

# Land Use and Sustainability in the Highlands of Northern Thailand

– Problems facing the Traditional Agricultural System  
of the Pgaz K’Nyau (*Karen*) in Northern Thailand –

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## Abstract

The mountainous regions of north and west Thailand are populated by several minority ethnic groups. One of these groups is the Pgaz K’Nyau, generally referred to as Skaw Karen. This paper is concerned with the traditional rotational swidden cultivation practice of the Pgaz K’Nyau, and the recent historical background to the tension between the Thai forestry authorities, who claim that swidden cultivation destroys the forest and so wish to outlaw it, and the Pgaz K’Nyau people, who believe that their swidden cultivation practices are sustainable and in harmony with the forest ecology. The current Thai forestry authorities’ policy towards minority ethnic groups who inhabit the forested highlands is to persuade them to change to modern cash-cropping farming methods. This paper attempts to show through both a literature review and field research that, with regard to the Pgaz K’Nyau, the policies adopted to prevent forest degradation are less sustainable than the traditional swidden cultivation practices.

## I Introduction and Background

It is clear from the reports of American Baptist missionaries, who first made contact with what are known as the *Karen* people in Burma in the first half of the 19<sup>th</sup> century, that there were huge tracts of essentially empty mountain forest land in eastern Burma, in the area adjacent to the present-day border with Thailand. [1] At the time (the 1820s), world population had just passed the one billion mark. It now stands at over 6.5 billion.[2] All the world's useful or ecologically valuable land is now integrated into one or another nation-state, and is usually jealously guarded, controlled and regulated by the laws of the state for the benefit of its people. This is the ultimate reason why ethnic groups in the forested northern Thai highlands have either had the land they are able to use for subsistence farming severely restricted, or have been under intense pressure to leave their forest villages and relocate to the lowlands or other locations provided by the Thai government.

World population will possibly peak during the 21<sup>st</sup> century at between 7.5 and 10 billion people, perhaps never to rise again. The populations of many advanced industrial nations including Germany, Italy and Japan are expected to be lower in 2050 than in 2005.[3] Japan's population peaked in 2005.[4] The world, under its current fossil-resource-based technological regime, appears to be approaching its carrying capacity. Fossil resources (especially oil) have been central to the world population explosion of the last two centuries. As these limited fossil resources start to become scarce later this century population growth is likely to slow and turn to decline.[5] However, in this current "full house" world, ethnic minority groups who inhabit the peripheries of nation-states are likely to receive rough justice when the control of resources that exist in the regions they inhabit, often the resources they rely upon for life and for the continuation of their culture, become an issue of importance for the state involved. The *Karen* are certainly not unique in this respect, but their story is complex and, as yet, little known throughout the world.

Firstly, it is important to understand what the term *Karen* implies. The first certain reference to the Karen in English, in 1759, mentions *Carianners*, an English version of the Mon word *Kariang*. This Mon term is a combination of *kha* (a Tai term meaning hill peoples) and *riang* (meaning forest people living in association with Tai people). In some languages and dialects, the initial "r" has been dropped and *riang* has become *yang* (as the *Karen* are known in the northern Thai dialect). In Burmese, *kariang* is pronounced *kayin*, but the English has retained the "r" to become *Karen*.[6] The current standard Thai language term for these people is *gariang*. To summarize, the term *Karen* is thus originally a pejorative term that meant "uncivilized peoples with different languages and

customs, who live in the mountain forests and who are loosely associated with lowland Tai people." As such, there is no general agreement on exactly which ethnic groups are indicated by the term.

When I tell acquaintances I have been visiting *Karen* villages in northern Thailand, they (even Thais) often say, "Oh, the people with long necks?" This illustrates very well the above point about the term *Karen*; it does not seem to refer to any specific people or even a coherent group of linguistically and culturally related people. This long-necked people (long-necked because of the brass rings worn around the neck by women) are known as *Padaung*, and are found mostly in Kayah State in Myanmar. They are thought to be a sub-group of the *Bwe Karen* group.[7] The Summer Institute of Linguistics *Ethnologue* website lists 20 separate *Karen* languages, all belonging to the Tibeto-Burman language family, but covering a large range of ethnic peoples *who recognize no common identity and whose languages are mutually unintelligible*. [8] Although it may be a useful (though largely meaningless) generic term, since most of the world recognizes it, I will henceforth refrain from using the term *Karen*, as it rather shakily and contemptuously refers a large group of diverse peoples who have specific self-designations. As far as Thailand is concerned, and for the purposes of this paper, *Karen* refers only to two groups of people; the *Pgaz Cgauz* and the *Phloun*, as will be explained below.

The *Pgaz Cgauz*[9] (often written *Skaw*, *S'gaw*, *S'gau*, and so on) who inhabit the hills around, but generally to the west of, Chiang Mai city call themselves *Pgaz K'Nyau* - which simply means "people". They use the term *Pgaz Cgauz* to distinguish themselves from other culturally and linguistically similar groups, which in Thailand refers to the "*Pwo Karen*", whom the *Pgaz Cgauz* call *Pgaz Pgoj*, but whose self-designation is "*Phloun*". The content of this paper refers to the agricultural system of the *Pgaz K'Nyau* (i.e. *Pgaz Cgauz*) people.

Accurate population figures do not exist, but the fifth edition (2004) of the Chiang Mai Tribal Museum's pamphlet *The Hill Tribes of Thailand* gives a 2002 figure of 438,131 *Karen* in 87,628 households, in 1,912 villages.[10] Two groups, the *Kayah* (presumably including the *Padaung* people) and the *Taungthu* are also classified as *Karen* along with the *Pgaz K'Nyau* and the *Phloun*, but their numbers in Thailand are small. For a 2006 figure, it might be reasonable to estimate that *Pgaz K'Nyau* are in the region of 350,000 and the *Phloun* close to 100,000 people. Renard gives figures of *Karen* in Burma of between three and seven million *Karen*, though it is unclear how many of these are *Pgaz K'Nyau* or *Phloun* and so on, or how many of these *Karen* live on the plains and make their living from wet rice cultivation, not mountain swiddens.[11]

An even more problematical question, outside the scope of this paper, is where the *Pgaz K'Nyau* originally come from. It is generally thought that they migrated south to where they live now in eastern Myanmar and north-west Thailand from the north (i.e. from the region that is now Tibet, China and Mongolia), but that is where agreement stops. The *Pgaz K'Nyau* themselves have no written history and almost no oral historical tradition. In the absence of any corroborative evidence, any statement concerning the location of the original *Pgaz K'Nyau* homeland is pure speculation.. The linguistic designation Tibeto-Burman is no more helpful since it is itself generally subsumed under Sino-Tibetan, thus simply indicating an origin roughly north of modern-day Myanmar.[12]

*Pgaz K'Nyau* presence has been documented in what are now the Thai provinces of Mae Hong Son and Chiang Mai from at least the late 18<sup>th</sup> century, arriving by gradual migration east from present eastern Myanmar.[13] However, at the time, there were no clearly demarcated borders and the nation-state of Siam (changed to Thailand in 1949) existed only in embryonic form. What is now northern Thailand was the kingdom of Lanna, with its capital at Chiang Mai, which was controlled by the Burmese for over two centuries (1558-1774). Northern Thai forces allied with the Siamese drove the Burmese out, but the city was so weak that it was totally abandoned, and later formally

re-established in 1796. Chiang Mai was assimilated administratively into the Kingdom of Siam in 1892, during the reign of King Chulalongkorn (Rama V, who reigned as King from 1873 to 1910). Chiang Mai was finally integrated economically into the Siamese state when the Bangkok-Chiang Mai railway was completed in 1921.[14] As with many ethnic groups around the world, as a result of the formation of nation-states during the colonial era, and as world populations began to explode towards the end of the 19<sup>th</sup> century and in the 20<sup>th</sup> century, the Pgaz K'Nyau have found themselves inhabiting peripheral areas of, and straddling international borders between nation-states. A possibility for *Karen* autonomy within the Union of Burma (Kayin State still exists as a separate administrative region of Myanmar) did exist following the end of WWII, but this soon collapsed and the unfortunate history of post-war Burma has consequently resulted in massive human rights abuses towards all ethnic groups in present-day Myanmar, including the *Karen*. [15]

The subject of this paper is the traditional Pgaz K'Nyau agricultural system, rotational swiddening, which is discussed in the context of sustainability and the connections between commercial energy and food production. This system uses effectively zero commercial energy and is a potentially sustainable system of forest farming. The Phloun and the Lua (also known as Lawa) also have a very similar system, and other ethnic groups throughout south-east Asia also operate similar agricultural systems.[1] Details of the system are given elsewhere, and only a rough outline is given here.[17]

Some basic background must be given here. Firstly, what is a "swidden"? It is any piece of land that, before cultivation, is slashed and burned. It is also unirrigated. It may be used for just one year before moving on to another piece of land, or it may be cultivated for some years, sometimes until the soil loses its fertility and productivity (crop yield) drops to a level which makes cultivation pointless. There will always be a period of fallow following cultivation, which will be longer than the period for which the plot was cultivated. The general image of this slash-and-burn agriculture in tropical forest areas is that it destroys the forest. The Pgaz K'Nyau (Phloun and Lua) system has been shown to be sustainable provided certain conditions are met. Their system is basically that they only cultivate a swidden plot for one year. The following year they make another swidden in a different place, but in a place where they have made one before. In other words, a place that has been fallow for some number of years. The number of fallow fields they have determines the number of years of the rotation. Generally, the fallow rotation period should be at least six years, which means that a farming household would hold the right to use a total of seven plots of land in the forest. Currently rotation periods of three to eight years are common. Until about the late 1980s rotation periods of ten or even 15 years were common.[18]

The number of years for fallowing, the rotation period, depends on the local ecology. The longer the better is not necessarily true. After a certain number of years of fallowing (generally 6-12 years) the plot will be just right to burn and cultivate again. Any less or more time may result in smaller yields. The main crop is dry, highland rice. Theoretically, this system can be operated forever; it is sustainable. In Chiang Mai Province there are Pgaz K'Nyau villages that have been in the same place for over 150 years.[19]

It follows from this that there is a great deal of diversity. Visits to several Pgaz K'Nyau villages easily reveal that each one has its different topography, local climate, ecological setting, resource endowment and so on. Further, just as society as a whole is not static, rotational swiddening also changes as it adapts to local, national and global political and economic events and developments. It is almost true to say that the situation in the hills of northern Thailand, as we have seen from the brief history above, has been in a state of flux for hundreds of years, and that the surge in economic development starting around the 1930s has accelerated this tendency enormously.

