of the lowest in the region. Assisting this decline is that over 80 percent of Thai women receive antenatal care and over 70 percent give birth in medical or health facilities (UNFPA 1995, UNICEF 1998). Thailand's healthy population and declining trends in mortality might imply that the country has a high population growth rate which could adversely affect the environment. Fortunately, this is not the case.

## Population Change

Thailand's success in population development is well-documented and known throughout the world. Starting in the early 1970s, the nation has been very successful in lowering its population growth rate from 2.1 percent in 1980 to 1.2 percent by 1996. According to the 1995 Population Data Sheet, put out by the Economic and Social Commission for Asia and the Pacific (ESCAP), Thailand had already reached an annual growth rate of 1.1 percent, the same as that for North America. Thailand's future growth potential is under control since fertility has been below replacement level for the last five years. The nation's Total Fertility Rate is now 1.8, a significant decrease from 3.5 in 1980.

Thailand's fertility decline since the mid-1960s has been among the fastest in the developing world. It is especially notable because *fertility began to fall while the country was still predominantly rural and agricultural and it has declined equally in both rural and urban areas*. Particularly striking has been the pervasive nature of reproductive change. A preference for small families, increased contraceptive prevalence and declining fertility now characterize almost all major segments of Thai society. Only a generation ago, married women averaged 6 to 7 live births. By 1981, only one in ten women wanted more than two children. This means that Thai women have not been burdened with giving birth to and raising at least four additional children. Consequently, they have been entering the labor market at earlier ages. For some occupations such as education and medicine they are equal to men in numbers, while in certain industries like textile manufacturing they far surpass men. Thus, Thai women are able to make greater contributions to their own, their families' and the nation's rapid socio-economic advancement (UNFPA 1995).

Thailand's population growth rate will decline slowly over the next two decades. The proportion of women of reproductive age is peaking and will level off by the turn of the century before beginning to decline thereafter. One reason for this trend is that Thailand's population is "aging." The population under 15 years of age has declined from 45 percent in 1970 to 32 percent in 1991, and is projected to reach 27 by the year 2000. This rate, however, is below that expected for developing nations as a whole at 34 percent by the turn of the century. Meanwhile the percentage of the population over 60 years of age is increasing from about 5 percent in 1970 to an estimated 8 percent by the year 2000. Thailand needs to consider the implications that this new

population picture will have on its future supply of working age laborers, important population dynamics issues such as migration and the welfare needs of the elderly, as well as the changing composition of rural households and their resource use needs (UNFPA 1995).

Several social and cultural factors have helped Thailand to control its population growth. The first is the positive role Thailand's National Family Planning Program (NFPP) has played in increasing accessibility to and acceptability of contraceptives throughout the Kingdom among both women and men. Globally, between 1960-1965 and 1990, contraceptive prevalence in all developing countries increased from 9 to 51 percent; in East Asia from 13 to 70 percent, in South Asia from 7 to 40 percent, in Latin America from 14-60 percent, and in Africa from 5 to 17 percent (UNICEF 1994). Due to the NFPP's efforts, Thailand surpassed these figures. The contraceptive prevalence rate among currently married women aged 15-44 increased from approximately 15 percent in 1970 to 75 percent in 1997 (UNICEF 1998). Unmet need, or those individuals or couples who want to avoid an unwanted pregnancy but are not practicing contraception, rests at only 5 percent, one of the lowest rates in Asia and the Pacific region (Yoddumnern-Attig et al. 1995).

The NFPP's important role rested not only in providing contraceptives to meet existing demand, but also in increasing knowledge about family planning and contraception. Through well-orchestrated mass media and interpersonal programs, the diffusion of knowledge and information was rapid in rural and urban areas. By the mid-1970s, 97 percent of ever-married women reported knowledge and general approval of contraception. Even in Southern Thailand, the region with the lowest levels of contraceptive use, by the start of the 1980s, 98 percent of ever-married women had heard of at least one contraceptive method (Guest 1994).

## Economic and Social Development

Before 1997 when the Asian economic crisis hit, Thailand's positive population picture also facilitated her social and economic development, and her rapid recovery from the crisis looks promising. Unlike her other Southeast Asian neighbors, Thailand was never colonized which has allowed the country to develop its own social, political and economic infrastructures free from domination by any external power. Thailand thus avoided the need to restructure itself after colonial rule, which can slow overall development. This may, at least in part, account for the nation's more rapid development (UNFPA 1995; Yoddumnern-Attig et al. 1995).

Thailand recorded a double-digit economic growth rate of around 10.4 percent for the period of 1986-1990, which is considered to be the golden era of the Thai economy. Thailand was one of the countries with the highest growth rates in the world for that period, even surpassing the growth rates of most industrialized economies (Group of 7 or G-7) (Ogena et al. 1997). Thailand has restructured its economy from one domi-

nated by agriculture to a modern industrial economy, characterized by labor intensive manufactured exports and, more recently, medium-high technology exports. The value of manufactured exports surpassed the value of agricultural exports for the first time in 1985. From that time on, manufactured exports have increased by about 30-40 percent per year, while agricultural exports have been growing at 5-10 percent per annum. By 1990, the value of manufactured exports was over three times greater than that of agricultural exports (Ogena et al. 1997).

Despite Thailand's high economic growth, income disparities have widened among different groups of people in cities as well as between rural and urban areas. For example, the proportion of the top 20 percent of the wealthiest households (usually located cities) increased from 49.3 percent in 1976 to 54.9 percent by 1987/1988. In contrast, income proportion for the bottom 20 percent (found usually in rural and urban poor areas) dropped from 6.1 percent to 4.5 percent during the same period. This situation has arisen mainly due to changes in the urban production structure which is becoming more lucrative by virtue of being industry and services oriented (The Government of Thailand 1995).

Nonetheless, about 70 percent of the Thai people still live in rural areas and earn livelihoods principally from agriculture. But while agricultural products have been the nation's major export earner over the past two decades, this has come about through increases in agricultural land area rather than increases in the yield per unit of land area (Onchan 1987). Consequently, the limits of the nation's land resources are now being approached. Nevertheless, the government promotes land reform as an essential component to help alleviate poverty and its consequences, whereby land is redistributed to those in need and already unusable lands such as degraded forests are converted for general habitation (The Government of Thailand 1995; Khantawong 1988).

## Urbanization and Migration

Thailand's economic success has been primarily an urban phenomenon which has led to an increase in the nation's urban population from 24 percent of the total population in 1975 to 32 percent by 1990; it is expected to reach 39 percent by the year 2000. While half of this population lives in the Bangkok Metropolitan Area, in recent years other major urban centers throughout the country have been increasingly attracting rural migrants. Due to this internal migration from rural areas to Bangkok and other major cities, urban residents suffer severe shortages of public utilities, facilities and housing, and increases in unemployment, crime, environmental deterioration and pollution. Presently, Bangkok can be classified as a mega-city with a population that is 22 times larger than the second largest city in Thailand. As a province, Bangkok's population is more than twice that of the second largest province (NESDB 1994).

Thailand's shift from an agriculturally-based economy to one more dependent on commerce, manufacturing and services has thus led to a large-scale change in migration

from a rural-to-rural pattern to one that is heavily rural-to-urban. More importantly, this change has also led to a rise in female labor force participation through greater geographic mobility. While men represent the highest proportion of intra-regional as well as rural-to-rural migrants, women predominate in rural-to-urban migration streams. The volume and rate of female migration has increased and outnumbers the migration of men to Bangkok (Sethaput and Yoddumnern-Attig 1992). Moreover, women are more likely to migrate when they are between 15 and 24 years and 60 years and over; men dominate in the 25-44 and 50-59 age groups (Leenothai 1991). The increasing predominance of female migrants, and to an extent men as well, is partly the result of social changes that have loosened restrictions on social and geographic movements, encouraged an increased proportion of individuals to enroll in urban schools, along with Bangkok's economic development which now offers more attractive job opportunities for women than other places.

These factors, however, represent only one side of the coin, namely those that pull migrants to cities. Simultaneously, the increasingly precarious nature of rural life is also working to push them away from their natal communities either temporarily, seasonally or sometimes permanently. In particular, rural people's economic pursuits have led to rapid forest depletion and related soil degradation, mainly due to unsustainable agricultural practices and commercial logging, which places agricultural and other natural resources in jeopardy. Flooding and other natural disasters also pose a major challenge. Water supply and distribution for rural and urban use is becoming difficult, in part as a result of climatic instability but also due to the ineffective management of water supplies (NESDB 1994). In Northern Thailand especially, decreased land and water availability for agricultural purposes has led to a growing number of landless people. As a result, many landless families, and especially their young members, are forced into the industrialized labor market in order to put food on their tables (Yoddumnern-Attig and Attig 1993:282). Moreover, in certain areas such as rural Northeast and Northern Thailand, the main inhabitants of villages are the old and the very young who must survive on what they can glean from their surroundings in addition to any, oftentimes irregular, monetary remittances from family migrants.

The plight of the rural poor and the role that internal migration plays in unbalanced population distribution is fully recognized by the Thai government. However, no policies are applied which directly intervene in the migration decisions of individuals. There are no legal or administrative restrictions to geographic mobility. Instead, indirect policies, primarily aimed at affecting the location and development of economic activities, have been instituted to redirect internal migration. All of Thailand's Five-Year Economic and Social Development Plans since the Fourth Plan (1977-1981) have included policies designed to promote economic growth outside of Bangkok, discourage the expansion of industries within Bangkok, and decentralize government services (NESDB 1994).

## Family Change

Thailand is a nation of young people. Thirty-three percent–or 19.96 million of her 60 million people–are under the age of 18; 27 percent (16.2 million) are below age 15; while 8.7 percent (5.2 million) are youth aged 10-18. These children are growing up in an increasingly affluent and sophisticated society, one that is profoundly different in very fundamental ways from the traditional childhood of their parents and grandparents.

While only slightly more than 30 percent of Thailand's people live in cities, the urban way of life from its diverse income opportunities, materialistic desires, to modern, often imported, value systems now embraces virtually all rural villages, rapidly transforming the desires and lives of children and their families in ways never expected only a generation ago. Most notably, improved communications in the form of the introduction of television nationwide in the seventies and growing access to the global information network today has brought greatly increased economic expectations for consumer goods and also for improvements in health, education and quality of life.

Among other socio-economic changes, Thailand's rapid economic development has led to transformations within the family and especially with regards to children and family size. In particular, while traditional rural Thai families were customarily large, couples in modern day Thailand now feel that a large family is an unnecessary burden, and parents anticipate more of an immediate problem in raising and especially educating their children. As one Northern Thai women noted, *In the past, the parent's prime responsibility and concern was to feed their children. Today, the parent's prime responsibility and concern is to educate their children* (Yoddumnern-Attig 1995). This desire for small families and even the use of contraceptives are not only fuelled by Thailand's rapid economic development and life-style changes; they are also supported by the Thai cultural setting and its Buddhist attitudes which have facilitated the dissemination and acceptance of voluntary contraception within a cultural context whereby children are still valued as productive assets to the family. The major difference here, however, is that among wealthier, urban parents, children are felt to have greater long-term value and thus education and the hope of a secure future are emphasized. Among rural parents, though, short-term economic needs are overwhelming 'push' factors whereby children become an active part of the labor force, often migrating out to large urban centers shortly after completing primary school.

## Labor Force and Educational Needs

Thailand's labor force is still growing rapidly, despite a decline in the number of entrants resulting from earlier fertility declines and the Asian economic crisis. But if agricultural incomes are to rise on an equitable basis with increases in income in more favored urban areas, agriculture needs to raise output per hectare or shed labor (and almost certainly both). Consequently there is no need to fear a labor shortage as such;

indeed, the influx of low-skilled migrants from neighboring countries unfortunately ensures that such a shortage will not develop. The challenge is to turn agricultural workers into productive workers in non-agricultural sectors. There are two elements to this: the need for technological changes in agriculture which enable an absolute shedding of labor, and the need for more effective absorption of seasonally-idle agricultural workers into non-agricultural activities during the slack season. Towards this end, special efforts will be needed to educate and train workers shed from agriculture, most of whom have little education, so that they can enter productive work in sectors such as manufacturing, transport and services (UNICEF 1997).

This will be no easy challenge. On the positive side, Thailand's rural population has greater access to education than ever before, with 97.7 percent of school-age children nationwide completing at least six years of basic education. Ninety-three percent of people over age six are literate, with the male literacy rate of 94.7 percent being slightly higher than the female rate of 91.3 percent. Thailand has extended compulsory education from six to nine years, and its Eighth National Social and Economic Development Plan (1997-2001) strives to bring it up to 12 years. Nevertheless, the secondary school enrolment rate remains one of the lowest in the Asian region, but with little gender disparity (34 percent male; 32 percent female). Information from the National Education Commission, moreover, shows a falling trend in primary retention rates (75.8 percent for children enrolled from 1989-1994; 69.4 percent for those enrolled from 1991-1996) as well as rising trends among children who must repeat a grade (14.7 percent for 1989-1994; 16.8 percent for 1991-1996) and those who drop out (9.5 percent for 1989-1994; 13.8 percent for 1991-1996). While the general rate of drop out beyond compulsory education is very high, the rate is about equal for boys and girls (UNICEF 1997).

Projections indicate that even as far ahead as 2010, almost two-thirds of Thailand's work force will have only a primary school education. This complicates Thailand's poverty picture even more. Data over the last ten years show that those with only a primary education or below are being pushed into the low paying segments of the labor market. At the same time, they are slowly being forced out of employment in industry and service sectors, since the latter now want more highly educated and trainable workers to deal with modern factory technologies.

In summary, the internal stability and the productivity of the Thai labor force, coupled with the entrepreneurial flair of the business sector, have led Thailand's economy to grow at an unmatched pace. But as with many developing countries, rapid economic growth has led to a growing disparity between urban and rural economic well-being as well as income disparities even within regions. The majority of the rural poor have only an elementary education, and are engaged in agriculture or as laborers. In their effort to raise household incomes and quench their thirst for modernity–or simply survival–farmers are under mounting pressures to sell land and leave for the cities. Ironically, after being disillusioned by city life, they sometimes return to work as paid laborers on the land that was once their own.

# National Forest Policy and Action

## Deforestation and Its Causes

Since ancient times, Thailand's rural countryside and its people have been blessed with a wealth of natural resources. Copious rainfall, ample sunlight, and fertile land have permitted the evolution of a prosperous agricultural society. Farm profits provided the foundation for a mercantile economy whose growth reached unprecedented heights. Nature's abundance spawned a confidence that resources exist in infinite quantities and can be harvested forever. But rapid development has created some unsettling problems which threaten to cloud the future of Thailand's people.

Forests have been felled to supply domestic and export markets and to feed a growing hunger for new farmland. Smokestacks are replacing rice stalks. Golf greens and resorts rise from valleys formerly carpeted in paddy fields or even previously wooded hillsides as leisure industries cut swathes through the countryside. Rivers have been dredged for construction sand, drained of water for industry and irrigation purposes, dammed for hydroelectric power, and poisoned by pesticides, herbicides, and chemical fertilizers.

Dwindling land reserves and sluggish land reform programs have compelled farm families to abandon ancient homesteads and to clear fields in the few remaining virgin forests. Once regarded as heroic pioneers, they are now seen as despoilers, poachers and illegal squatters. The remainder are regarded as a low-cost labor force for the new mills and factories. Thailand's rapid transformation from an agricultural to an industrializing nation has thus brought a host of problems which directly affect both people and the environment (The Thai Government, n.d.).

The issue of forest conservation in Thailand is a long-standing one, reaching as far back as the 1880s when Royal Proclamations were enacted to address the sale, transportation and possession of teak logs and teakwood. Forests at that time were the property of and controlled by feudal chiefs, and concessions to exploit the teak forests led to their deterioration and disputes among concessionaires. Three years after the establishment of the Royal Forestry Department (RFD) in 1896 by King Chulalongkorn, ownership and control of all forests were transferred from the feudal chiefs to the government. At the same time, several laws and regulations on forest protection were enacted including the Forest Protection Act of 1897, the Teak Trees Protection Act of 1897, the Act prohibiting illegal marking of timber in 1898, and the Act prohibiting the extraction of teak timber without paying royalties or duties which was enacted in 1899. As the years passed, however, other problems arose which led the government to establish a new series of forest laws beginning with the Forest Care Act in 1913 through the National Park Act of 1961 and the National Forest Reserve Act of 1964.

Until the middle of this century, Thailand was covered in vast forests that provided housing and protected valuable watersheds. The damage from commercial logging in

the early part of the century was accelerated in the 1950s. By 1970, only 50 percent of Thailand was forested. By 1985, satellite imagery revealed that forest cover had shrunk to 27 percent. Recent estimates place the forest cover at between 10 and 23 percent (The Government of Thailand, n.d.)

A complex interplay of factors has operated to reduce the natural forest area of Thailand. Poorly managed official logging and illegal logging, encroachment by landless farmers and private entrepreneurs, hilltribesmen and other shifting cultivators are just some of the threats to the country's forests (TDRI 1987). While logging has been officially banned since 1989, land clearance for agriculture continues albeit at a reduced rate. The consequences of deforestation are far reaching. Since 1980, the Meteorological Department has recorded a nationwide temperature rise of 0.7-1.0 degrees Celsius. Watershed destruction has led to rainfall decreases. Logging has contributed to flooding, soil erosion, a shortage of irrigation and drinking water, and a decline in food production capability.

## Phases in Forestry Policy and Management

The Royal Thai Government (RTG) is well aware of the damage that has been done to Thailand's forests, and it has adopted several strategies designed to halt, or at least slow, the process of deforestation. Commitments to forest protection can be found in each of Thailand's National Economic and Social Development Plans (NESDPs) which have tried to strike a balance between economic development on the one hand, and forest preservation on the other. The gradual changes in Thai forest management can be grouped into five phases as follows (Pragtong and Thomas 1990; TDRI 1987) which together show a gradual progression from government control over forest preservation to one of shared community and government control.

**Phase 1, A Time of Plenty: 1896-1953.** During this phase, forests were plentiful and harvested in the national interest. Emphasis was placed on regulating and controlling wood and non-wood products for export and domestic use.

**Phase 2, Land Allocation: 1954-1967.** During this period, the government allocated land for economic development. Forest policy complied with the national policy of land allocation to farmers. Allocations were made to establish new villages on virgin lands, primarily to settle landless families or to resettle those displaced from sensitive areas by floods, dam inundation or other factors. Thailand's First National Economic Development Plan (1961-1966) had a stated forest policy to preserve 50 percent of national land or about 160 million rai (6.25 rai = 1 ha) as forestland. This land took the form of National Reserved Forests, National Parks, and Wildlife Sanctuaries in the Acts of 1964, 1961 and 1960 respectively. A forest village program was also initiated by the Forest Industrial Organization (FIO) in the 1960s. The FIO was an autonomous government corporation set up to harvest the teak forests. In line with the Thai Government's policy of encouraging concessionaires to reforest, the FIO was widely

involved in reforestation. By 1983, the FIO had established 42 forest villages involving a total population of 9,518 or 1,847 households, with one-half being located in Northern Thailand. This number rose to 53 forest areas throughout Thailand by 1987 (TDRI 1987). The FIO continues to operate a network of forest tree nurseries which supply plant materials for reforestation activities.

**Phase 3, A Vanishing Frontier: 1968-1980.** Despite all efforts, the forest frontier continued to vanish for two main reasons. The first was the government's emphasis on agricultural production to fuel the engine of national development. This involved especially policies dealing with land reform, ownership and allocation. During the Second National Economic and Social Development Plan (1967-1971), for instance, the focus was on improving landownership for agriculture, land-leasing systems for agriculture and agricultural productivity. The Third NESDP (1972-1976) followed upon this policy with a focus on ownership, the need to prevent or eliminate the loss of landownership by farmers and to increase farmer landholding, land productivity and, increasingly, land conservation. Thereafter, the Fourth NESDP (1977-1981) saw land reform as a primary component of agricultural development. Land use regulations were made more responsive to economic, social, political and natural environmental conditions (TDRI 1987).

In dealing with the issue of settlements in degraded forest reserves, one of the government's approaches has been to implement land reform through such vehicles as the Land Reform Act of 1975 wherein degraded forests are declared a land reform area. Infrastructures, roads and public utilities are constructed and the land is made available to farmers for cultivation. The Act also contains regulations to prevent the sale and concentration of land by capitalists. The government believed at the time that this law would be able to stop forest encroachment (Khantawong 1988).

Nonetheless, forests continued to be encroached upon as a means to expand cultivation on the one hand, while still obtaining valuable, exportable forest products on the other. This situation was antagonized by contradictory forest policies formulated during this period. For example, the forest product policy provided for the long-term investment of concessions on a 30-year forest working cycle. At the same time, the forestland use policy concerning degraded forests encouraged farmers to permanently settle in, rather than periodically migrate to, these areas.

**Period 4, Reforestation and the Rise of Community Forests: 1980-1988.** As part of Thailand's Fifth NESDP (1982-1986), surveys of fertile soils in deteriorating forest areas were conducted so that the land could be allocated for the settlement of farmers, once again with the intention of expanding cultivated area. Two important community-based forestry projects also began to take root at this time. Due to growing wood shortages, fast-growing tree plantations were promoted. There were about 26 tree species involved including pine, persian lilac, eucalypt, leucaena, casuarina, acacia, duabanga, acrocarpus, mahogany and teak. Planting areas expanded rapidly from 13 rai in 1966 to almost 31,000 rai by 1985, covering a total area of over 150,000 rai.

Under Thailand's Sixth NESDP (1987-1991), emphasis was placed on reforestation with fast-growing trees under community control in order to increase forest area and promote community development (TDRI 1987).