It is important to look at the practice of rotational swiddening in the overall context of changes in land use in Thailand during 20<sup>th</sup> century. A land of just over 513,000 km<sup>2</sup>, at the beginning of the 20<sup>th</sup> century Thailand had about 75% forest cover. By the first years of the 21<sup>st</sup> century, this proportion was down to about 25%. (Table 1)

The main reasons for this loss of forest cover are:

- Expansion of agricultural land caused by population increase and the production of cash crops for export.
- Legal and illegal logging. (Illegal logging, by both organizations and individuals, was estimated to account for about 30% of deforestation in the 1980s.) [20]

<b>Table 1: Thailand's Forest Cover %</b>						
<b>Year</b>	<b>1900</b>	<b>1961</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1999</b>
<b>Total</b>	<b>75</b>	<b>53</b>	<b>29</b>	<b>27.3</b>	<b>25.6</b>	<b>25.1</b>
North		69	50		43.6	42.8
North-east		43	14		12.6	12.4
Central		53	26		23.0	22.6
South		42	22		17.6	17.0

Sources:

1900: Delang, p.155

1961, 1985: Falvey 249

1990: Agricultural Statistics of Thailand (1998/1999) p.266

1995, 1999: Office of Agricultural Economics – <http://www.oae.go.th/>

The problem has been most severe in north-east Thailand, where increasingly less fertile land has been put under cultivation in rain-fed wet rice fields and cash crops such as cassava and sugar cane. [21] In the south, rubber plantations have taken over large areas of the highlands and were partially responsible for the flooding disaster in which 386 people died in November 1988. It was this disaster that finally forced the Thai government to implement a total logging ban in 1989. "Shifting cultivation in the highlands" is also often considered to be a "major" cause of deforestation in Thailand. However, as can be seen from Table 1, northern Thailand has maintained its forest cover relatively well. In fact, the settlement areas of the ethnic groups, the north and west of Thailand accounted for about 55% of the total forest cover in the early 1960s, but was 69% of the total in the late 1990s. This shows that the main deforestation has taken place in the relatively flat areas suitable for wet rice cultivation and cash crop production.[22]

This is clearly a very simplistic overview which does not consider whether or not *some* forest may have been destroyed, or is still being destroyed, by agricultural practices of ethnic groups in the mountainous forest areas of north or west Thailand. If this is in fact the case, then the Thai government naturally has legitimate concerns in wishing to minimize or totally prevent any forest destruction in these areas as part of a comprehensive forestry policy for the whole country.

The government wants to protect the watersheds.[23] It also sees the forests as economic resources which can be better utilized for tourism, recreation, commercial wood plantations and so on than having ethnic groups inhabit and carry out subsistence farming in them. Because of this the government appears to have chosen not to investigate into the agricultural systems of the various ethnic groups to see which are sustainable or unsustainable, or what can be done to adjust these systems so that they cause minimal forest destruction, but to simply assume that "man and forest cannot coexist".[24] The government also maintains that even if the agricultural systems are apparently sustainable in their present form, population growth will result in the expansion of swidden/fallow areas *ad infinitum* until the whole forest has eventually been destroyed. These

claims and the policies which have derived from them deserve more detailed attention.

The question of whether man and forest can coexist is a complex one. Japan's forests cover approximately 67% of its land surface. Since it became possible to import cheap timber from southeast Asia and north America following deregulation of timber imports in 1964, Japan's forests have not been properly maintained due to lack of income. They are now generally considered to be in a very dilapidated state. Not only is it not profitable to manage the forests appropriately, Japan's national forests, about 20% of the total, were in debt to the tune of 3.8 trillion yen (approximately US\$33 billion) in 1998.[25] Appropriate, sustainable management of forests can benefit from human intervention. The blanket statement that "man and forest cannot coexist" is extremely over-simplistic. Instead of 'blaming' ethnic minorities for deforestation, flooding, drought, forest fires, soil erosion, and so on, more realistically the situation is probably that at least some agricultural practices of ethnic minorities in the mountains may be providing the state with free services, such as sustainable management of watersheds, preservation and enhancement of biodiversity and control of forest fires. The time and effort should be taken to find out exactly which practices were favourable under what conditions. However, forests are hotly contested areas of resources. Extraction of forest resources for economic benefit is clearly in conflict with the wishes and rights of ethnic groups who live in the forest, but when society suddenly wakes up to the discovery that the nation's forests have become severely depleted, someone has to take the blame. [26]

A study of shifting agriculture in Thailand, Laos and Vietnam found that, "Policy-makers have ... generally failed to distinguish between the different types of shifting cultivation." The study found that rotational systems were "potentially benign" and noted that, "Partly as a result of this lack of analysis, policy responses to the set of perceived highland problems have *lacked practicality*, ... *lacked focus* ... *lacked popular support* ... *lacked coordination and consistency* ... [and] *lacked a learning and adaptive approach*: efforts in highland development and conservation have largely neglected to take into account indigenous knowledge and the positive values of shifting cultivation systems." [27] (Emphasis in original)

The main policies that the government has pursued towards the ethnic groups in the mountain forests (to be fair there are Thais there too) have been:[28]

1. The resettlement of villages or ethnic populations
2. The outlawing of opium production
3. The outlawing of swiddening
4. The introduction of cash crops for the lowland Thai market

Although these policies are interrelated and generally implemented together in most cases, an explanation of each of them is attempted below.

### **I.1 The resettlement of villages or ethnic populations**

For several reasons the resettlement policy has failed and it appears that it is no longer possible to implement. The Land Settlement Program (*nikhom*) was initiated in the 1950s. Resettlement centres with stores, clinics and schools were set up in various provinces and forest-dwelling ethnic groups were invited to move to them. In July 1958, the Interior Minister, General Phrapas, stated that the hill people "must settle down permanently in big villages and abandon the nomadic life they have been accustomed to in the past." Villagers resettled in such centres were subject to a program of "accelerated integration which was really a crude attempt at engineering assimilation." [29] It very quickly became apparent that the expected mass migration of people from the forests was not going to occur. In 1966, General Phrapas was forced to admit that, "Immediate success of the Land

Settlement Projects has not measured up to the earliest hopes for them" because "the tribal peoples are slow to abandon their old independent ways and move into the resettlement areas." [30]

Particularly controversial have been the status of ethnic populations living in areas that have been declared National Parks or Wildlife Sanctuaries. The events that have taken place in the Huai Kha Khaeng and Thung Yai Naresuan Wildlife Sanctuaries over the last three decades are very typical of the kind of treatment ethnic groups in north and west Thailand have been, and are still being, subjected to. Phlounge (*Pwo Karen*) villages in the Huai Kha Khaeng Wildlife Sanctuary (Uthaitani Province) were removed in the 1970s when the Sri Nakin Dam flooded their settlement areas. Hmong villages were also removed from this and the adjacent Thung Yai Naresuan Wildlife Sanctuary (established in 1974) in the 1980s and early 1990s. In the early 1980s a dam project that would flood an estimated 223 km<sup>2</sup> area of the Thung Yai Naresuan Wildlife Sanctuary, the Nam Choan Dam project, was proposed. This would have necessitated the forced removal of Phlounge (*Pwo Karen*) villages from the Wildlife Sanctuary, but in 1988 the project was abandoned due to overwhelming pressure from the public, mainly brought about by NGOs and journalists.

In December 1991, the two Wildlife Sanctuaries were declared Thailand's first World Heritage Site. Soon after the declaration the World Bank and the Thai Ministry of Agriculture announced a joint project designed to improve biodiversity conservation and protected areas management. The project included the resettlement of the remaining Phlounge villages in Thung Yai, but strong public criticism prevented the Royal Forestry Department (RFD) from actually carrying out the resettlement plan. Since the villages could not be moved, the RFD prohibited the use of fallow areas more than three years old, thus spelling the end of traditional land use arrangements. A fallow rotation period of three or four years would result in decreasing fertility (productivity) of the swiddens, which is what was actually happening by the late 1990s.

In April and May, and continuing through to November and December of 1999, the RFD and the Thai military moved into the Phlounge villages in Thung Yai sanctuary, burned down religious shrines and a rice barn, demolished huts and personal property, demanded that the villagers stop growing rice, confiscated identity cards and house registration papers (thus depriving villagers of a legal basis for residence), removed families which did not possess Thai identity cards, arrested people for days without a warrant, prevented villagers from using their fields, and attempted to convince villagers to resettle 'voluntarily'. [31]

In early 2002, the RFD began planting tree seedlings on some of the villagers' remaining food-growing areas. Harming these seedlings during cultivation (e.g. during the preparation or burning of swiddens) could lead to charges of forest destruction, leaving the villagers with the stark choice between starvation or possible arrest.[32]

The possible adaptations to this situation are to intensify cultivation on the land that the RFD still permits the villagers to use, and/or to resort to wage labour. More intensive cultivation, whether for subsistence or cash cropping, would require the use of chemical fertilizers and pesticides, which the villagers do not have the money to buy. Agricultural intensification is being promoted by government organizations and NGOs working in the sanctuary, but most of the villagers reject these moves and attempt to continue to eke out subsistence livelihoods using traditional farming methods. Intensification of agriculture inevitably results in the clearing of permanent fields, changes in land-use rights patterns, chemical pollution of the local environment and its concomitant wildlife and human health problems. Given the fact that resettlement is now not an option for the government, their chosen policy implementation does not appear to be in any way environmentally more benign than allowing the villagers to continue to carry out rotational swiddening, albeit under the strict control of the RFD and other government organizations to ensure that the system does not

in some way get out of hand. Or perhaps the RFD, the military, and other government institutions involved believe that the villagers will eventually perceive their position to be so precarious and full of anxieties that they will give up and move out of the sanctuary of their own accord.

Pinkaew Laungaramsri, however, notes that:

*"After the 1994 forced relocation of ethnic hill people from Lambang's Doi Luang National Park by forest authorities, it was found that many villagers had left the uncultivable resettlement site and fled deeper into adjacent fertile forest areas. In addition, in the old settlement of Pa Cho village, without villagers' guardianship, forest fires damage a massive amount of forest area every year."*[33]

Admittedly, it is not only non-Tai/Thai ethnic groups that have been the subject of resettlement programs. It is estimated that nationwide in Thailand around 10 million people lived in forest reserves in the early 1990s. In the mid-1980s and early 1990s, the Thai military attempted to implement two large reforestation projects, the Isaan Khiaw (Green Northeast) project and the Khor Jor Kor project (a scheme to distribute subsistence land to poor and landless people in degraded protected forest areas), which would have required the resettlement of 1.2 million people and 6 million people respectively. Both failed due to heavy resistance.[34] The Thai government is therefore going to have to find a way of managing forested areas which does not include the resettlement of the people living there. It is clear from the above that this will require a fairly comprehensive policy rethink.

The Thai Ministry of Natural Resources and Environment (MONRE) was established in October 2002, and includes a new Department of National Parks, Wildlife and Plants (DNPWP). In the inaugural issue of its *MONRE News* (March 2003), the MONRE Minister, Mr. Prapat Panyachatraksa, and Permanent Secretary, Dr. Plodrasop Suraswadi speak of their Ministry's vision and direction.