In addition, one of the Royal Forestry Department's (RFD's) most important programs began, namely, the STK or 'right to farm' certificates (usufruct licenses) granted to squatters in national reserve forest areas. In principle, the STK aimed at halting further forest reserve encroachment near squatter settlements. STK certificates gave farmers a sense of ownership they might not have had otherwise, and an incentive to settle on and invest in the land they occupied. The STK program engages these individuals to work for the RFD to replant forests and maintain standing forests in the STK designated areas that are for agriculture. The program also establishes closer relationships between squatters and the RFD, while providing a base upon which other government agencies can operate complementary development programs. Under the STK program from 1982-1985, national reserve forest under the STK rose from 836,211 rai granted to 78,812 households to 1,625,346 rai among 174,295 households (TDRI 1987).

Based on the forest village projects and STK experiences, a transition took place into collaborative forest management whereby Thailand's forest policy concentrated on collaborating with local communities in the forest management process. Particular policies aimed at assisting communities in forestlands to preserve their environment while still producing an adequate livelihood. A pilot project on community forestry management was undertaken in seven provinces in Northeast Thailand to help villagers experiencing wood shortages to sustain their wood supply resources. Furthermore, under the auspices of the social forest pilot program, projects were initiated that involved local people living in lowland and highland or watershed areas. Finally, a forestry extension system was begun in 10 regional Forest Offices and 100 districts to promote tree planting in rural areas (TDRI 1987).

Reforestation continued to be one main government focus using the village approach, but this was done over a relatively limited area and showed a declining trend during this period. For example, afforestation in forest villages in 1981 totalled 94,713 rai, but by 1985 this rate had fallen to 66,330. A similar pattern existed for reforestation by government agencies in watershed and degraded forests. Surprisingly, concessionaires reforestation remained relatively steady from 69,400 in 1981 to 68,875 in 1985 (a peak was reached in 1983 at 96,569 rai) (TDRI 1987). Overall, the total reforested area over this past decade was substantially less than that deforested in a single year; only 10 percent of the annual rate of natural forest destruction (FAO 1989).

Up to this period, no formal national forestry policy or management strategy existed, only short-lived policies which reflected the changing conditions of the country and needs of the government in terms of economic development. To rectify this situation, a written national forest policy was formulated and approved by the Cabinet on December 3, 1985 and received the support of all relevant agencies. While this policy has 20 specific articles, its first article captures the essence of the policy, namely:

*Long term guidelines for forest management and development should be established to maximize national social and economic benefits and national security, with sufficient measures provided for environmental protection. Emphasis should be placed on harmonized utilization of forest resources and other natural resources.*

Basically, forestry management continued to reflect the government's "best of both world's" theme of desiring socio-economic development and resource use through forestry management on the one hand, while still preserving forests on the other. Public and private sectors together were encouraged to develop and manage the forest area to achieve the objectives of providing perpetual direct and indirect benefits to the country. This written policy, moreover, reduced the earlier 50 percent preservation level of national forest land to 40 percent or about 128 million rai. Of this amount, 15 percent was to be preserved as conservation forest and 25 percent as economic forest. This same 40 percent policy was also stated in the Sixth NESDP (1987-1991), which also included several other forestry objectives as found within the written national forest policy: (1) an increase in forest cover from 29 percent to 40 percent of Thailand's surface area; (2) division of Thailand's forests into two categories: protected forests (goal of 15 percent) and economic or productive forests (goal of 25 percent); (3) a revision of the laws and regulations governing the management of forest lands, especially in relation to private sector initiatives; (4) development of coherent short, medium and long term plans for forest and forest industry development; (5) reform of the forest administration to link it with these plans; (6) identification and introduction of technical innovations designed to boost the productivity of forest operations; and (7) development of a public awareness program to educate and inform people about the importance of forest resources.

Guidelines for the development of natural resources took shape during the Sixth and Seventh NESDPs (1987-1996) which set new directions towards decentralization in the management and administration of natural resources at the local level. These development directions were approved by Cabinet Resolution on 7 February 1988 and have led to a decentralized system of environmental assessment and natural resources management planning at the provincial and district levels. Under these efforts, a Provincial Natural Resources and Environment Management Fund was established to finance a natural resources management program throughout the nation. The program closely resembles the National Rural Development Program, an already successfully proven system of decentralized planning for rural development based on the basic minimum needs (BMN) and quality of life improvement approach with particular attention to poverty alleviation. It is administered by the Ministry of Interior (MOI). Under the program a Provincial Natural Resources and Environment Management Working Group Committee and District Natural Resources Management Working Group Committee were established in every province and district in the country under the Provincial Development Committee with representatives from all relevant RTG departments as members. These working group committees were (and are) required to conduct an environmental management needs assessment according to guidelines developed by the MOI, the National Environment Board and the National Economic and

Social Development Board. Based on these findings, the provinces produced an environmental status report and a planning framework under which district-level planners were required to propose natural resources management projects that addressed local level problems. Subdistrict councils and village committees were to play an active role in the planning process as well.

**Period 5, Logging Ban and Greater People's Participation in Forest Protection: 1989 to the present.** The major landmark of this period was the banning of logging on January 17, 1989, followed by a provision for involving local people in forest protection and conservation. According to this provision, the subdistrict (*tambon*) council selects representatives to work with forest officers in protecting the nearby forest. The RFD was also given a new mandate and restructured under the Royal Decree of October 22, 1992. Under this mandate, changes were made to place an emphasis on extension rather than only preservation activities. Decentralization would then transfer more of the work load to provincial and district levels. Finally, the Royal Forestry Department started working with local communities currently living in conservation forests such as national parks and wildlife sanctuaries. In 1992, for example, a pilot project on buffer zone management was initiated at Huay Khakaeng Wildlife Sanctuary through the collaborative efforts of the RFD and involved NGOs. Also in 1992, the Chiang Rai Regional Forest Office established a joint committee including concerned NGOs and the Office to promote community forestry in Chiang Rai province. In addition to these steps, the Seventh NESDP (1992-1996) changed the percentages of protected versus production forests. Although keeping the 40 percent level, the target percentage of protected conservation forests was increased to 25 percent, while the level for economic, production forests was lowered to 15 percent.

Under the Seventh NESDP, natural resources and the environment were placed under the framework of rural development. The three targets of rural development are to develop the quality of life of every household, to increase income and employment opportunities, and to conserve natural resources and the environment through the participation of local organizations. In order to achieve these objectives, four major guidelines are being followed: (1) improving the rural development administrative system by decentralization to the provincial level; (2) increasing income and employment opportunities in rural areas through the prosperity decentralization program, provincial development project, production and employment decentralization fund, measures on privileges and incentives, credit provisioning, capital mobilization, infrastructure development, and the provincial investment plan; (3) enhancing quality of life of the rural people by encouraging people's participation in the development process, solving sanitary problems, and improving public health service by the prevention and control system; and, (4) developing natural resources and the environment by increasing the role of people's organizations and other local initiatives as well as decentralizing the role of the natural resource and environment administration system (The Government of Thailand 1995).

Local development programs based on people's participation in forest conservation, however, have not run smoothly. Conflicting interests in the management of forest

resources by local people and forestry officials, and even between forestry departments, are evident and form major obstacles to the collaborative management process. As one typical example among many, Ganjanapan (1992) has reported that community forestry in Northern Thailand developed out of communal water management organizations. Community regulations and social structure features then combined to develop forest management practices and beliefs, encouraging sustainable forest use. These local practices, however, are not recognized by local officials or the government, which has caused conflict with officers and outside interests who have greater economic and legal power. Ganjanapan indicated that future development of community forestry depends largely on the legal recognition of customary land tenure and strengthening local organizations as legal bodies with rights to control forest resources. This will enable them to effectively protect their forests against encroachment by outsiders. Alternative economic opportunities for villagers have also reduced the need to use forest products, thus reducing pressure on forest resources.

In summary, Thai forestry policy, both written and unwritten, has evolved to meet the changing socio-economic conditions of the nation. Earlier policies were geared to control and protect the forest as a national resource, while later ones focused more on forestland use and environmental aspects affecting productivity. Moreover, while earlier power rested largely with the Royal Forestry Department in controlling forest preservation and use activities, it is now recognized by the government and public alike that people's participation, decentralized local level planning and community forestry efforts are really the only truly sustainable directions for forestry preservation in the country. Introducing this perspective and norm into a relatively rigid hierarchical administrative system, though, has not come without persistent challenges. As Pragtong (1993) has noted, there is still a need for some adjustments in the work procedure, especially a change in the attitude of field officers when conducting collaborative work with other agencies, NGOs, local specialists and community members. To this should be added greater awareness and skills training in diagnosing community forestry problems, opportunities and their population underpinnings. This is a necessary the first step in creating greater sensitivity in understanding and identifying local community *and* forestry problems along with traditional patterns and practices of resource conservation which can in turn create a more equitable partnership between local forestry officials and community people.

## Community Forestry Today: Problems and Prospiects

Community forestry in Thailand is now grounded in people's participation—getting local populations to plan and execute their own projects on a self-help basis, though with technical assistance being provided by local officials when necessary. Although opinions vary as to what should be included under the term 'community forestry,' it is generally felt to cover all activities which intimately involve local people in forestry such as growing trees on farms, processing forest products at household or small cottage industry levels, establishing local woodlots, etc. The essential characteristic of community forestry in Thailand and elsewhere involves establishing forest areas for

use by communities which are in close association with them. Rules and regulations on the maintenance and utilization of forest areas are laid down based on community consensus. In other words, the community assumes the functions of forest management (Sukhawong 1988; Tingsabadh and Phutaraporn 1988). In addition, effective community forestry management must concern itself with two areas: small industry for which the raw materials come from the forest, and agro-forestry.

After the concept of community forestry was launched in 1991 and decentralized mechanisms for natural resource management were put in place, several major differences and problems arose, and most notably the following (Phimolsathien 1993).

(1) Community forestry as a part of natural resources management required an interdisciplinary systems approach that cuts across traditional, departmental boundaries. To avoid inter-departmental conflicts, most plans and projects addressed single resource issues independently rather than through a coordinated, multisectoral approach.

(2) Provincial planners did not have access to relevant data sources for natural resources management or community forestry. Hence, district projects did not follow guidelines laid down by planners.

(3) Natural resources management and environmental assessment procedures and concepts were poorly understood by local level planners. Projects, therefore, tended to emphasize resource conservation rather than an integrated approach that tackled both rehabilitation and production issues simultaneously.

(4) Inadequate funds, support and contradictory government regulations led to the breakdown of many projects.

(5) Finally, local community and villager understanding of community forestry, natural resources and environmental issues often conflicted with national policy, foresters' conceptions of what should be done, or both. Reforestation projects, for instance, did not adequately consider the needs of the local community or the problems of occupiers who were to be evicted. The choice of tree species was made without reference to villagers and some of the proposed species were unfamiliar to them (Phimolsathien 1993). Consequently, local participation was in most cases was either minimal with the planning process remaining largely top-down in nature (with insufficient attention paid to local needs) or outright conflicts arose between foresters and community members over exactly what approach should be taken.

Rather than remaining as permanent obstacles to the community forestry and natural resource management process, these problems indicated that a decentralized planning program for natural resources management in Thailand was both necessary and timely (Phimolsathien 1993). Moreover, to minimize community forestry conflicts,

Ganjanapan (1992) recommended a set of conditions for successful projects, namely:

(1) community forestry should be a locally initiated forest management system with the aim of protecting the watershed forest;

(2) material benefits from the forests should be perceived as an aspect of overall land management and as an integral part of the subsistence farming system;

(3) community forestry has a cultural and moral basis that underscores collective rights of subsistence which are implemented to respond to the ever-changing nature of outside threats;

(4) local organizations are essential in the realization of moral principles and the continuation of communal community forestry practices; and

(5) future development of community forestry depends largely on the legal recognition of customary land tenure and strengthening of local organizations as legal bodies with rights to control forest resources.

# POPULATION, COMMUNITIES AND FORESTRY

## COMMUNITY USE AND DEPENDENCY ON FORESTS

Forestry professionals and other development personnel can unintentionally take for granted the relationship between communities and the forests in which they live, and this has often been the underlying cause of conflict. Yet this connection is vital; forests contribute to people's health, nutritional and productive well-being and are especially important for the rural poor who may depend on natural resources for many purposes.

In Thailand forests are significant contributors to household food security and financial savings for families living within them. In terms of direct contributions, forest products serve as staple foods, supplementary foods, seasonal foods and as emergency foods in times of economic deprivation. Local people who live near a forest with abundant foods spend less money on food than households who live far away from forests (Saowakontha et al. 1989). In Northeast Thailand, for example, forest food consumption saves households approximately 2,946 baht per year (36 baht = 1 US$). This is a significant amount when compared to the Northeast region's annual per capita income of 3,076 baht (Kachondham, Winichagoon and Tontisirin 1992). Saowakontha et al. (1989), moreover, discovered that food collected from the forest saves about 11.50 baht out of a total of approximately 50 baht per day a household spends for food. Forest foods also contribute to dietary diversity and may improve the quantity and quality of food intake. Seasonal forest foods are also a means whereby rural people can ensure that food is available when agricultural products are not yet ready for harvesting and consumption or reserves are depleted. Indirect contributions include cash income from sales of forest products, fuel, livestock fodder or from being employed to undertake forestry activities. Pei (1987) estimated that the sale of forest products accounted for about 10 percent of household cash income in a Northeastern village.

Thai villagers also do not depend on forests only for food, but also as the means to obtain other resources, e.g., construction materials, medicinal purposes, heating energy, fodder and grazing area, wind- and shelter-breaks. The importance of forests for the local people can be summarized as follows (Korvanich 1988).

*Construction materials.* Forest products are sources of construction materials for houses and shelters. This can include not only wood but also leaves which can be woven or meshed together to form walls and roofs. Information also points out that not uncommonly 50 percent of wood sources are coming from bamboo rather than other tree species (Klaisomboon et al. 1992).

*Medicinal purposes.* Many kinds of herbs, bulbs, roots, barks and leaves from the forest are used as medicines for curing or even saving villagers' lives. The sale of these medicines also brings in essential monetary income to many households.

*Heating energy.* Forests are also sources of fuelwood which is the main source of energy for daily living. Fuelwood scarcity can adversely affect households; for example, health and nutrition may be impaired if foods cannot be cooked, water cannot be boiled, or if women must spend large amounts of time in search of fuelwood instead of performing other important household or economic tasks. One study by Klaisomboon et al. (1992) asked villagers about their perceptions of fuelwood shortages in the future and their ideas about how to solve this problem. The majority agreed that there would be a problem; to solve it in the short-term, they would have to turn to other energy sources such as electricity or gas (which would lower their monetary savings), while in the medium- to long-term reforestation and farm forestry would need to be established whereby fuelwood production could be increased. In the meantime, even though electricity and gas are available as alternative fuel supplies, the people still rely on fuelwood and charcoal.

*Fodder and grazing areas.* Cattle and other domestic animals are valuable sources of food and income for communities. Forests serve as areas where such animals can obtain their own foods such as fruits, leaves, barks, roots and grasses. Alternatively these foods can be gathered and brought back for the animals to consume. Forests also provide valuable cover for animals and their keepers.

*Windbreak or shelterbreak.* Forests protect shelters and settlements from strong winds which can damage buildings and other material properties, especially in the hot dry season. To repair such damage, community members would either need to purchase additional building materials or, more commonly, obtain them from the forest.

Two trends appear in the literature concerning people's dependency on forest/tree resources in Thailand's current climate of restricted forest use. The first indicates that under conditions whereby forests are closed for public (community, industry) use by government means and before forest resources are depleted, local people's dependence upon forest resources actually increases. For example, beginning in late 1988 forest reserves were closed off and a logging ban was imposed by the government in January 1989. After these events, Saowakontha et al. (1989) found that for villagers, the forest still remained an important resource. Moreover, decreases in cultivation and logging forced the villagers to become even more dependent on forest resources, since they did not have the means to earn greater income to buy commodities such as food.

The second trend rests on people's responses when the forest itself becomes depleted and the dependency relationship is broken. In Northern Thailand, for example, socio-economic and political development has created conditions where villagers have become extremely dependent upon cash incomes as forest resources have diminished. They now spend over three-quarters of their total income on food, which at that time suggested a level of poverty well above the national average (Gammelgaard 1986).

## Linkages Between Population and Forestry

### Macro-Level

The relationship between Thailand's socio-economic development, population and environmental considerations is well-recognized and beyond controversy. Nonetheless, though population pressure and deforestation are quite pronounced in Thailand, the literature is heavily focused on deforestation; community forestry and its organization; conflicts between communities, forestry officials and capitalists; and how the conflicts are, or should be, solved. Studies on significant population variables—such as geographic distribution, population composition (e.g., age and sex), family formation, rural-urban density, migration streams, growth rate, age structure, dependency ratio and other socio-economic characteristics—and their impacts on land use, forestry and deforestation are extremely rare.

Current forest/environmental research considers population only in terms of population size, growth and density. Even here differences of opinion exist as to what is the actual causal relationship between population change and deforestation (Marquette and Bilsborrow 1994). This controversy, moreover, limits the ability to incorporate population variables into forestry policies, plans and programs. On the one hand, for example, Panayoutou and Sungsuwan (1989) developed and applied an econometric function for defining forest cover and deforestation between 1960 and 1988 for Northeastern Thailand. Demand factors due to logging, fuelwood, agriculture and infrastructure development (e.g., roads, irrigation) were estimated through individual demand functions that took into account population growth and density. For instance, fuelwood demand was estimated as a function of fuelwood collection costs, population growth and density, forest accessibility, and the opportunity cost of labor. The overall deforestation function accounted for all these estimated demand factors, their interaction and wood prices. Using demographic, agricultural and land use data for the 16 provinces that comprise Northeastern Thailand, Panayoutou and Sungsuwan then applied regression analysis to estimate the overall deforestation function (and its constituent demand functions) for the 1960-1988 period. Their findings indicated that population growth and density were the single most important factors contributing to deforestation in Northeast Thailand. Population growth and density had this significant impact mainly by leading to greater demands for agricultural land. Unfortunately, they did not explain how population growth and density actually affect land degradation and deforestation, to what extent, and what if any process can be seen as arising from this relationship.

Moreover, this simple causal relationship between population growth and deforestation in Thailand did not include a temporal perspective. As a result, it is being challenged by the assumption that large-scale deforestation began prior to rapid population growth, primarily as a result of government policies that encouraged wide-scale commercial exploitation of forest resources (Midas Agronomics Company 1991; Onchan 1987; Pinthong 1991; Suhrke 1993). For instance, another study found that community economic structure and organization are more important than the number of people

living around the forests (Sato 1994). Serious threats to forests stemmed from land clearing for cash crop production, which promoted more migration into the area. In addition, the study found that the local population size does not explain why some forests survive while others disappear. Population pressure on forests therefore has to be analyzed by studying the linkages between local economies, those of the region and nation, as well as local consumption patterns. Ganjanapan (1992) and Sato (1994) also report that migration into forested areas for cash crop production stemmed from urban-based demands which first led to the overuse of customary agricultural lands, then migration into more marginal lands and finally into forest areas leading to their subsequent degradation. In the final stage, out-migration occurs in communities with high rates of land degradation and deforestation (Hutanuvatre et al. 1989).

The concept of "environmental refugees" or environmentally-induced out-migration (due to land degradation, drought and deforestation) has also been considered in developing countries including Thailand (Marquette and Bilsborrow 1994). Kavanagh and Lonergan (1992) reviewed the existing literature on such out-migration in Southeast Asia and noted that focusing on the environment as a cause of population displacement has been speculative and has relied upon anecdotal information. They indicated that the determinants of out-migration are multi-causal and it is difficult to distinguish between impoverishment, environmental degradation and insecurity as causes of population displacement. They concluded with recommendation that the impact of environmental degradation on population movements must be considered within a framework that addresses impoverishment and security issues. Suhrke (1993) also embraced a specific descriptive view of the relationship between environmental degradation and out-migration in Northeast Thailand, India, the Sahel and Guatemala. Based on these country cases, she suggested a view in which patterns of development and population pressure or "demography and political economy" were seen as the ultimate causes of environmental degradation and therefore environmentally-induced out-migration. She concluded that it might be most useful to consider environmental degradation as one element in a complex chain of factors that lead to out-migration.

### Micro-Level

The causal link between population and environment in Thailand today is clouded further by a lack of attention to basic population data. Though data on some variables have been collected—such as age structure, population size, migration, income and occupational distribution, and community organization—they were only collected to give a descriptive profile of the communities or areas under study and not as analytical tools for understanding the relationship between population, deforestation and environmental degradation especially over time.

The major exception to this is level of education. Phantumvanit and Panayotou (1990) found that education is a significant factor in both agricultural and wage income; it enables better management decisions in farming and more access to off-farm employment which is a limiting factor especially in rural areas. This is important since raising

off-farm income (obtained through non-agricultural skills) is one strong determinant which removes pressures on the land to supply needed commodities. Those who have skills related to non-farm activities are less likely to undertake deforestation practices, because these people can find other jobs to earn more income to replace their dependency on forests. Level of education also includes non-formal training, particularly in the form of agricultural training programs, which can lead to better land use decision-making (Klaisomboon et al. 1992). In households where their heads received such training, they could use new information on alternative land use to manipulate the farming system to make it more productive yet environmentally sound.

## How Population Variables Should be Addressed

In forestry and environmental planning, population variables should not be looked at as social or demographic profile information only, though this has been the case for Thailand thus far which explains to an extent why their consideration is absent from forestry training programs as well as policy-making and planning. Rather, they should be able to indicate linkages (direct and indirect) between those variables and land and forestry use, as well as whether or not they affect land and forest degradation, to what extent especially over time, and how.