"It is well recognized that a number of natural resources and environmental problems confronting Thailand are approaching critical levels. The situation presents a common challenge for every Thai citizen. In response to this challenge, the Thai Prime Minister, H.E. Dr. Thaksin Shinawatra, has repeatedly declared his commitment 'to rehabilitate nature and restore indigenous knowledge to the Thai society.' This is a commitment shared by the Ministry of Natural Resources and Environment (MONRE) as seen in its efforts to serve Thailand and the Thai people.

"The Ministry's vision clearly defines its role as the Thai Government's central organization responsible for the management of natural resources and the environment, taking into consideration four key concerns; ecological requirements, public participation, cultural diversity and good governance. The goal is to achieve and maintain a balance between the need to ensure a good quality of life and to provide a basis for Thailand's sustainable development. This goal embodies basic concepts that are at the heart of the Ministry's work. In pursuit of its vision, the Ministry seeks to maximize people's participation in the sustainable management, utilization and rehabilitation of natural resources.

"Expounding on MONRE's direction for environmental management, Minister Prapat Panyachatraksa, pointed out, *'In the next phase, environmental management will focus on the preservation, conservation and rehabilitation of natural resources for their sustainable use, based on the concept of good governance and public participation.'* Mr. Prapat was speaking at the celebration of Thai Environment Day on December 4,

2002." (Emphasis in original)

Pgaz K'Nyau people well known to this author remain sceptical about MONRE's and the Thai government's commitment to "indigenous knowledge", "cultural diversity", "public/people's participation", and "good governance", but perhaps it is yet a little too early to judge.[35]

The 1997 Constitution of the Kingdom of Thailand, specifically Sections 46, 59, and 78, enshrine the rights of traditional communities with respect to their natural resources and environment, the right of public participation in decision-making that might affect communities, and the decentralization of powers to the localities.[36] It was in this context that a Community Forestry Bill, a law that would enable communities to have management rights over forests included in their village lands, even if included in a National Park or Wildlife Sanctuary, was proposed. However the parliamentary debating process has been suspended since 2002. (See I.3 below)

The present Thai King, King Bhumibol (Rama 9<sup>th</sup>), in a 1973 speech has stated concerning forestry mapping:

*[I]t seems rather odd for us to enforce the reserved forest law on people in the forest which became reserved only subsequently by the mere drawing of lines on pieces of paper. The problem arises in as much as with the delineation done, these people have become violators of the law. From the point of view of law it is a violation because the law was duly enacted. But according to natural law the violator of the law is he who drew the lines, because people possess the right to live. Thus it is the authorities who encroached upon the rights of individuals and not the individuals who transgressed the law.[37]*

One would hope that the King would not find the substitution of the word "individual" by the word "community" in the above quote. There can be few countries in the world where the king is revered as much as is the present King in Thailand. It is therefore sad to note that there are bureaucrats, politicians and businessmen in that country who appear to feel that their work is better served by ignoring the statements of the King.

## **I.2 The outlawing of opium production**

The growing of opium poppies for the production of opium (then morphine and heroin from the raw opium) is an exceedingly complex social, economic and political topic that can only be dealt with here in the barest detail. Opium production, as a cash crop, in northern Thailand, Burma, Laos and southern China has been carried out by Hmong, Yao, Akha, Lisu, Lahu, and local Thai peoples.[38] The highlands of northern Thailand and the adjacent highlands of Laos and Burma are well known as the Golden Triangle for this reason. Opium production is carried out at relatively high altitudes, in Thailand in the highest regions of the mountain forests, generally over 1000m ASL.

The Royal Thai Opium Monopoly was established by King Mongkut (Rama IV) in 1852 under British pressure to legalize opium imports into the kingdom.[39] Large numbers of Hmong and Yao began to move south from China in the middle of the 19<sup>th</sup> century. Some of these eventually made their way into northern Thailand in the early decades of the 20<sup>th</sup> century, but it was not until around the end of World War II that large numbers of Hmong, Yao, and Akha, Lisu and Lahu by way of Burma, began to arrive in the highlands of northern Thailand.[40] At the first UN narcotics conference in 1946, Thailand was criticized as being the only country in southeast Asia operating a legal government (opium) monopoly. There was general agreement that all non-medical opium exports should be ended as soon as possible, and several major producing countries had already implemented production or export bans. The Thai government, in order to secure supplies of opium for its royal monopoly, therefore decided to authorize poppy cultivation in the northern highland

areas in 1947.[41] From this time until opium poppy cultivation was declared illegal in Thailand in 1959, Hmong and other poppy cultivating peoples were attracted into Thailand from Laos, and local opium production and trade increased dramatically.[42] The establishment of the People's Republic of China in 1949 very quickly brought an end to opium production and export from China. During the fifties, Thailand became the world's most important opium distribution centre, and the Burma, Laos, Thailand Golden Triangle had become the source of more than half of the world's illegal opium.[43] In 1959, following a coup in October 1958, the Thai government passed the Harmful Habit-Forming Drugs Act, which outlawed cultivation, production, distribution, import, export, sale and consumption of any type of harmful habit-forming drug. From that time onwards, the Thai government made efforts to eradicate opium production in Thailand. The large area and inaccessibility of Thailand's highlands made it hard to do this in a hurry, but by about the early 1990s opium production had effectively ceased in northern Thailand.

The Pgaz K'Nyau are not traditionally opium poppy cultivators. Most Pgaz K'Nyau villages are between 400m and 1000m elevation, but there is some overlap between the higher Pgaz K'Nyau villages and the villages of the poppy cultivating peoples at their lower elevations. The highest Pgaz K'Nyau villages inhabit the lower montane forest, but most are in the dry deciduous Dipterocarp forest.[44] Most of the villages of poppy cultivating people are in the lower montane forest at elevations of 1200 to 1500m. The agricultural system of the poppy cultivators also differs from that of the Pgaz K'Nyau in several key respects. [45]

The Pgaz K'Nyau rotational swiddening system (described above) is classified by Kunstadter as *short cultivation-long fallow*. That of the Hmong and other poppy cultivating peoples is classified as *long cultivation-very long fallow*. Under this system, a forest plot is cut and burned and repeatedly, for up to about seven years, planted with maize and intercropped with vegetables. (A separate plot, generally cultivated for two to three years, is also planted with dry rice intercropped with vegetables.) After the maize is harvested in September, poppy seeds are sown. Opium is harvested from the poppies between December and March. The fertility of the soil in the plot will gradually decline until very low productivity makes it unprofitable to cultivate the plot any longer. During this time the hardy, fire-resisting *Imperata cylindrica* (*kha* grass, or Cogon grass) will take hold in the plot, which will now be abandoned for a new plot, usually further from the village. When all available plots within reasonable distance of the village have been used the village will then relocate to a new area to begin again. The cultivated area surrounding the former village becomes an *Imperata cylindrica* grassland on which the forest will not regenerate for at least 40 years.[46]

Overgeneralizations concerning swidden agricultural systems in the highlands of northern Thailand have characterized all these systems as destroyers of the forest. These accusations are, however, exaggerated and do not take into account either the diverse nature of the different systems or the many other factors affecting environmental change in these areas. Both Tapp and Santasombat argue that characterization of ethnic group highland agricultural systems and techniques by Thai officialdom has been myopic and over-simplistic.[47] Until recently, all ethnic group agriculture in the western and northern Thai highlands was termed by RFD and other relevant government organizations as "drifting cultivation" (*rai luan loy*).[48] It is probably fair at this stage to sum up by saying that the swidden system of the Hmong and other opium poppy cultivating peoples is better described as shifting (because their villages must relocate periodically) pioneer swiddening in primary forests, and that the Pgaz K'Nyau swiddening system is best described as permanent (or sedentary, because their villages can effectively remain in one location permanently) rotational swiddening in secondary forests.[49]

Although, as stated above, the Pgaz K'Nyau are not traditionally opium poppy cultivators, they have

been involved to a certain extent in opium production, and this has had an important effect on Thai officialdom policies towards the Pgaz K'Nyau over the last 50 years. The most common scenario for Pgaz K'Nyau involvement in opium production has occurred when an opium-cultivating group, usually Hmong, has migrated to the vicinity of an established Pgaz K'Nyau community. Recorded instances show how a Hmong group will settle close to an established village and gradually encroach upon that village's lands, generally by taking over fallow areas for maize and opium poppy fields. Despite resistance from the established village, the Pgaz K'Nyau villagers have usually ended up working as hired labour on the Hmong poppy fields. This is because poppy cultivation and tapping are extremely labour-intensive and Hmong families are not usually able to cope fully with the workload and find it profitable to be reliant on hired labour from among the populations of villages of other ethnic groups. Payment was in opium, about a gram a day, the result of which was the spread of addiction among the labourers.[50] Many Pgaz K'Nyau villages also began to cultivate opium poppies in small swiddens of 1-2 *ngan* up to 1-2 *rai*. Pinkaew Laungaramsri describes a Pgaz K'Nyau village in Mae Chaem district, Chiang Mai Province where, in the 1960s, after working in the Hmong poppy fields for a few years, every household in the village began to cultivate their own small poppy fields in old fallow land.[51]

The reason for this is that opium is an excellent cash crop, and with the increasing encroachment of the money economy into lives of villagers in the highlands, the need for cash to buy daily essentials (e.g. salt and iron tools) was growing, as it continues to do so today. Traditionally, the Pgaz K'Nyau were able to earn good cash incomes from the use of elephants. During the 19<sup>th</sup> century and early part of the 20<sup>th</sup> century (up to the 1940s), the skill of the Pgaz K'Nyau mahouts and the power of their elephants were an essential element in the logging industry of Burma and Thailand. With the mechanization and phasing out of commercial logging this source of cash income dried up. Opium was one of the substitute sources of cash income that the Pgaz K'Nyau could turn to in the period following World War II.[52] What is special to opium are the lucrative profits that can be made as it moves from one stage to the next, and therefore its immense capacity to attract cash: A Hmong saying goes, "Opium doesn't go looking for money, money comes looking for opium." [53] In the village studied by Pinkaew Laungaramsri, opium production in the village brought about a change in power relations between the highland and the lowland people. Whereas previously the highland ethnic group villagers had to travel to lowland towns and villages to trade, during the opium harvesting season crowds of traders would make their way to the villages to trade goods for opium.

The main plank of policy implementation of outlawing of opium production in the northern Thailand highlands has therefore been the attempted substitution of the opium poppy by cash crops such as vegetables, fruit or flowers grown on contract or for sale in lowland markets, and this is the topic of section I.4.

### **I.3 The outlawing of swiddening**

As mentioned above, the Thai government and Thai governmental organizations involved with forestry have, over the last 50 years taken the stance that all ethnic group agriculture in forested areas is inherently destructive of the forest or will eventually destroy the forest through expansion of cultivated land necessitated by population increase. Official concern about forested highland regions has focused on three areas: national security (concerning sensitive border areas and possible ethnic involvement with communist insurgency), narcotics production and trade, and watershed integrity.[54] The first is thought to be of little relevance today and is outside the scope of this work. It will therefore not be dealt with here. The second has been briefly dealt with in section I.2. The last area of concern, the integrity of watersheds and the policy implementation involved is the main subject of this section.