What studies of population and community forestry need most strongly is a dynamic, time series approach to understand the actual interaction between population variables and community forestry and thereby integrate basic population data into forestry use planning. For example, changes in community and household demographic variables (growth, size, age-sex composition) should be studied over time in relation to land use and deforestation to determine whether or not population pressure changes are actually influencing environmental stability now versus in the past. Moreover, it is often assumed that population growth is one major determinant of environmental degradation, and reducing population growth rates by launching more effective development programs aimed at rural poverty alleviation is one effective measure. In Thailand's case, though, the population growth rate has declined over time due to an effective national family planning program. What now is the real issue is that the number of births added each year (over 500,000) is still a problem for national social and economic development planning particularly in terms of maintaining the environment and existing resources (UNFPA 1995).

Family formation is another important population consideration. It includes such aspects as age at marriage, post-nuptial residence, age at having first and second children, family planning, and inheritance patterns which should be investigated in relation to land tenure, land fragmentation, migration as well as land and forest use. For instance, while large families in the past may have been the norm, and started the population-environment pressure process, today they have changed to a more nuclear structure. This may reduce pressures on the environment especially under conditions where some, or most, of the family members migrate out at a certain age.

Regarding migration, considerations must be made in terms of the relationship between migration (both in- and out-), land, forestry use and degradation particularly over time and with regards to gender and occupational alternatives. Migration can serve both positive and negative purposes with regards to community forestry conservation, and an accurate understanding of each of its dimensions is crucial.

As for occupations, information about what occupations are held by community members, how they have changed over time, division of labor, and what ones are destructive or non-destructive to the environment will give insights into what options are available for reducing population-environment pressures.

Gender roles are also important since they give indications about who is utilizing what environmental resources and for what purposes, how these patterns have changed over time, and who can best serve as community forestry conservationists. For instance, in community forests in Northern Thailand, the traditional pattern included a clear-cut division of labor between men and women. Women were responsible for child care, obtaining foods in and around the village and their preparation, obtaining water and firewood, and collecting forest products for sale. Men were responsible for obtaining foods (animal, plants) deep in the forest, clearing the land, ploughing and harrowing rice fields, tending cattle and livestock, cutting trees and constructing houses, basket weaving, as well as selling forest products (Gammelgaard 1986). Today, however, this relatively rigid traditional division of labor pattern has broken down. With the advent of a cash economy, men's and women's roles are more flexible since more manpower is needed and gender roles have diversified in order to all tasks to be done. In relations to the land, for instance, men and women now share work together; men are also assisting more in child care (Gammelgaard 1986).

Finally ethnicity, especially with regards to gender roles and division of labor, is another important population variable which must be studied with regards to land use and conservation. As a case in point, two of Northern Thailand's largest hilltribe ethnic groups are the Karen and Lawa. These groups are known to conserve the environment. Women make the fire breakers when clearing new land, and they are involved in maintaining water resources in the community. Women also take part in community forestry projects which are becoming more widespread among the hilltribes. At the household level, the women plant vegetables, herbs and spices in the rice fields for their family's consumption. Although women have not formed a formal forest conservation group in hilltribe communities with regards to environmental conservation, they are the ones who directly use and benefit from the natural resources. At this time, though, no known initiative to establish women's environmental groups has developed (Vaddhanaphuti, Leepreecha and Butt 1993).

In summary, the customary population variables associated with the environment (e.g., geographic distribution, rural-urban density, growth rate) are not the only relevant or crucial variables that must be considered in-depth in assessing problems related to deforestation and pressure on forestry resources. Those mentioned above are also

important considerations that need to be integrated into training programs for forestry officials in order to promote better land-use planning and more sustainable management and use of forest and tree resources. This will allow foresters to improve their critical understanding of what population issues are relevant, and those which are not, in order to make their judgements, decisions and behaviors more rational and build more sensitive and equitable partnerships in local level environmental management.

# People and Community Forests in Northern Thailand: A Case Study

## Background and Methodology

This section presents an in-depth case study from Northern Thailand to illustrate the relationship between a population and its forest environment over time. It provides a practical perspective about how community members view the forest and its resources within the context of their daily lives and livelihoods, what population variables have played a role in their past and current economic and environmental practices, as well as how and why these practices have changed to become more in line with sustainable environmental goals. It illustrates, especially, how population variables come together to impact upon the environment, and vice versa; what household/community survival strategies arise and how they develop; and the process of how successful community participation for community forestry arises.

This case study centers on a community in Chiangrai province, Northern Thailand, known as Baan Dawn (a pseudonym). This community was chosen because government officials categorized it as a case of successful community forestry. As a result, identifying the mechanism(s) that led to this success could benefit other communities in planning and managing their own community forestry initiatives. In addition, most Baan Dawn community members had migrated to this area from provinces located in Northeast Thailand where deforestation is heavy. Several important population features associated this Northeastern migrant group are also quite evident, namely, a family size that is large compared to Northern Thai families and where in-migration has led to population growth. It is therefore possible to investigate the relationship between these population features and their impacts on forests and their resources. Finally, Baan Dawn is a relatively young community since it was established only 30 years ago. Consequently, it was possible to trace the community's history, identify important population and environmental changes and their causes, and its interrelationship with land and forest use.

To obtain important information about Baan Dawn, this study used the Rapid Rural Appraisal approach which included team members from a variety of disciplines: a demographic anthropologist, a nutritional anthropologist, a geographer and a demographer, along with one research assistant who had conducted his thesis on community forest fires. The study also had three consultants whose specialities are in the areas of demography, social forestry and human ecology.

During data collection, basic qualitative methods (i.e., participant-observation, in-depth interviews, focus group discussions) were used throughout the study. One Master's degree student in applied anthropology, who was able to converse in the Northeastern Thai dialect, served as the study's research assistant. He lived in Baan Dawn for six consecutive months to learn about community members' lives and livelihoods, including forestry activities, as well as to collect relevant data for analyzing the interplay

between population, forest and land use. Overall, the study encompassed eight data collection phases.

(1) After the Baan Dawn community was identified, the research team introduced themselves to community members and built the rapport needed to conduct the study.

(2) The research assistant then conducted a household census and mapped the community in order to familiarize himself with the community people as well as with the community's geographical characteristics.

(3) The household census and maps were also analyzed to provide information on the size, age and sex composition of community members, housing settlement patterns and physical environmental features. The information also provided the target frame to differentiate families with and without out-migrants for comparison.

(4) In-depth interviews were conducted by the research assistant with key Baan Dawn community members to obtain information on population processes, family structure, formation and inheritance patterns, economic organization and opportunities, education, household/community survival strategies, land and forest use, the community forestry development process, and other relevant information.

(5) Research team members held monthly discussions with the research assistant concerning major issues that arose during the fieldwork period. These discussions centered on clarifying information, deciding upon what issues should be pursued further, and what meanings could be understood from the information collected thus far.

(6) Fieldnotes were taken daily by the field assistant which served as an additional data source for field team members concerning the community as well as the field assistant's own reflections and capabilities in living and working with the community.

(7) At the project's end, the research team spent one week using the results of preliminary analyses as a guideline for conducting focus group sessions with community members. These sessions were conducted to check, elucidate, clarify and wrap-up the main points (or highlights) of the case study.

(8) During data analysis, the research team identified empirical evidence concerning the people's own perceptions of the signs of deforestation. Since insufficient information was previously collected to further expand on this knowledge, the research team decided to return to Baan Dawn and learn more about this community's indigenous "early warning system" for deforestation so that these signs could possibly be used by other communities in Thailand and in other countries within the region.

## Community Profile

### Community Life and Migration History

Baan Dawn is located in the uppermost part of Northern Thailand, an area that shares common borders with Myanmar and Laos and is very close to Southern China. Northern Thailand is a mountainous region with narrow river valleys formed by the tributaries of the Chao Phraya river. Rice, forestry and fruit cultivation are major industries. The valleys are inhabited by the Thai people, but the mountains contain ethnically distinct tribal peoples. Since the beginning of recorded history, Northern Thailand has supported itself on rice cultivation, and the society has revolved around farming families, often considered the 'backbone' of the country. Despite the availability of modern farming technologies, rural life is still typically that of small-scale farming families, with farming being done with traditional techniques. Work is usually undertaken by hand or with a water buffalo, under the hot sun, and shared by the entire family, who consume the products from their own fields, while selling any surplus at local markets. For those who can afford it, televisions, radios and motorcycles are common possessions. Life is centered in the rice fields and around the community Buddhist temple. More often than not, neighbors are also extended family members or other relatives. This is the life pattern of the majority of rural Northerners, who often have only a primary education.

Baan Dawn community is located in a watershed area. Over 90 percent of the community's residents grow rice, corn and tapioca, while a few families raise cattle. Most of the villagers living in the community migrated from several Northeastern Thai provinces approximately 30 years ago. At that time, the Northeast was experiencing successive droughts and famines over a 3 to 4 year period. Though they had land on which to grow rice and other cash crops, they could not produce enough to live on. One mechanism for them to cope with this problem was to migrate out of the Northeast region in search of a better place to live. Some moved to urban areas to find other ways of earning a living. Others moved to places where the land was still fertile and there was enough cultivatable area for them to work on. Another migration stream moved to the Northern region, particularly to Chiangrai province. Although they live in Northern Thailand, community members continue to be Northeastern Thai in culture and tradition. The Northeastern Thai dialect (Thai-Lao) is spoken daily, though community members are also fluent in Central and Northern Thai which is used with government officials.

### Population Structure and the Environment

Thirty years ago, Baan Dawn found itself in an area covered by forests. As one community member noted, *It was just completely different. The Northeast was so open, but the North was full of forests and big trees.* But although forests surrounded Baan Dawn three decades ago, currently they are limited to mountainous areas only. Moreover, the community's population has grown over time due to births and in-migration.

While there were only a few families 30 years ago, at the time of the study Baan Dawn contained about 150 families and 772 people with males outnumbering females. The average family contained three children.

But times changed. About 10 years ago, Baan Dawn began to lose community members, since they migrated out when the area was declared a national reserved forest in 1984. With this designation, the amount of resources that families could use to ensure their survival was severely restricted. Since several families had lost their resource security, they moved away to find other jobs so they could earn cash and send it home to help their families. Women migrated out earlier than men, which is not surprising since in Thailand in general, women tend to migrate at younger ages than men since they stop schooling, enter the labor force, and marry at younger ages than men.

## Family Structure and Inheritance Patterns

Baan Dawn families were mainly nuclear families, with no more than two generations living in the same household, though several related nuclear families might live in the same housing compound. Matrilocal residence was also widely practiced in this area, where a husband moved to live with his wife's family after marriage and helped to care for her parents until their death or the marriage of a younger sister. Though individual families tended to live separately, they shared their work and the decisions it involved, as well as providing needed support during times of need. As a result, decisions to use, or conserve, forest resources were made on a communal basis, which also helped to set the stage for future community forestry actions by Baan Dawn villagers.

When the time came for a family to divide its properties through inheritance, usually land and other assets were divided equally among all children without regard to gender. However according to traditional practices, the daughter and her spouse who took care of the parents in their old age would inherit a larger portion of the properties than other siblings. Their inheritance included their own portion (which is divided equally among all children) plus the portion belonging to the parents. This "reward" of additional property has been a part of the traditional old age security system found in both Northern and Northeastern Thailand. As a result, the tendency was for properties, including those containing forested land, to be concentrated more in the hands of women and their husbands, who could be considered key resource holders and decision-makers, and thus important target persons for any forest development programs.

This more recent inheritance pattern differs somewhat from the original matrilineal practice found especially in Northern Thailand. In this more traditional pattern, women who could trace their ancestory back to a common female ancestor formed a lineage (matrilineage). Every lineage member was entitled to use the lineage's land for their own living. However, no one could sell nor rent the land to other people and land could not be divided into pieces for individual use. This ideology can be considered as one of forest/environmental protection.

Today however, several conditions exist that make it difficult for a family to divide its property equally among its children. First, the amount of land owned by families is becoming smaller and smaller, thus its division can mean that children inherit insignificant amounts of land to earn a living or obtain resources. Second, land quality is deteriorating as usage is maximized, particularly when the land area is already small. Finally, the reduced size of inherited land, or access to communal lineage land, urges parents to try to accumulate even more land so to give to their children. Alternatively, they encourage their children (including girls) to migrate out of the community to other areas, for jobs in cities or, less frequently, to gain an education in lieu of inheriting property. While this out-migration may at first appear to reduce the population pressure on the land, what actually occurs is that the property is still used (or overused) as it is accumulated by the other remaining families in the community.

## Education

Most of the people in Baan Dawn's parental generation (aged 30+ years) have completed Grade 4, while younger generations (aged 20 years and below) have finished Grade 6 which is the compulsory level of schooling in Thailand. A gender disparity with regards to education is not clearly seen in Baan Dawn. Educational decisions are usually made by the individual child based on his or her own intentions and willingness; parents do not encourage or force their children to continue with their schooling. Nonetheless, boys appear to have an advantage over girls if a higher educational institution is located in a nearby town or another location close to the community. The reason for this is not because of a gender preference favoring educated males. Rather, it is because it is socially and culturally not considered safe nor convenient for girls to travel to and from home and school especially if they go alone. As a result, girls less frequently leave the community to gain a higher education, and thus they are more likely to own and inherit land/forest resources from their parents, if these are available.

## Forest Ecology

Baan Dawn contains three clustered areas: watershed, lowland and upland. Houses are clustered in each area, and they are surrounded by either rice fields or orchards. The forest, which is situated on the outer side of the community, can be categorized as follows.

(1) ***Watershed forest***, consisting of 700 rai of land (one rai equals approximately one-quarter of an acre), is composed of large trees and a bamboo forest. In earlier times, bamboo forests were not a common sight because of the greater coverage of large trees. In the watershed forest, the felling of trees is not allowed, but animal hunting is permitted. Animals living in this area include the flying lemur, squirrels, cherrotains, palm civit, etc.

(2) ***Monastery forest*** consists of 300 rai of land including 25 rai that belongs to the local monastery. In 1993, Baan Dawn villagers asked for this parcel of land to be separated from the National Reserve Forest as designated by the Department of Forestry. The monastery forest is more abundant than the watershed forest since neither the felling of trees nor animal hunting is allowed. Community members call this area *Saan-Pa-Yang* due to the large number of Yang (rubber) trees. Animals that live in this area include squirrels, cherrotain, flying lemurs, the palm civet, monkeys, wild fowl and wild boar. Local people living in the area, though, usually set fires to hunt wild boar which results in yearly forest fires. At present a fire protection alley surrounds the temple to protect it from fires that become uncontrollable.

(3) ***Permanent community forest*** comprises 400 rai of land and was established to increase the amount of reserve forest area. The felling of trees is prohibited and they are allowed to grow naturally. However, close care is needed to prevent tree felling.

(4) ***Utilitarian community forest,*** which cover 300 rai of land, is an area in which permission was granted by the Community Forestry Committee for tree felling and the gathering of forest products. Wild goods such as bamboo shoots, mushrooms and other products however cannot be sold and can only be used for home-consumption. The trees in this area can be used continuously. However, the rule is that for every tree that is cut down for house repairs or construction, ten trees must be planted to replace it and given three years of care.

## Community Population and Environmental Changes

By looking at Baan Dawn's development and the strategies its families have used to ensure their survival, a picture emerges of how the community and its resource use has changed over time including many of the population and environmental forces that have come into play.

### Period 1: New Settlement - A Time of Plenty (1967-1977)

When the community's founding families moved from the Northeast to settle in Baan Dawn, the area was still heavily forested. Wetland farms were scarce and what existed were owned by the local Northern Thai people. During this period, the migrants were forced to manually clear unowned, marginal land in order to raise upland dry rice. The community's population size was small compared to the large forested area. As a result, families adopted two main strategies to maximize land use for agriculture: (1) encouraging relatives, siblings and neighbors to move in and settle in the area; and (2) being motivated to have a large family size.

These two strategies were based on several assumptions. First, it was not uncommon that children died in infancy thus leading to high infant and child mortality rates. Consequently, having more children increased the family's labor force and work could be

done faster and more efficiently. In addition, living in a large community was believed to be safer since the community would have more people to help guard land and properties against outside intruders. Moreover, a larger population would make it easier to request infrastructural improvements from the government including schools, a health post, roads, electricity and so forth.

When the migrants first arrived in the area, they were roughly the same age, and thus their population age structure was concentrated. Those who migrated from their natal villages in Northeastern Thailand were mainly working age people with low economic status. Some, usually men, came in a group, leaving their families behind. Their intention was to see if they could survive in the new area, and if so, other families members would soon join them. Several of the migrants, however, also met their spouses in the local area and were married in Baan Dawn. In some cases, though, entire families migrated together and helped each other in establishing their families and working lives.

At this time, both men and women had to work hard to cultivate the land, gather food and firewood from the forest. Their lives depended heavily on the forest and much time was spent manually transforming it into arable land. Community members thought of the forest as their "supermarket" which offered various types of fresh and nutritious foods, housing materials, fuel and medicinal plants. The amount of land used by each family was determined by the number and work capacity of family members. Those that could afford the time and energy to work on a large plot of land would secure a larger portion. Consequently, this served as a direct incentive for large families and the perceived benefit of having many children. This was facilitated by the fact that family planning services were not yet accessible and family planning methods were not widely practiced. The familial need for more members was also aided by a low age at marriage since women at that time had no alternative after their four years of compulsory schooling. Additional family members by marriage, as well as birth, were thus absorbed into the family developmental cycle quite early.

During this period, no women were appointed as community leaders nor members of any informal community groups. Family and work responsibilities did not allow them the time to participate in community activities. Moreover, there was a clear division of labor based on gender, in that all activities and key household decisions within the confines of the home (or the "domestic domain") were viewed by community members as the responsibility of women. Alternatively, all activities and decisions outside the domestic domain were considered to be male responsibilities. As a result, while a woman and her family owned their land through inheritance from her parents, decisions about its use (since it fell outside the domestic domain) rested with her husband.

### Period 2: Extra-Community Pressures - A Vanishing Frontier (1977-1987)

In Period 2, macro-level forces originating outside of the community began putting great pressure on available resources. In particular, trees fell in great numbers due to

the needs of logging industries, agricultural technologies, and rising market demands for cash crops that could be grown on cleared land. At the micro-level, the population was shifting. People from the Northeast were still moving into the area, but this in-migration did not cause high community-induced environmental pressures, because indigenous working age people from Northern Thailand were moving out to urban areas such as Bangkok and other large cities in search of manufacturing, service and industrial jobs, leaving their parents behind. The parents, in turn, usually rented their rice lands out to those who needed them. As a result, the Northeastern migrants expanded their agricultural lands through renting (rather than claiming virgin forested lands) and were able to operate both upland dry rice and lowland wet rice farms.

Logging industries also encouraged people to move into the area, and community members were hired to work in the forest on logging crews. Consequently, the community's economy boomed due to this influx of outside capital, and community members expanded Baan Dawn's infrastructure by requesting from the government a school, health station and adequate roads, though electricity and a community water supply were more recently obtained.

Since land was abundant for cultivation, community members saw no reason to limit their family size, though an average decline from 6 children to 4 children became evident due to the increased access and availability of family planning services.

### Period 3: Community Forestry - Preserving What is Left (1987-1996)

In 1984, the government announced that the forest would be closed, though it did not affect the research community until 1986-87. More importantly, community members agreed with the policy. However, they felt that, *It is good, but it is too late to save the forest. It is already gone.*

The forestry policy had an impact on the population structure and the life of the Baan Dawn's people. Smaller landholdings and the need for cash to raise families helped to reduce the size of families from six children in Period 1 to three children in Period 3. The younger working age group had a tendency to move out and get jobs outside the community in order to earn money for their families. If they could work and earn money close to Baan Dawn, they would remain; but this was becoming increasingly difficult. Those who migrated out tended to be working age men and women with or without children. As a result, some families became short of farm labor, being comprised only of the elderly and young children who remained in the community. Working age individuals usually migrated out either seasonally or temporarily, though some moved out permanently after finding a steady job and settling down elsewhere. As a result, the traditional fabric of family and community life was rapidly deteriorating.

One important question at this point is, What does a family do if there are no more laborers to provide for its labor needs? To solve this problem, community members

adopted two survival strategies. First, family members who migrated out were encouraged to return home to help with farm work during planting and harvesting seasons. They thus became seasonal migrants to the community and their families. Second, those who moved out sent money back to their families so that their parents could hire other people to work on the farm. In this case, family participation in farming changed from one that was earlier based on labor to one that was now based on cash.

What arose was a temporal shift in the development of Baan Dawn and its members. While 30 years ago the original migrants moved into the area to escape the pressures of land degradation, drought and famine in Northeastern Thailand, their children were also forced to move out of their natal Northern Thai community due to limited access to forests, land degradation and scarcity which inhibited agriculture, increased landlessness and the need for cash to purchase material items and to pay other expenses. These children could therefore no longer work in and around the community and earn enough money to support themselves and their families. Obtaining more land was also not an option, since it was scarce and expensive.

The basic problem facing Baan Dawn is resource shortage and the lack of a resource recovery strategy. In the past, people could earn an adequate income from agriculture and collecting forest products that they could sell. As a result, they could accumulate surplus "wealth" that could be used during difficult economic times. Presently however, with land scarcity and a closed forest, community members do not have a reliable means to accumulate additional resources. They only have enough money to live on a day-by-day basis, and most are renting land from Northern Thai people.