The stance of the Thai Royal Forestry Department appears to have been represented by its Director

General when he stated in September 1998 that, "Man cannot coexist with the forest...Humans can't live in the forest because human beings aren't animals. Unlike us, animals can adapt themselves to the wild or any environment naturally." [55] When Suthee Argaslerksh was permanent secretary of the Thai PM's office in the 1980s, he stated that,

*"These are not innocent hilltribesmen who do the traditional slash-and-burn cultivation. They are more sophisticated, and I would say more dangerous, than you would think... They grow maize to sell the crops in town. Some of them even have pick-up trucks to transport the crop into town and to take supplies back to their communities. In one community on Doi Inthanon, Chiang Mai, some hill people have bought 10 wheeled trucks... While many of them have settled down, others still roam in the northern region and they resist government attempts to confine them to any settlement areas. We used to think they are helpless pitiful people. But now, we have found that they are also extremely destructive to our forest and we must stop them."* [56]

The chief of Klong Wang Chao National Park in Tak Province stated in *Watershed* journal in November 1995 that, "The best way to safeguard the forest is to relocate them (hill tribes) and allow the authorities to manage the forest...This is necessary because [we] must preserve and rehabilitate the forest which has been destroyed by these hill tribes." [57]

These quotes show both a lack of sensitivity towards ethnic groups who inhabit the forested highlands, and, because of their highly subjective and discriminatory blanket-statement nature, an almost complete unwillingness to attempt to research into the nature of highland ethnic people's agriculture and way of life. The general *modus operandi* of the RFD in protecting the forests can be seen from a few examples (and also the one above about Thung Yai).

In 1965 the Mae Wang catchment area was gazetted by the RFD as a national forest reserve, and a forest protection and plantation unit was established there in 1975. The RFD issued logging concessions (commercial forestry was a major part of RFD work until the total logging ban of 1989) to the Thai-am Tobacco Company for commercial exploitation of the forests for wood to fire its drying kilns further downstream. Logging roads were constructed and farmers were brought in by local timber millers to fell trees. Over the period of the concessions, rapid loss of forest cover occurred, but the RFD continued to promote itself as the defender of the forest. When the last logging concessions expired in 1985, based on disinformation that local people were entirely responsible for the forest loss, a strong campaign was initiated to bring shifting cultivation to a halt. Fallow land previously cultivated by the Pgaz K'Nyau of Baan Huai Hoi and many other villages were selected for the establishment of plantation forests. In addition, the RFD insisted that agriculture in the village was from that time on limited to permanent fields. [58]

Tambon Huai Poo Ling is one of five sub-districts of Mae Hong Son's central district, and one-third of the area lies within the Nam Tok Mae Surin National Park, established in 1981. The entire population of the Tambon is Pgaz K'Nyau Cgauz (in 1998, just under 4,000 people, about 10 cap/km<sup>2</sup>). 80% of the Tambon has been classified as Class 1A watershed, which means that technically the area is protected forest and no settlement is allowed.

*"However, since the villagers preserve their forests so well, the satellite images that were used for surveying showed a dense forest cover for the area. This is a paradox situation, in that Karen farmers who practice a sustainable system of forest and land management are threatened with eviction, while those in areas of permanent forest removal are allowed to remain there."* [59]

Huai Hee village, in Tambon Huai Poo Ling, was established in about 1820 and is now the home of about 200 Pgaz K'Nyau. It was officially registered as a 'key village' (No. 8) in 1983, thereby gaining permanent settlement status and access to government infrastructure. The village once had land inside the Nam Tok Mae Surin National Park, but this land had to be abandoned due to pressure from the RFD. The village boundary now is the boundary with the National Park. The total area of the village is 1,700 ha, of which 64% is conservation forest and 36% is used for agriculture. In the late 1990s on average only about 5% of this land was used each year (because the villagers practice rotational swiddens). Farmers are pressurized by the RFD to cultivate as little land as possible. This means that fallow areas older than three years cannot be used. As fallow periods become shorter rice yields decline due to gradual loss of soil fertility. Attempts to extend the fallow period by the villagers (by including a larger number of older fallow areas in their rotations) are forbidden by the RFD as they consider land on which trees have regrown to be forest land. The policy of the Mae Hong Son Governor is to allow only two-year fallows on highlands. The RFD has declared fallow areas to be permanent forest areas if there are trees with breast height diameters of more than 10 cms. In addition, two permanent upland fields are allowed.[60] Although in the above example rotational swiddening is not specifically outlawed, restriction of the fallowing period to just two or three years does effectively spell the end of swiddening due to loss of soil fertility, since in most forest environments the fallow period should be at least six years.[61]

Villagers in the ethnic group highland areas thus face very strong land insecurity, never knowing when the land they need for subsistence will be confiscated by the RFD. There is a clear conflict between the conservationist outlook of the RFD and the traditional agricultural system of the villagers, despite the efforts that villagers make to ensure that their agricultural practices are sustainable and do not harm sensitive forest areas. It is of course in their own self-interest to do so, but *the government appears to have chosen not to investigate into the agricultural systems of the various ethnic groups to see which are sustainable or unsustainable, or what can be done to adjust these systems so that they cause minimal forest destruction.* Very large areas of land in the Thai highlands have been classified as conservation forest, or wildlife sanctuary or national park without consultation with the local inhabitants or investigation of the detailed situation on the ground.

Although villages may be registered and gain permanent settlement status, this is quite a different thing from land ownership rights. The basic law concerning ownership of land in Thailand is the Land Code of 1954. According to the law, all land belongs to the King, in other words the state. Title deeds (*chanort*) may be obtained for land which has been settled for a long time, which has been surveyed by the government, and which is recognized as being privately owned. Land can only be owned by the state or by individuals, and non-Thais are not permitted to own land under the law. All mountain land is "out of bounds", though this not enforced because thousands of mountain villages have been included in the Royal Gazette, which ensures their right to permanent settlement. Protection and conservation policies have increasingly restricted access to conservation forest land. [62]

The Forest Act B.E. 2484 (1941) defines "forest" as any land which is not yet occupied by anyone according to the law. Since agricultural land and land upon which houses and other buildings are standing has presumably become private property, almost all other land except wasteland will be forest. The RFD was founded in 1896 and in 1899 ownership and control of all forests was transferred to the RFD.[63] The private ownership of land in reserved forest areas, protected forest areas, national parks and wildlife sanctuaries is prohibited by law. Gaining ownership of such areas by individuals is impossible under the current laws. In some circumstances, individual ownership rights of relatively small areas of land which have become permanent upland fields or wet rice fields has been permitted, and some Pgaz K'Nyau and other ethnic group people have ownership

rights over permanent agricultural land. No communal ownership rights or use-rights of forest land is recognized under current Thai law. The status of forest areas which are fallowed for the forest to regenerate over a period of several years, as in the rotational swiddening system, is problematic under Thai law as it seems "doubtful" that anyone would retain any right to the land once evidence of use had effectively disappeared.[64] In some Pgaz K'Nyau villages, the people plant hedgerows around fallow areas, or slash the fallows and grow a few vegetables on them each year, just to show that the land is being used, in the hope that this will prevent the land from being confiscated by the RFD in spite of the fact that use of the land may be technically illegal.[65]

The 1997 Thai Constitution (as above) gives some hope in the form of decentralization of government functions, community management of natural resources, public participation, and public consultation in the case of state activity which might affect the life of a community. The notion of community management of forest areas as one solution to the problem of legal status of forest areas inhabited by ethnic groups has been mooted since at least the mid-1970s.[66] In 1991, the RFD drafted a Community Forest Act which implied that RFD would allow forest settlement and relinquish control over the nation's forests in favour of natural resource management by local communities. In 1993, the community forestry section of RFD formulated a Thai Forestry Sector Master Plan which stated that, "Local communities and individual villagers will have decision-making powers entrusted to them concerning the forest resources they depend on." The plan also dictates that any relocation must be on a voluntary basis only.[67] The plan has never been implemented. A newly drafted Community Forest Act was approved by the Thai Cabinet on 30 April 1996, and by the Council of State (the lower house) on 7<sup>th</sup> November 2001. The bill was then sent to the Senate for approval, on 15<sup>th</sup> March 2002, the Senate passed the bill after making amendments to three crucial articles, 18, 29 and 31 of the draft bill. The Lower House should then have considered the amended bill, and if the Members of Parliament did not agree with the Senate amendments, a joint committee should have been formed to study the bill again, but this has never happened and the bill is now in suspended animation.[68]

The draft bill states that any group wishing to submit a request for the establishment of a community forest must consist of at least 50 adults who are over the age of 18, must be from a traditional community native or indigenous to the area that has been active in forest preservation for at least the previous five years, and must prove that the community's way of living is in harmony with the forest.[69] The Senate amendments to Article 18 of the draft bill would have increased the number of proponents from 50 to 100, excluded community forests in protected forest areas such as watersheds, wildlife sanctuaries, and would have altered the time frame for forest conservation activity 'to at least five years before the bill takes effect'. These amendments would make the bill almost meaningless to forest-dwelling ethnic groups, many of whom have been very disappointed by the actions of the Senate. Clearly the devolution of forestry management rights to local communities is still too sensitive a political issue in Thailand.

Maneekul et.al. describe a procedure for designation of community forests in certain national forest reserve zones (but not in areas such as National Parks, Wildlife Sanctuaries and Watershed Class 1A areas) which is already being implemented. The procedures are difficult, but not impossible. Passing of a Community Forest Bill into law would probably not make the application procedures any less complex, but might allow for community forest management in all ethnic group areas, and therefore the alleviation of anxieties over land use rights as well as a far greater possibility for the continuation of traditional agricultural systems and ways of life for those who wish to do so.

As stated above, the Thai government, mainly in the form of the RFD considers all traditional ethnic group agriculture in the highlands to be destructive of the forests because forest cover is reduced by the felling of trees and the burning of areas of the forest. We have seen above that with regard to the rotational swiddening system of the Pgaz K'Nyau, the Phloun and the Lua this is an

oversimplification. In this agricultural system trees may be cut, but they are cut at a height of about 30 to 50 cms. above ground level, leaving a tall stump which is able to put out new stems quite quickly; the tree does not usually die. Other large trees may be pruned to prevent shading of the crops in the field, but are not felled. Once cultivation has taken place for one year, that plot is then fallowed to allow the forest to regenerate. Since Pgaz K'Nyau villages have remained in the same location for over two hundred years, it is plausible that the system is largely sustainable over long periods. Two problems remain, however, since it is claimed that serious soil erosion occurs as a result of swiddening, and that population growth will result in expansion of cultivated areas and eventual forest destruction.

Research on soil erosion in rotational swiddens and fallows has shown that the overall rate of erosion is less than 0.1 tons/ha/yr on swiddens, *which is a very low rate of erosion indeed, and one which has no effect on water quality in the environment.* and not more than 0.05 tons/ha/yr on fallows of age one to six years. The research was carried out over five months in four different villages. Very little difference in erosion rates was found between different villages. An RFD report states that the rate of soil erosion in shifting cultivation is 0.8 tons/ha/yr, and that in mountain virgin forest the rate of soil erosion is 3.1 tons/ha/yr.[70] Since the rate of soil erosion is likely to increase during the year of cultivation, when the soil is exposed to direct rainfall, sunlight, wind and to human interventions such as weeding, the shorter the fallow rotation period the greater the average rate of erosion will be. To maintain erosion rates at a minimum, a rotation period of about six to ten years is thought to be necessary, depending on the properties of the individual site.[71]

Erosion occurs to some extent in any forest, especially in the mountains, where very steep areas are especially prone to erosion.[72] That the erosion in the swidden-fallow system is at such a low level is a remarkable testimony to the ability of the rotational swidden farmers to ensure minimal impacts on the environment as a result of their intervention in it. Tapp, writing in the mid-1980s reports that the most serious causes of erosion in the watersheds were poor road construction and mining, especially of tin. It was only in places where mines or roads had been constructed that serious siltation of mountain streams had taken place. At the same time, Tapp notes that, "Fallow swidden areas continue to be planted with pines by the Forestry Organization, which still plants teak on good farming land rather than on the slopes where it would be most effective in preventing soil erosion." [73]

The RFD seems to have, in 1971, attempted to fudge the issue of ethnic group population and forest destruction by claiming that forest encroachment and poaching was primarily caused by shifting cultivators or *chao khao* (a Thai pun that can mean both "mountain people" and "other people"), who made up 13% of the farmer population of approximately 20 million. Since ethnic groups made up less than 1% of the population, or approximately 250,000 people, less than 10% of shifting cultivators were ethnic group people. 90% of the swiddeners must have been Thai, In spite of this, the term "shifting cultivators" as used by the RFD continues to imply forest-dwelling ethnic groups. In fact, until the end of the 1950s, swiddening was widely carried out by Thai farmers in relatively flat forested areas.[74] Fallowing periods of 5-20 years were necessary to allow for regeneration of the secondary forest and it is thought that the "carrying capacity" of land under such a cultivation system was 8 people per 100 ha! In the 1960s there was a massive explosion of upland fields at the expense of forested areas. Between 1962 and 1973 upland field areas in Thailand more than tripled from 978,000 ha (6.144 m rai) to 3, 350,000 ha (20.938 m rai), primarily associated with loss of forest cover in northeast Thailand. With the onset of modern chemical and mechanized farming, chemical fertilizers were used to prop up the fertility of the soil and traditional swidden practices were abandoned.[75]

With regards to population growth among ethnic groups and deforestation, the assumed causal

connection between the two factors does not stand up to scrutiny. While export-oriented cash crop production was being promoted in Thailand between the 1960s and 80s, expanding areas for sugar cane, kenaf, cassava, and maize production in the north-east were a major cause of deforestation at a time when deforestation reached crisis proportions in that region.[76] In the north, ethnic group population growth rates were quite stable in the 1970s and 80s, but the rate of forest loss increased rapidly. This is explained by a "massive expansion" of logging concessions for clearcutting that were re-granted in the 1980s.[77]

However, in areas of forest under swidden cultivation an inverse correlation between population growth and area of forest utilized for swidden agriculture may be found. In one village, the number of households rose from 10 to 14, but the area of swiddens fell by 10%. There were two reasons for this decrease in land area use. One was that a method for preventing the spread of forest fires (vigilance and the preparation of firebreaks) had been developed over the previous 50 years which resulted in a reduction of cultivated land area by preventing damage to fallowed areas. The second was that the Watershed Conservation Unit (part of the RFD structure) for the area had prevented villagers from cultivating certain areas. As seen above, the expansion of protected areas into village lands is a major destabilizing factor for swidden farming. For the Pgaz K'Nyau, in the event of a land shortage newly-wed couples can choose to live with the parents whose village has the greater availability of subsistence land, and rice productivity of the swidden can be increased by intensification of production, i.e. by increasing labour input.[78]

Swiddening agricultural systems are frequently a composite of land-use types; swiddens, fallows, vegetable gardens, wet rice fields, plots for growing cash crops such as opium, and forest areas for gathering forest products for direct consumption or for sale. The balance of the use of these (more will be said about this below) depends on the endowments of the local environment. For example wet rice cultivation is more productive per area of land than swiddens, but some mountain villages have very limited flat land or water resources that can be used to construct and utilize wet rice fields effectively. Villages far from markets will tend to rely less on cash transactions and so will grow less cash crops, and so on. Each village adapts to its own needs within its particular environment, and in each village the total swiddening system is not static but adjusting among the different elements of land use according to pressures from within (e.g. population increase) and from outside the village (e.g. watershed protection policy, penetration by the consumer economy).

Swiddens have been described as "multiple cropping organic farming systems" – they are more productive than wet rice fields in terms of labour input and produce not only rice but diverse other foods (vegetables) and medicinal plants, which deliver not money but food security and a lower risk of calamity, and which are used in combination with other production systems, wet rice cultivation and so on.[79]. The whole system forms a "composite economy" which constantly readjusts itself in response to internal and external pressures and changes to produce the configuration perceived to be most conducive to food and livelihood security. Villagers attempt to keep the swiddens to fixed areas while expanding wet rice cultivation and other systems. The Pgaz K'Nyau have very detailed knowledge of the forest ecology and know where swiddens will be most productive. They know it is not "profitable" to expand swiddens into less fertile areas of the forest or onto areas of an ecologically sensitive nature. Swiddens do not therefore expand with increase in population to destroy the surrounding forest.[80]

A well-known Pgaz K'Nyau elder Joni Odochao has stated concerning the notion that population increase would eventually result in destruction of the forest in his native Nong Tai village, in the Mae Wang river basin in Chiang Mai, where the population has tripled over the last century:

*"Contrary to the belief that increased population leads to a decrease in forest area, the rotational farming area has decreased while the preserved forest area has increased,*

*because the forest-dwelling communities know how to adapt to the changing relationships of natural resource use and evolve mixed agricultural systems. If villagers have a clear land-use framework with regard to forest and agricultural areas, then they can utilize the land more efficiently without encroaching on sensitive areas. If the RFD can change its role from that of evicting villagers to supporting their livelihoods, the villagers can adapt to live in the forests."*[81]

Current research suggests that average annual population growth rates in Pgaz K'Nyau villages is at around 2% per year. A sample of seven villages had population growth rates between 1.49% and 3.74%. (I was told at this village with a growth rate of 3.74% that current family sizes are about four children, but in the previous generation they were 8-10 children.) The average growth rate of the remaining six villages was 1.68%. [82]

As the situation stands at present (early 2006), the current policy is to force villagers to shorten the fallow rotation period to far less than necessary for regeneration of the forest and the soil fertility, or to abandon swiddening altogether. In its place, villagers are encouraged to shift agricultural practices towards permanent upland fields and wet rice fields, both for subsistence and for the production of cash crops. This is the topic of section I.4.

#### **I.4 The introduction of cash crops for the lowland Thai market**

The notion of removing forest-dwellers who carry out "shifting cultivation" from forest areas was condoned by international organizations such as the Food and Agriculture Organization (FAO) in the 50s, long before commercial logging became a problem connected with serious deforestation, and had a strong influence on Thai conservationist thinking. When the national park system was being set up in Thailand in 1959 to 1960, an American advisor, George Ruhle (a representative of the International Union for Conservation of Nature and Natural Resources and the American Committee for International Wild Life Protection) wrote:

*"What to do about the unassimilated non-Thai tribes of the forested highlands is a pressing problem. It is folly to overlook their existence, for their mode of living and shifting cultivation destroys critical watershed and poses a serious threat to the water and soil resources of the lowlands upon which the nation's future welfare depends... It is essential that these tribes be stabilized as soon as possible; at the same time, retention of their identities and customs should be encouraged."* [83]

Thus in order to protect the watersheds at the head of the nation's main artery, the Chao Phraya River, the *chao khao* ("mountain/other people") who practice *rai luan loy* ("drifting cultivation"), which by nature is "ungovernable", "unstable", "directionless", "rootless", "disordered", had to be brought under control by whatever necessary means in order that the state could exercise its proper authority over the watersheds and their resources. Despite Ruhle's concern for the ethnic peoples identities and customs, conservationist thinking in Thailand concluded that resettlement and permanent field agriculture was the policy answer to their *rai luan loy* "problem". Deputy Director General of the RFD in 1966, Krit Samaphuddhi stated:

*"Shifting cultivation extensively practiced by the hill-tribes of the North, and illicit clearing of the forests for cash crops by local villagers constitute one of the major problems in forestry. The measure employed to curb such malpractice is by vigilant patrol of the vulnerable areas and by the establishment of large settlement areas of the landless cultivators by gradually colonizing them and letting them settle down to permanent cultivation."*[84]

It should be noted that the construction of roads, mines and dams, and the removal of forest cover

by commercial logging in forest areas were not considered problematic since these were activities carried out by known institutions and organizations, governed by laws and regulations controlled by the state establishment, and fitted comfortably into the rubric of "development". Non-Tai ethnic groups living in the mountains having different cultures and languages (*chao khao*, *Karen*) and practicing an apparently inherently unknowable and ungovernable agricultural system, and whose "profession it is to destroy the forest", therefore had to be transformed into Tai-like *chao rai* (upland field cultivators) who practice "normal" *tham rai* (cultivation of permanent upland fields) by resettlement and/or changes in their land-use patterns.[85]

Since wholesale removal of over 800,000 (currently) ethnic group people from the mountain forests is now clearly unrealistic, the main weight of policy implementation has come down on the side of the transformation of ethnic group agriculture from traditional subsistence swiddening systems to modern chemical and mechanized farming for cash crops for the market. As shown above, the principal method for achieving this aim in a Pgaz K'Nyau village is for the RFD, in the form of the local Watershed Conservation Unit, to demarcate a large part of the village swidden fallow area as protected forest. The traditional rotation system then breaks down and often villagers who insist on trying to preserve their traditional farming system will have to do so with a rotational period of two to four years. Even this could lead to confiscation of the land in places where secondary forest regeneration is rapid. The use of remaining areas available for cultivation as permanent fields, or in some cases the construction of wet rice fields is then encouraged or required. As noted, Pgaz K'Nyau farmers will adapt their cultivational practices to meet subsistence and cash needs with the land and water resources available. This means that some farmers will quickly see benefits in more intensive cultivation of the land; reduced fallowing or effective abandonment of fallowing, more intensive labour input, the use of chemicals, and the use of machinery where possible.