In terms of migration, therefore, there are at least three major factors promoting out-migration. The first is socio-economic conditions whereby the money earned by migrants has become the economic life line maintaining community members' lives. Second, social support and networking is important in encouraging working age community members to migrate. Friends and relatives at the place of destination (usually a large city) provide job information, places to live and other types of support for new migrants which makes the decision to move easier and faster. Finally, while in the past marriage or education were two main reasons for community out-migration, they are now overshadowed by the immediate need to earn money. Family and community household survival strategies are thus placing a heavy emphasis on short-term economic gains rather than the longer-term growth and stability that could arise from higher education. The social and economic safety nets that formerly existed in the community have become torn, thus placing community members in a very unstable economic, social and environmental position.

## Lessons Learned and Community Actions

### Optimum Population and Carrying Capacity

Baan Dawn's situation now is one in which in-migration has ceased (since 1989) and the population has reached the saturation point where the carrying capacity of the land and forest can no longer allow for additional people. Out-migration thus becomes an adaptive response to limited environmental conditions. Moreover, the concept of "optimum population" is relevant here and it is indigenously recognized by community members. In many instances, community members noted that there is enough space for 3 to 4 families to build houses. However, because there is no more land for cultivation, no more people can move into the community. For community members therefore, perceptions of optimum population and carrying capacity do not rest on a consideration of population density, rather they relate to the amount of cultivatable land available per person or family.

### A Deforestation Early Warning System

Baan Dawn residents also remember what happened to them in Northeast Thailand that eventually forced them to move to Northern Thailand; particularly the effects deforestation has had on their native Northeastern region. This grim reminder has helped them to see that the same happening could occur in their new home, and they have realized and kept watch for several warning signs that help them gauge the deforestation situation in their community. Such indigenous warning signs, many of which are retrospective in nature, can be summarized as follows in question form.

(1) Is the community surrounded by forest as it was in the past, or is the forest isolated such as on the sides of mountains?

(2) Has there been a change in weather; that is, is the dry season longer and hotter? In the past, did it seem that rain was more plentiful and the weather was cooler?

(3) Are droughts and water shortages becoming a problem particularly in the summertime? Can waterfalls still be heard (in the watershed area) all year around as in the past?

(4) Are aquatic resources (fish) appearing to decline in number?

(5) Has the number of wild animals apparently decreased? Can they still be heard regularly?

(6) Is the wind strong now?

(7) Are forest fires more frequent and severe? Does the wind seem to help feed them? Do men and women have to spend more of their time fighting fires?

(8) Are forest food sources becoming harder to find?

(9) Is it necessary to spend more money on fertilizers, particularly those that used to be obtained from the forest?

(10) Have cropping patterns changed? Is it necessary to plant crops that do not need much water?

(11) Is it common for community members to leave and take jobs elsewhere, often leaving the elderly and young children behind?

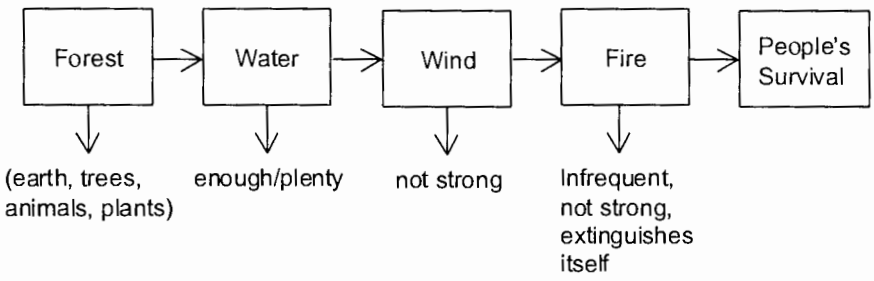
These questions form the heart of what community members have asked themselves about their changing environmental situation. Since these questions and related signs have been indigenously developed and recognized, they have the potential for incorporation into a forest land management training program, particularly one that calls upon participatory training methods. They could be a valuable tool for helping community members to assess their current situation, analyze what causes exist, and then what actions can be taken to improve their situation. For example, Baan Dawn community members have seen these signs and have become aware of the growing relationship between deforestation and other impacts. To correct several of these signs, community members have begun to protect and preserve the forest using community forestry as the guiding principle.

But why has this early warning system become a part of the community? One reason is that it equates with the indigenous system of understanding regarding people's survival. This system encompasses the balance of four humours which is thought to promote health and life: earth (*din*), water (*nam*), wind (*lom*) and fire (*fai*). This system is widespread throughout Thailand and several other Asian countries and it is the basic concept behind disease etiology. The human body is composed of these four humours, and a person should have the right proportion of each humour to be healthy. An imbalance in the human body causes illness or death.

What is occurring is that this same belief system is being used by community members to equate not only human health but also the health of the physical environment, in particular that of the forest and its surroundings, and its relationship to the human population. For instance, in the watershed area, the people realize the balanced relationship between water supply, forest cover and amount of environmental rainfall as shown below. Disruptions or imbalances in either water supply or forest cover lead to adverse environmental impacts.

| **Water** | **Forest** | **Environment** |
|---|---|---|
| Waterfall (*nam tok*) | Dense forest | Plenty of rain |
| Water flows slowly (*nam rin*) | Sparse forest | Sparse rainfall |
| Water drop (*nam yod*) | Deforestation | Long/hot summer (drought) |

They also perceive the following relationship based on humoural theory wherein an imbalance of the "environmental humours" of forest (earth), water, wind and fire threatens the survival of community members and the community as a whole. Environmental imbalances in any of these humours can lead to such population problems as out-migration of family members, economic hardship, family and community structure instability, changes in family and community organization, norms, values, etc. Many of these concerns, both in terms of the quality of the environmental humours and related population problems, are also embodied in the indigenous early warning system above.




## Community Forestry

Intuitively using the above humoural framework - or explanatory model - the villagers have come to realize the extent to which the forest and its biodiversity has been degraded, thus deteriorating the watershed and leading to water shortages in particular. As a result, they have adopted community forestry as a locally initiated forest management system with the aim of protecting the watershed forest and restoring the natural environment. They demarcated the community forest area and established rules and regulations for using the forest. They also appointed a village committee, known as the Community Forest Committee, to guard and care for the forest. This committee was first established in 1991 and comprised 15 members, all of whom were men. Since 1995 however, women have become active in the committee by providing new ideas and establishing rules and regulations.

In 1991, 300 rai of land was designated by the Community Forestry Committee as a "free from hunting" forest and it was conserved by the villages and Buddhist monks.

They constructed a nursery in the temple to produce seedlings. In 1992, a community forest management plan was adopted which classified the forest into different types: watershed forest (700 rai), permanent community forest (500 rai), and multipurpose community forest (700-1,000 rai). The Community Forest Committee and the village head also enacted rules and regulations concerning forest use under the supervision. These are as follows:

(1) Three logs from multipurpose trees would be allocated per family for house construction.

(2) Families who cut trees for house construction must plant at least 10 trees per each cut tree and care for them for at least 1 year.

(3) Only community members who have their house registered can benefit from the use of community forest trees.

(4) If persons who are not part of the community set fire to the community forest, they will be arrested by the Community Forest Committee and fined 10,000 baht.

(5) If persons from outside the community cut down trees in the community forest, they will be arrested and fined 1,000 baht per felled tree.

(6) Encroachment by non-villagers is punishable by a fine of 5,000 baht.

(7) For cultivated areas near the community forest, if they are to be burned they must be surrounded by 4 meter wide fire control strips.

(8) Community members who cut down trees for making charcoal must pay 100 baht per tree.

(9) Persons outside the community are forbidden to cut down community forest trees.

(10) Community members and persons outside the community are forbidden to sell bamboo from the forest.

(11) Persons outside the community are prohibited from harvesting bamboo shoots. For community members, only harvesting for home consumption is allowed. The bamboo shoots cannot be sold.

## LESSONS FROM THE CASE STUDY

The case study of Baan Dawn community, a fairly young village that has undergone tremendous social and environmental changes in only 30 years, highlights the importance of a time series approach for understanding population and community change and, more importantly, how families and communities adapt to rapid structural and environmental transformations.

While the case study can be analyzed at several different levels, it highlights in particular that one of the most useful concepts for integration into population and community forestry training programs is the household/community survival strategy, or the means by which households and communities adapt new behaviors and organizational arrangements in order to deal with significant population, politico-economic and environmental changes over time. Originally the concept was developed to reflect demographic responses to intensified land use and changing land ownership patterns (Bilsborrow and DeLargy 1991). It gave an "after the fact" perspective containing five key components:

(1) A shift from traditional crops to cash crops on small plots.

(2) A shift from crops to livestock.

(3) A recourse to local off-farm employment.

(4) One or more members of the household migrate either seasonally or permanently to earn incomes to help sustain the family in the community of origin.

(5) The entire family moves, either to new agricultural lands or to urban areas, both of which have environmental effects.

The case study here, and its diachronic perspective, offers us the chance to expand this framework to more clearly see the interrelationship between population and environmental change over time and what specific population variables need special consideration. For Baan Dawn, the household survival strategy contains two parts which correspond to a community's development, namely, expansion and contraction.

### Community Expansion (Reliance on Forest Resource Utilization)

(1) Reliance on labor-increasing strategies in order to maximize the obtainment and utilization of land/forest resources and to increase community size, e.g., increased fertility, encouragement of in-migration, extended family structure;

such strategies may be adopted either in response to high infant and maternal mortality or the perceived over-abundance of available, potentially arable land.

(2) Reliance on traditional crops and forest resources for subsistence and economic purposes.

(3) Reliance on communal land inheritance patterns and joint ownership by virtue of family or kinship affiliation; such a strategy maximizes the amount of labor that can be called upon for agricultural purposes.

(4) Reliance on on-farm employment where land forms the base of the family's and community's economic security and resource recovery strategy. Off-farm employment is characteristic of the landless.

(5) Out-migration occurs largely in response to norms pertaining to marital residence patterns, internal conflicts within the family or community, or educational opportunities for children in families with a labor surplus.

(6) Women's main responsibilities rest largely to child caregiving, food production and processing, rather than community activities. Few single female-headed households exist since the migration of men out of the community is low.

(7) Due to resource abundance, few to no environmental protection and restoration efforts.

**Community Contraction (Forest Resource Preservation)**

(1) Diversification of labor increasing strategies to include paid labor when family labor is not possible.

(2) Small family sizes since greater economic resources are needed to raise children (the value of children changes from labor assets to economic liabilities).

(3) A shift from traditional crops to cash crops in response to increased market and family economic demands.

(4) A shift in landownership and inheritance patterns from communal land ownership to land fragmentation and single ownership, particularly where family size remains constant or rises while land availability declines (population per hectare of available land rises).

(5) Restricted on-farm family/community economic opportunities lead to a reliance on off-farm employment where the land provides a form of base security or

insurance, while off-farm employment provides cash for consumption (and possibly production) needs.

(6) One or more members of the household (male or female) migrate seasonally or permanently to earn incomes to help sustain the family in their natal communities. Emphasis is on maintaining the family's short-term economic stability rather than on more long-term development strategies such as education.

(7) Roles of women diversify, largely in response to increasing female headed households, to encompass family and community responsibilities.