The research report on rotational swidden agriculture commissioned by the Thai Ministry of Agriculture and Cooperatives in April 2001, coordinated by the Chiang Mai University Faculty of Social Sciences, and published in October 2004 carried out research in 11 villages (nine Pgaz K'Nyau villages, one Phloun village and one Lahu village) shows that there is a great deal of diversity among villages. The villages were divided into three groups according to their current swidden practices: The first group is carrying out traditional rotational swidden farming without many changes, the second group farms with some adaptations to the rotational swidden practices, the third group is no longer carrying out full rotational swiddening and has undergone major changes in its cultivation practices. However, even among the villages in the first group some permanent-field cash cropping and wet rice cultivation (including on purchased wet rice fields outside the village territory) was occurring, and in the third group, consisting of four villages, one village had totally ceased to do rotational swiddening, and two villages had rotational swidden systems of one to two year fallow periods. The fourth village, the Lahu village, which had been forced to relocate, was able to maintain a swidden rotation system with a rotation period of 8-10 years, but were using swiddens for two or three years consecutively, followed by a four to five year fallow period. This gave very poor rice yields. In addition, this village had no wet rice fields and so was effectively dependent for subsistence on permanent fields, where a certain amount of cash cropping was carried out, plus income from employment outside the village.[86]

The kind of crops that are being planted now as cash crops are cabbages, Chinese cabbages, lettuces, shallots, coffee, and some flowers and decorative plants. In one village, the farmers have chosen to turn over a part of their former swidden lands to growing feed maize on contract. This is because this method does not require individual farmers to put up a large amount of capital. A trader brings seed and other items to the village and "lends" them to the farmers. He recoups his costs when he buys the produce. The production process is very low-tech and the farmers can produce the maize using a farming method similar to that which they used formerly for growing dry rice; burning the

field, sowing the seed, weeding and harvesting. The only machinery used is a shelling machine for the final product, and in most cases the machine belongs to the trader, who brings the machine in to process the maize, bag it, buy it and then transport it out of the village. The market and the price for the product are quite stable and so there is much less risk involved when compared with other cash crops, which is a good point for the Pgaz K'Nyau, who tend to be rather risk-averse.

Lastly, it is useful to look at the land areas once used under full swidden rotation systems and under permanent field systems when considering the changes in land use. Land use changes in the village where rotational swiddens have been completely abandoned are as in the following table. Half of the former swidden-fallow lands were re-designated as forest land. The villagers were then directed to change to modern farming methods on the remaining half of the area. About 38 ha of that area has become fruit orchards and the remainder (approximately 394 ha) has become permanent upland fields. The area of wet rice fields has not changed because following an enlargement in 1957 there is now very little remaining scope for further enlargement of rice fields in the village. Living areas have expanded slightly due to population increase. In fact the population increase has been greater than suggested by this enlargement, but many young people have left the village for the towns in search of educational opportunities and employment, and many have settled permanently in the towns.[87]

**Table 2: Change in land use areas in a village where rotational swiddens have been completely abandoned (ha, %)**

Type of land	Before (up to 1980s)		After (1990s)	
	ha	%	ha	%
Forest	712	39.5	1136	63.0
Swidden-fallow land	864	48.0	392	21.8
Wet rice fields	160	9.0	160	9.0
Orchards and vegetable gardens			40	2.2
Living areas	64	3.5	72	4.0
Total	1800	100.0	1800	100.0

Of the former swidden-fallow land, only a maximum of one seventh of it was used in any particular year; approximately 120 ha. The current permanent upland fields are generally used to grow at least one crop a year, and even though there may be some unused fields in the village, around 400 ha of land is used to grow at least one crop a year. Clearly, despite intensification of land use, land areas cultivated each year have risen dramatically. Previously, the swiddens were fallowed after only one year of use and not returned to until the fertility of the land had regenerated. The whole system was essentially sustainable. The current farming methods on the permanent fields are not sustainable in the long run.[88] A more detailed comparison of the two systems is the topic of the next section.

**II. Discussion of permanent upland field system with comparison with the traditional swidden rotation system[89]**

Where former swidden-fallow land has been transformed into permanent upland fields, the crop rotation system used in the field will depend on the availability of water for irrigation. A typical two-year crop rotation system for a field with water availability is as follows:

Year 1			Year 2	
January – April	May – August	September – December	January – April	May – December
Cabbage	Shallots	Cabbage	Cabbage	Dry rice
Lettuce		Lettuce	Lettuce	
Chinese cabbage		Chinese cabbage	Chinese cabbage	

A two-year crop rotation system for a field with no water availability (rainfed field) would be as follows:

Year 1			Year 2	
January – April	May – August	September – December	January – April	May – December
Fallow	Shallots	Cabbage Lettuce Chinese cabbage	Fallow	Dry rice

Villagers also rotate fields, a system devised from their experience with rotational swiddening, but dare not leave fields fallow for more than a few years for fear of losing the land to the RFD. Even if they do fallow for several years, they will clear the land each year to make it apparent that the land is subsistence farmland and not part of the forest. Some villagers fallow land for three years, but find that that is not enough to recover fertility sufficiently as the time is too short for the secondary forest to grow back sufficiently. Two forms of rotation are used. Large fields are often divided into sections (generally four) and each section is cultivated in order. Cultivation may also be rotated between several small fields. There are also so-called "reserve fields", which are former fallow areas not included in the protected forest, which the villagers used to include in the swidden rotation system, but which are not currently being used. Villagers clear these areas each year so that they will become "degraded forest" areas that will be available in the future for use as permanent farmland. No profitable use is made of these "reserve fields" now, but the villagers say that if they do not clear the fields each year and allow the forest to reclaim the land, they fear they will not be able to use the land in the future, because the RFD will re-designate the area as permanent forest. Thus there is a certain amount of land in the villages which is cleared, but abandoned and not made use of, and yet cannot be returned to the forest to fully regenerate fertility. Because land which becomes permanent fields (whether wet rice fields or upland fields) is owned by individual farmers, these farmers try to expand their holdings as much as possible in order to try to procure some kind of security for the future.[90] Traditional rotational swidden farming systems have been characterized as being "wasteful" in terms of land use, but the new policy arrangements have turned out to be far more wasteful of available resources.[91]

Because the permanent fields are generally used to grow at least one crop a year, chemical fertilizers must be used to maintain soil fertility at a good level in order to obtain a crop. Examples of chemical fertilizers are shown in Table 3. In fields which are close to water sources and can use water all year round, four growing seasons are possible. That means 8-12 applications per year. Where water is not available year-round, there will be two growing seasons, or 4-6 applications of chemical fertilizer per year. Villagers say they were using more chemical fertilizers each year and have noticed that the soil quality has been worsening (lower yields, worsening weed and insect problems). Three points should be noted. The first is that chemical fertilizers are not used in traditional rotational swiddening. Where fallow periods have been reduced to four years or less villagers used some chemical fertilizers to try to maintain soil fertility. Secondly, chemical fertilizers are not used on the dry rice grown on upland fields at the end of the two-year crop rotation cycle as this is considered to be a catch crop (makes use of the fertilizers remaining in the ground from previous crops) and is usually for subsistence, not for sale. Thirdly, the trend is now to buy more natural (organic) fertilizers in the local markets to reduce the use of synthetic (chemical) ones, or are making their own compost from pig and water buffalo faeces and waste plant materials. Villagers are aware that this is a slow movement towards eventual organic farming styles.

In addition to chemical fertilizers, a wide range of chemicals such as pesticides and herbicides are used, a sample of which is shown in Table 4.

Insecticides are problematical as they appear to be overused in the hot/dry season (November to April). Labels state that applications should be limited to one every 7 days, but farmers are actually applying insecticides every three to four days. In a three-month growing season, that would amount to between 20-30 applications. Farmers note that insect problems are worse in some dry years. The

rainy seasons have been becoming less regular and this has made it difficult for the farmers to predict weather conditions and time insecticide applications appropriately.

**Table 3: Chemical Fertilizer Use on Different Crops**

Crop	Type of Chemical Fertilizer			No. of applications per growing season
	Immediately before or after planting	During crop growth	When the crop is approaching maturity	
red onion (shallot)	13-13-13	15-20-0	13-13-21	3
cabbage	16-20-0	15-20-0	15-15-15	2
lettuce	16-20-0	15-20-0	15-15-15	2
sunny lettuce	16-20-0	15-20-0	15-15-15	2
cos (romaine) lettuce	16-20-0	15-20-0	15-15-15	2
Chinese cabbage <sup>(1)</sup>	16-20-0	15-20-0	15-15-15	2
Chinese cabbage – michilli <sup>(2)</sup>	16-20-0	15-20-0	15-15-15	2

(1) Brassica pekinensis  
(2) Brassica pekinensis Linn.  
(N-P-K, approximately 300 kg/ha/yr used)  
Cost: e.g. 16-20-0 + 2CaO + 15S, a 50 kg bag = 520 Baht (1 Baht = 3 JPY, US\$1 = 40 Baht)

**Table 4: Agricultural Chemicals: Type of chemical, property, and frequency of use**

Type of chemical	Name of chemical	Chemical name and property	No. of applications per growing season
Weed controller	salt (NaCl powder)	weed germination suppressant	2
	Goal 2-E	Oxyfluorfen: selective pre- and post-emergent herbicide	2
Herbicide	Roundup	Glyphosphate: EPSP synthase inhibitor	2
	Gramoxone	Paraquat dichloride, non-selective, contact herbicide	2
Insecticide	Endosulphan	non-systemic insecticide and acaricide with contact and stomach action	On average 1-2 times per growing season in the rainy season. One application every 3-4 days in the dry/hot season.

No synthetic chemical pesticides or herbicides are used on traditional swiddens. In swiddens where the fallow period has dropped to one to two years, and which are sometimes used to grow cash crops, the soil becomes infertile in a few years. Chemical fertilizers are used in large amounts in these fields, and powdered salt, as a weed controller, is sometimes scattered around crop plants to suppress weed germination.[92]

The use of chemicals for crop production makes the farmers very dependent on cash inputs brought in from outside the village. Whereas traditionally Pgaz K'Nyau traded mainly for salt and metal items (knives, axes), they are now much more integrated into the cash economy through the need to buy cash inputs for crop production, which often requires credit to get started at the beginning of each crop season. In turn this translates into a need to produce cash crops for the market in order to earn cash income (more below). Villages which were "encouraged" to shift to permanent field farming earlier (in the early 1980s) were given help from domestic and international agencies to find appropriate cash crops to grow, and were given technical and financial assistance. Some of these villages have done quite well in terms of household cash incomes. Other villages, those which

were forced to give up large parts of their fallow areas and shift to modern forms of cash crop farming at a later period were not given assistance and therefore had very little capital or know-how with which to make a start in cash cropping. One of these villages, studied in the research coordinated by the Chiang Mai University Faculty of Social Sciences, grows no cash crops at all and has to rely on employment outside the village. This is day-labour in fields in other villages or work in local resorts or tourist spots, and is very insecure. Villagers are almost completely dependent on this outside source of funds and are unable to accumulate capital which might help them to build more stable incomes.[93]

Traditional swiddens, as noted above, are more than just upland dry rice fields. A large number of traditional vegetable and medicinal crops, as well as particular varieties of flowers, are also grown around the field, intercropped with rice, which itself may also consist of at least two different varieties, usually a glutinous and a non-glutinous variety. Other food plants grown in swiddens include varieties of yams, taros, potatoes, sweet potatoes, pumpkins, melons, squashes, luffas, egg plants, mushrooms, sugar cane, beans, maize, millet, chilli peppers, sesame, and so on. Upland glutinous or non-glutinous rice varieties grown in any one village might number 20 or more varieties, 30 or more when wet rice varieties are included. A study of the eating habits of the Pgaz K'Nyau in the Mae Chaem area showed that the Pgaz K'Nyau gather over 110 different kinds of food vegetable plants from swiddens and forest areas.[94] Permanent wet rice fields and upland fields are very different. Wet rice fields only provide the rice that is being grown, and permanent upland fields are generally only planted to one crop. Some of the food plants harvested from traditional swiddens require specific conditions in terms of soil condition and fertility, (such as *haux wauif* – dark opal basil – and some mushrooms which require logs or ashes on the soil in order to grow) and will not grow when the fallow period is reduced to four or less years, let alone in permanent fields. Some of these plants are vines, such as some tubers and beans, and therefore need support on which to grow, but since there are no trees or bushes in the permanent fields, they cannot be grown.[95] For the Pgaz K'Nyau this represents 1) a gradual loss of traditional food plant biodiversity, 2) the loss of locations in which to plant or harvest traditional food plants, and 3) loss of nutritional balance and food security which these food plants provided. Virtually the whole of traditional food culture, food plant biodiversity, and the cultural landscapes associated with it are in danger of being irretrievably lost over the next few decades.

It is useful at this point to cite a number of traditional and more recent ways in which Pgaz K'Nyau villagers have tried to adapt to the loss of subsistence land and the need to gain cash incomes. This list (Table 5) is not exhaustive, but it covers the main strategies Pgaz K'Nyau villagers use to solve such problems. All of these methods have been tried at some time, with varying degrees of success. The list tends to start with the more traditional adaptive practices at the top and move down to the more recent ones at the bottom.

The table gives quite a good picture of what is actually occurring in the Pgaz K'Nyau villages now, or is going through the villagers' minds as they face problems of subsistence land loss and coercion to change farming methods. The swidden fallow rotation period, with very few exceptions, is declining, more and more permanent fields are appearing, more people are growing cash crops for the market, and many are finding innovative ways for making cash incomes from their local resources. More non-local inputs are being used, especially agricultural chemicals, which have deleterious effects on the soil, water and human health.

**Table 5: A list of strategies used by the Pgaz K’Nyau to adapt to the loss of subsistence land and the need to gain cash incomes**

1. Increase the area cultivated	Generally, this is not an option. All parts of the forest are not equal, especially in terms of the soil, the natural plant community, or the microclimate. The Pgaz K’Nyau know their village surroundings very well. They know which areas are suited to cultivation, which areas would not cultivate well, and which areas should be protected in order to protect water sources and so on. Areas where swiddens are cultivated are well known to the villagers and they do not expand these areas.
2. Move several households to a new location and start a "sister village"	This is the traditional solution, but the land horizon is now closed as any land that is still uninhabited is a restricted area. There are now no places left where a new village can be established.
3. Construct irrigated wet rice fields or increase their area	This is one of the preferred options. However, suitable land and/or water sources are usually very limited in the mountains. Some villages can construct fairly large areas of paddy fields, others can construct only small areas. An extension of this strategy is for villagers to buy paddy fields in a nearby village that has more flat land. This is happening in some locations.
4. Decrease the rotation period (to increase the area cultivated each year)	This is an option which is taken, but not preferred, because it results in the slow degradation of the land. It is not sustainable, and the villagers know it.
5. Gather saleable items from the forest and sell them for cash with which to buy food	Some villages which inhabit a suitable forest area are now quite reliant on this. Examples are bamboo shoots and mushrooms. Some villages have quite profitable tea gardens in the forest.
6. Raise livestock which are later sold for cash	Some households are doing quite well with this. Pigs are raised around the house. and cattle can be grazed in fallows or in the forest, for example.
7. Borrow money and attempt to return it when the situation improves	As in all rural areas of Thailand there is some debt. Villagers rely on credit to buy cash inputs before production. Average debts can be as high as 65,000 Baht or as low as 2000 Baht, depending on the village and economic level of household. [96]
8. Look for local employment opportunities to earn money and then buy food	Some villages are now very heavily reliant on this. Day-labour employment can be very irregular and insecure.
9. Turn some of the fallow areas into permanent fields with which to grow cash crops for sale	Some villages are now either wholly or partly reliant on this. In some places this has been forced upon villagers by forest authorities.
10. Start up some business in the village with which to earn cash for buying food	A few villages which have the requisite skills or geographical conditions and so on are doing quite well with this. Examples are eco-tourism and traditional weaving.

### III Advantages, Disadvantages and Impacts of Permanent-Field Farming

#### *Advantages*

- 1) The clear demarcation of forest land and cultivated land and the commitment by villagers not to expand cultivated land has led to decreased tension between villagers and RFD officers and other representatives of authority, and decreased anxiety over land rights.
- 2) Where sufficient support has been given to the villagers to make the change from subsistence farming to cash crop farming, many villagers have been able to make good cash incomes, resulting in a materially higher standard of living.
- 3) With the coming of roads and other infrastructure to previously remote areas (and with increases in cash incomes) it has become possible for villagers to purchase vehicles, usually pick-up trucks

and motorcycles. This has made it much easier to transport produce to market. It has also released the villagers from the traditional labour of carrying rice from the swiddens back to the village after harvest, a job that could take several weeks if the swidden is distant from the village.

#### *Disadvantages*

- 1) One of the biggest problems for Pgaz K'Nyau villagers when making the shift to cash cropping for the market is getting used to the market system; dealing with the intricacies of cash transactions, getting to know and finding a place in the local market system, dealing with price fluctuations due to gluts and shortages, and dealing with the psychological pressures of a high-risk system. Prices for shallots varied from 5 to 20 Baht/kg, and prices for cabbages from 0.8 to 10 Baht/kg. Generally, the higher the possible selling price, the greater the risk. One villager said that if he planted cabbages on 10 rai of land (1.6 ha) he reckoned that 7 rai would pay for the production costs, 2 rai would be lost (to pests, inclement weather, or due to a drop in selling price, and so on) and 1 rai would provide cash income for the household, but from the above price ranges he could also very easily end up not even being able to cover his production costs.
- 2) Villagers recall how when they first changed to permanent field cash crop farming the cash inputs were very low because they did not need to buy chemical fertilizers, herbicides or pesticides, and labour costs were very low because there was still a lot of labour exchange taking place. After several years, however, the soil started to become less fertile and more and more money had to be paid out for chemical inputs to provide nutrients for the plants and solve weed and insect infestations, and so on. Production costs are thus rising and villagers see no available alternatives or easy way out of the situation.

Although impacts on Pgaz K'Nyau communities of changing from traditional rotational swiddening agriculture to modern, permanent-field agriculture are intricately interrelated, they can be classified as follows:

- \* Environmental Impacts
- \* Economical Impacts
- \* Social Impacts
- \* Cultural Impacts
- \* Impacts on Health

Each will be dealt with briefly below.

#### **III.1 Environmental Impacts**

- i) Loss of green areas which were formerly swidden areas. Permanent fields are not fallowed for long periods of time, certainly not long enough for secondary forest to regenerate. There is no tree cover, and during the hot/dry season (November to April) much of the land is parched and a bright red colour.
- ii) Degradation of soil structure and soil quality. In the hot/dry season, the soil is extremely hard, almost impossible to plough. In the wet season (May to November), the soil quickly turns to mud and is very slippery. Villagers say that compared with twenty years ago, crops do not grow as well, and now it is necessary to put down chemical fertilizers to get any crop at all. Villagers know that using more and more chemical fertilizers each year cannot continue long into the future and thus are looking for alternative methods, such as the use of organic fertilizers.
- iii) Increase in weed and pest infestation and the increasing need to use herbicides and pesticides in order to solve weed, pest, fungi and disease problems.
- iv) Chemical residues in soil, water and plants. Villagers note the reduction in numbers of birds and fish. Streams are no longer considered safe for drinking, bathing or washing clothes in. Cash

crops which are not sold are thrown away as they are not considered safe to eat. This is another incentive to move towards "organic" farming.

- v) Degradation of streams and expanded use of water. Because fields, some of which are on quite steep hillsides, are now permanent and not fallowed for long periods, and in addition are hoed when cultivated (turning over the soil), villagers note that there is more topsoil runoff and therefore more sediment in streams. Streams are becoming shallower than before and some have to be dredged to keep them flowing, something that never happened in the past. At the same time, in order to use the fields more intensively, by planting crops in the dry season, villagers are diverting water from streams using water channels and pipes, thus making less water available lower downstream. This must surely be exactly what the forestry policies were supposed to be designed to avoid.
- vi) Loss of pasture. In villages where remaining swidden-fallow areas have become very small, and where cash crops are grown on them as well as on permanent fields (and where the protected forest is off-limits to the villagers), the loss of year-round pasture has made it very difficult to raise water buffalo and cattle. Wet rice fields can be used after harvest but not for very long. Villagers sometimes encroach on land belonging to other villages, and this sometimes causes disputes.
- vii) Loss of traditional and wild food plants harvested from swiddens and fallows, as mentioned above.

### III.2 Economic Impacts

- i) Rising costs of production. All costs of production are rising; equipment costs, labour costs, cash input costs, transportation costs. Since crude oil prices rose above US\$40/barrel in July 2004, gasoline and chemical prices have increased, making increasing applications of chemical fertilizers, herbicides and pesticides even more problematic than previously. Some examples of production costs for main crops are given in Table 6.

<b>Table 6 : Production Costs for Main Crops</b>		
<b>Crop</b>	<b>Production Cost</b>	
	<b>Baht/rai</b>	<b>US\$/ha</b>
Wet rice	120-920	20-150
Upland rice	50-220	8-35
Maize	540-800	90-130
Cabbage	10,190	1675
Shallot	17,635	2900
<i>Notes: 1 ha = 6.25 rai, US\$1 = 38 Baht (figures rounded to nearest \$5)</i>		
<i>Source: Ganjanapan, p221</i>		

Production costs for tea in forest plantations are about 5 Baht/rai (US\$0.16/ha). Cash production costs for rice in traditional swiddens are effectively zero.[97] Rising costs of production have forced villagers to take some of the land out of production. Coupled with the "reserve field" problem noted above, this is resulting in land abandonment in some villages. This land has to be cleared each year just as the "reserve fields" have to in order for the farmer to maintain his claim on the land. It cannot therefore be fallowed until it regains its fertility by allowing the secondary forest to regenerate. If the villager does not have time to clear the field he or she may just simply abandon it.