(8) Decline in traditional forest/land resources, as recognized through indigenous systems of understanding or signs, can spark community environmental protection and restoration efforts.

The case of Baan Dawn and the above household survival strategy framework demonstrate the dynamic interplay between population changes and land/forest use. Population change in the community emerged as a function of the relationship between fertility, migration and resource availability. The particular mechanisms and relationships whereby the community's population increased or decreased impacted on community social and economic organization; family size, structure and organization; residence and inheritance patterns; occupation and educational patterns; and land/forest use (Table 1). It culminated in a community-wide reflection process where community members (a) reflected on their past, (b) realized their problems and how to identify them using an indigenously understood and developed early warning system, and then (c) determining appropriate actions through a community forestry management system. The key to this community's success is this reflection process rooted in their own remembered experiences and activated by socially important prime movers such as community leaders and religious leaders (in this case, Buddhist monks).

But while fertility and migration are adaptive mechanisms that shape the interplay between population change and environmental resource use, what must be remembered (and communicated in community forestry training programs) is that they are not always the main *causes* of environmental degradation. For the community here, macro-level forces such as climatic difficulties (as in Northeast Thailand during the community's first migration) as well as changes in the country's prevailing socio-economic and political climates are emerging more clearly as the sparks which ignited the dynamic interplay between population and environmental conditions. This can be more clearly seen if we look at the problem of landlessness in this region. In Northern Thailand, the number of landless people grew immensely from 1970 to 1987. This period of time equates to Period 2: Extra-Community Pressures for the research community. Figures for 1987 revealed that over 609,000 Northern Thai families were landless, the highest rate for all of Thailand. The main reasons for this were (and continue to be): 1) extension and promotion of tourism; 2) use of irrigation for non-agricultural purposes (such as golf courses, unplanned resorts and other land develop-

**Table 1.** Relevant population variables and their relationship to community change

| Population Variables | Community Expansion | Intermediary Phase | Community Contraction | Mechanisms of Change |
|---|---|---|---|---|
| Age structure | Working age concentration | Normal population age distribution | High percentage of elderly and the very young | As resources decline, the out-migration of working age people arises. |
| Fertility/family size | High | Declining | Low | Value of children shifts from valuable family laborers to economic liabilities in a cash economy. |
| Mortality | High | Declining | Low | Mortality declines as health and social service infrastructure improves. |
| Migration | In-migration | Stable in- and out-migration | Out-migration | As resources decline and/or the need for cash increases, working age people migrate out for work or land. |
| Family structure | Extended | Stem | Nuclear | Migration and the economic cost of caring for large families favor nuclear families. |
| Inheritance | Communal, family-based | Transitional | Individual, fragmented | Fewer children are provided with land as their inheritance. They must therefore migrate out of the community for work. |
| Economics/ Employment | Labor-based | Transitional | Cash-based | Agriculture and the use of environmental resources are insufficient to support families and communities. |
| Gender | Access to and control over household resources rests with women; those outside of the domestic domain rest with men | Transitional characterized by women's greater decision-making in resource obtainment and use | Joint decision-making with regards to resource obtainment and use, including community forestry issues | As families become smaller and more restricted in terms of resources, both men and women must share access to and control over them in order to maximize household survival. |
| Environmental resource use | Heavy | Transitional | Low | As resources become scarce and material goods can be purchased, reliance on environmental products declines. |

ment schemes); 3) loss of land due to public projects such as roads and dam construction; and 4) an increase in landed businesses, including the transfer of land from small farmers to large industrial or housing projects. Well-intentioned government policies also contributed to the landlessness problem. The Forestry Department, under its National Forestry Policy, for example, aimed to promote commercial tree farms in order to 'green' the country. This included evicting villagers from degraded forest areas. As a result, over 1.2 million peasant families became landless and were forced into the industrialized labor market in order to put food on their tables. The second stage of the household survival strategy above, community contraction, was thus motivated in multiple ways by outside forces that led to the reduction in available land/forest resources. What must be considered at this point, however, is not so much "who is responsible" but "what can be done." Bringing population considerations into the environmental picture shows promise and as such the household/community survival strategy concept may be useful in this respect.

## Population and Community Forestry Training Needs and Opportunities

Training programs in Thailand need to more fully integrate population issues in community forestry planning activities. Thus far, population and community forestry are treated as separate entities and have never been combined into a single integrated, holistic entity. Although some population issues have been explored in research projects related to community forestry, as noted above they have been used to compile descriptive profiles of communities for background information purposes only. They have not been used as analytical tools in community forestry planning. In the future, therefore, training programs to improve the capacities of foresters and demographers to facilitate local people in developing their own forest land management plans should integrate at least the following major population components, with a special emphasis on whether or not they have, are and/or will impact upon forest/land use patterns and potential environmental degradation.

### *Component 1: Population Structure*

*Main Thrusts/Objectives:* To provide analytical information on size, age and sex composition in relation to land and forestry use. Age and sex structure elements are core components of all demographic processes—fertility, mortality, migration, etc.—and accordingly have a direct relationship to rates of natural increase and overall increase or decrease in a community or other large social grouping. Age and sex structure also determines the proportion of men and women in the labor force and the dependency ratio which also is important for understanding past, present and project future settlement patterns and their population composition/characteristics (Grindstaff 1981).

***Component 2: Population Process - a) fertility; b) mortality; c) migration***

*a) Fertility and*
*b) Mortality - Main Thrusts/Objectives:*

a) To provide analytic information on births, spacing, family size, family planning accessibility, contraceptive method use, ability to choose when to have and when to stop childbearing.

b) To provide analytic information on mortality (another aspect of population change) which includes rates, differentials (i.e., age, sex, marital status) and causes. It will also enable an analysis of mechanisms to free males and females from morbidity and morality associated with reproduction and sexuality.

These two components of the demographic process (fertility, mortality) are fundamental for rational population control and the sustainable management and use of forest and tree resources.

*c) Migration - Main Thrusts/Objectives:* To enhance the understanding of foresters, other government officials, policy makers, etc. of the interrelationship between population movement and land/forest use.

Migration is seen as a fundamental factor determining population change, pressure and resource use (Lewis 1954; Rodgers et al. 1978). Increasing population density, whether from natural population increase or immigration, would also promote agricultural intensification (Boserup 1965) and degradation. On the contrary, land and forest degradation would induce out-migration (Kavanagh and Lonergan 1992).

Overall therefore, population change is a function of the interplay between fertility, mortality and migration. The particular mechanisms and relationships whereby populations increase or decrease have consequences on community social organization, family structure and organization, residence patterns and land/forest use (Grindstaff 1981).

***Component 3: Family Structure, Formation and Inheritance Patterns***

*Major Thrusts/Objectives*: To examine the relationship between family structure (i.e., types, status and roles, division of labor, family formation, family developmental cycle and inheritance patterns) and land/forest use. Family structure is dynamic and shaped by population change due to changes in fertility, mortality and migration. Coupled with inheritance rules, these aspects have had a tremendous impact on land use patterns, land fragmentation and forest use (Bilsborrow and DeLargy 1991).

***Component 4: Economic Organization and Opportunities***

*Major Thrusts/Objectives:* To provide analytic information on the relationship between types of economic activities (e.g., occupation, employment status, industrial status, income adequacy, etc.) and land/forest use.

***Component 5: Education***

*Major Thrusts/Objectives*: To obtain analytic information on the relationship between educational characteristics (i.e., literacy, level of completed education, school attendance, farm as well as non-farm skills, types of training [agricultural, non-agricultural]) and land/forest use.

***Component 6: Gender***

*Major Thrusts/Components:* To examine community diversity and the implications of this diversity for forestry development by focusing on the activities and resources of both women and men, clarifying where they differ and where they complement each other, the participatory role of women and men in development activities, and whether or not development objectives address the needs and priorities of women and men.

***Component 7: Household/Community Survival Strategies***

*Major Thrusts/Objectives*: While it is quite clear that demographic features impact upon land use and deforestation, the opposite (vice versa) is true as well. Bilsborrow and DeLargy (1991) have suggested the term "household survival strategies" for demographic responses to intensified land use and changing land ownership patterns. The key features of this concept are as follows.

a) A shift from traditional crops to cash crops on small plots. In contemporary Thai society, however, several farmers have shifted from mono-cash cropping to multiple traditional crops.

b) A shift from crops to livestock.

c) A recourse to local off-farm employment. The land provides a form of base security or insurance, while off-farm employment provides cash for consumption needs.

d) One or more members of the household migrate either seasonally or permanently to earn income to help sustain the family in the community of origin.

e) The entire family moves, either to new agricultural lands or to urban areas, both of which have environmental effects.

The household/community survival strategy concept, therefore, considers not only how populations impact upon forest/land use, but also how changing forest/land use patterns lead to changes in key population features (e.g., agricultural practices, occupation, migration). Consequently, it is an important integrating focus from bringing to light the interrelationship between population and community forestry variables. As such it should be a central part of an integrated training program in order to provide analytic information for uncovering the relationship between land use patterns, changing land ownership and demographic behavior. It is also valuable as a means to identify what strategies people may resort to if deprived of their forest/land use base either voluntarily or involuntarily through governmental actions.

## Conclusion

Like many developing nations, Thailand is coming to grips with the concept of sustainable development. This is especially relevant because of growing concerns about the social and environmental effects of the present manner in which natural resources are extracted and used for national development purposes.

Thailand's population and development situation contains many paradoxes. Hailed for its success in reducing population growth, improving health and nutritional status and for its rapid economic development over three decades, Thailand in many ways provides a model to be emulated. Yet in some respects these trends have not come without costs since they have generated large-scale problems, namely: increasing inequalities especially in education and wealth; environmental degradation particularly with regards to forest/land use; and the breakdown of traditional institutions including family and community structures and organization, due in part to increasing demands to migrate for economic and occupational gains. All of these problems, moreover, are to a large extent inextricably linked, and their determinants and consequences are most clearly evident in terms of forest/land use.

What is occurring now is that this added population segment is coming of age in a situation where Thailand's existing socio-economic infrastructure is gradually facing a build-up of contraints. This compels some of the population to step up their activities in exploiting available natural resources, sometimes in ecologically fragile areas, while others migrate to new areas either to open up new land for cultivation or sell their labor, albeit as unskilled workers in the industrial sector in urban areas. This scomplicated by the fact that traditional farming is still based on simple farming technologies. Once the traditional pattern of farming no longer supports people's minimum requirements, they either move to new areas to engage in extensive farming if land is easily available, or intensify their farming practices if land is scarce. Here lies the crux of the situation. On one side of the coin, it is believed that both of these

methods are environmentally destructive, especially in forest conditions. This is true when considerations of short-term gain override the objective of sustainable agriculture and environmental practices. On the other, though, cases like Baan Dawn are emerging in Thailand which show that both methods can be environmentally benign or even extremely constructive when community members follow principles of sustainable environmental and/or agricultural practices. It is these positive cases that can be used as a springboard for training and increasing awareness of how population variables can become integral parts of forest and enviornmental management policies, plans and programs.

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