- ii) Loss of fuel wood for cooking. In some places this is quite serious as villagers may have to travel several kilometres to "poach" wood from other villages. Again this leads to disputes with other villages.
- iii) The need to change crops. Continual cropping of a single cash crop can cause soil problems which eventually make it uneconomical to grow the crop. Some villages have been through two changes, for example starting with red beans, going onto cabbages, and then to shallots as

problems occur with each crop. Villagers say that problems are beginning to appear with the shallots and that they will have to switch to a new crop in a few years' time. Each time this happens the farmers have to readjust to a new regime of plant, cash inputs, and marketing, which is all quite different from their traditional style of farming where the same plants could be cultivated for generations.

### **III.3 Social Impacts**

- i) Breakdown of the traditional land-use system. There is no formal ownership of traditional Pgaz K'Nyau swidden and fallow areas, but each household has use-rights to its subsistence lands, which are passed on to the next generation through the mother, as Pgaz K'Nyau society is matrilineal. If land is not needed (e.g. because of fewer family members or out-migration of a family) then the village head can allow another family to use the land. The community is the ultimate arbiter of the use of the land, but families can theoretically hold use-rights to certain areas of land through any number of generations. With permanent field farming, including wet rice fields, it becomes more important to be able to claim an exclusive right over the land, and this is what current Thai law allows and condones. Since in Pgaz K'Nyau villages that maintain a traditional rotational swidden system the management of swiddens is the woman's province and the management of wet rice fields is the province of men, men are now overwhelmingly the formal owners of permanent fields. Further, the recognition of formal ownership rights over land has led to phenomena previously unknown among Pgaz K'Nyau such as leasing or selling of land, especially to people from outside the village. This is technically illegal as land ownership rights in these villages are premised on the non-transferability of the land, but loopholes (such as pretending to lend the land to a relative) exist. Thus the changes in the agricultural methods has led to a total break with former Pgaz K'Nyau social and cultural behaviour.
- ii) Breakdown of labour-exchange. Cash cropping on permanent fields has led to a breakdown of traditional labour-exchange arrangements. In traditional rotational swidden systems families will help each other out with the labour-intensive work of clearing fields, planting rice, weeding, and harvesting. Labour-exchange is a survival strategy implemented by subsistence farming peoples and does not entail the exchange of money. In the permanent field farming system these arrangements are breaking down to the extent that all labour outside the household or close extended family becomes hired labour for cash. Even where some labour exchange is still practiced, if for some reason a person cannot work as promised he or she must pay for a replacement to do the work. This is because timing of field operations has become much more crucial than with swidden farming, and can have a serious effect on cash incomes.
- iii) Water and pollution problems associated with permanent field farming, as mentioned above, may cause severe friction with surrounding villages, especially those downstream. This is exactly the kind of problem that policies were supposed to be preventing, but which would be far better implemented through conscientious community management of natural resources.

### **III.4 Cultural Impacts**

- i) Land use problems. As mentioned above, with the additional issue of the ownership of land which is not in actual use. This causes disputes between villagers as there are some who have not assimilated the new cultural arrangements and are still living in the former cultural "milieu".[98]
- ii) Changes in the gender division of labour. Women are still responsible for the production of rice (now in both wet and dry fields) for household consumption, while men are now the managers of the cash crop fields. However, the men are often too busy looking after the cash crops to help with the heavy work in the rice fields, such as weeding and taking care of the water arrangements for the field. This can cause friction within the family and place a very heavy burden on women.
- iii) Encroachment of the consumer economy. The Pgaz K'Nyau lifestyle has changed very rapidly over the last 20 years as the money economy has pierced deeply into the villages. In the mid-2000s some of the villages near national roads are becoming electrified and the use of

computers and satellite TV is now becoming commonplace along with the use of mobile phones, pick-up trucks and motorcycles. Villages distant from paved roads can apply for solar panel subsidies that will effectively allow them to obtain a solar panel (approximately 1m<sup>2</sup>) kit complete with battery for free. These will run TVs, computers, house lights, and so on. The arrival of TV represents a window on the world for the Pgaz K'Nyau villagers, whose lives are irrevocably changed by the images they see. The young people, especially, find themselves being drawn into consumer society, thus accelerating the need for ever larger cash incomes. For the older generations, who may wish to preserve some of the traditional Pgaz K'Nyau culture, this is an increasingly big headache.

### III.5 Impacts on Health

- i) Health impacts from the use of agricultural chemicals. Frequent use and overuse of chemicals used for the production of cash crops in permanent fields has direct health impacts on users and indirectly affects others through generalized pollution of the local environment. Villagers state that they observe that people in the village with symptoms of blackout, vacant expression, fainting and dizziness, rashes, extensive itching are increasing. Many people have hand, fingernail or toenail problems (Photo 1). Many people have developed allergic reactions to water, air, and soil. One villager stated that he saw a boy lose consciousness while harvesting shallot flowers (for sale) in a field. Villagers assume that these phenomena are caused by toxic substances remaining in the water, air, and soil after the use of chemical fertilizers and pesticides. It is clear that printed instructions on the bags and bottles are not being followed. Even such elementary self-protection such as wearing gloves when handling concentrated herbicides and pesticides are not carried out. One villager said that he cannot read the Thai instructions on the bottle. This was apparently not unusual.
- ii) Heavy and hurried labour year-round. Under the traditional rotational swidden system the Pgaz K'Nyau would rest for about two months, December and January, after the rice had been transported back to the house and until the traditional New Year began again in February. During this time only light work would be done and some families would take the opportunity to visit relatives in other villages. Now that many families are growing both wet and dry rice and also producing cash crops for the market, there is very little opportunity to take an extended break from the hard physical work of farming. In addition, much of the work has to be done quickly because of marketing timings. The production of crops for sale also requires that the farmers do the work carefully and thoroughly in order to produce a good product for the market and hopefully obtain a good price. Marketing itself usually takes a whole day, typically rising early in the morning to get to the market before queues (of farmers trying to sell their produce) become too long, and then returning home in the early evening. Farmers say that under this production regime they are not really better off than they were when they cultivated swiddens, but the life is harder and they feel psychologically pressured because they have to have the cash to buy more things than before.
- iii) Villagers overall health declining. A visit to a village clinic revealed that the number of illnesses treated has risen markedly in recent years when compared with about 20 years ago (the clinic was established in 1986). In answer to a question about the most commonly treated illnesses the author was shown two bottles; one labelled Diazepam, and one labelled Benpene. Diazepam is more commonly known as "Valium" and is "used primarily for short-term relief of mild to moderate anxiety, to relieve anxiety, nervousness, and tension associated with anxiety disorders." The chemically related Benpene, more commonly known as "Librium" (chlordiazepoxide). is a "classic anxiolytic, sedative, hypnotic, and anti-convulsant" and "is used in the treatment of anxiety disorders, for short-term relief of the symptoms of anxiety, symptoms of withdrawal in acute alcoholism, and anxiety and apprehension before surgery." [99] I was told that there had been a large increase in anxiety problems and associated stomach illness. The two kinds of pills are dispensed very often to people who come to the clinic complaining of "*lap daa huu mai lap*"

(Thai: "Try to sleep but hear voices in the head"). The problem is that many of the villagers show strong anxiety symptoms due to problems with money, the economy, children's education, social change and so on. The change in lifestyle associated with the changes in farming method and entry into the modern cash-based consumer society is causing confusion and psychological problems among the Pgaz K'Nyau, many of whom find the changes beyond their ability to comprehend and adapt to.

#### IV. Conclusions

*Respect for all human rights, including indigenous peoples' rights, is a precondition for the protection and sustainable use of the world's forests.*[100]

Not only are the Pgaz K'Nyau not unique in their predicament, what is occurring in the hills of northern Thailand is occurring to a greater or lesser extent in many forested areas of the world. Forests are hotly contested areas of resources meaning different things to different people. It is estimated that 300 million indigenous people live in tropical forests, and that no large areas of tropical forests are uninhabited or unclaimed by indigenous peoples. Tropical forests are therefore areas of abundant ethno-cultural diversity as well as of biodiversity.[101]

Sustainable management of forest resources which is inclusive of all those who have a claim on them will therefore require fair decision-making based on a wide participation from all sectors of society. International declarations, national constitutions and statements by national ministers may emphasise respect for other cultures and the commitment to participatory decision-making, but lack of respect for human rights and democratic processes in the rush to extract timber, or to place forests under national control in order to develop forest resources or to maintain the viability of rapidly shrinking forests often results in the abandoning of these elements along the way. One conclusion of this work is that for truly sustainable management of forest resources, which would avoid many of the unfortunate final policy results described above, these elements need to be taken up again seriously and time-scales lengthened in order to ensure that all parties involved can be satisfied with the final result.[102]

The continuing policy of designating rotational fallow areas as protected forest, effectively forcing ethnic group villagers to shift to production on permanent fields, can only be seen as misguided in the context of the first decade of the 21<sup>st</sup> century. It is now abundantly clear that the world is heading for a crisis of commercial energy (fossil resources) and modern agricultural methods of food production in coming decades. Current food production using modern chemical and mechanized methods are extremely energy intensive; approximately ten units of commercial energy are used to produce each energy unit of food. Since July 2004 energy prices have been rising, the price of oil reaching US\$70 a barrel for a short time at the end of August 2005 and again in April 2006. This is thought to be a phenomenon brought about by the approach of the peak of world production of oil ("peak oil") sometime between 2006 and 2010.[103] Following the peak, energy prices will continue to rise, resource shortages and disruptions are likely to occur because of failing oil and gas fields or resource wars. A shift to less energy-intensive food production systems is necessary, but it will take time. To avoid possible food crises in the mid-term future, governments should be considering ways of making their agriculture less dependent on commercial energy.

The Thai Ministry of Agriculture and Cooperatives cannot possibly be unaware of this problem. The rising price of gasoline (especially diesel fuel) and chemical fertilizers, whose manufacture is very dependent upon cheap supplies of oil and natural gas, has resulted in economic hardship for farmers in Thailand, as it is in all parts of the world. For example, the Ministry is helping to promote the *Saboo Dam* tree (*Jatropha curcas* Linn, English name "physic nut") the fruit of which

can be pressed for oil which can then be used directly in diesel engines with no further processing. Requiring ethnic groups in the hills of northern Thailand to struggle under conditions of economic hardship, without appropriate guidance concerning the energy-intensity of modern farming and the alternatives that might be available to the villagers is tantamount to a policy of impoverishment on top of the unfortunate policy consequences of the past half century. At present, there does not appear to be any movement in this direction on the part of the Thai government, although it does in general appear to be quite favourable towards organic and other sustainable agriculture developments inside the country.

One possible answer to the problems associated with use of former swiddens as permanent fields is a system of alley-cropping developed by Mike Hands in Honduras and Costa Rica. The system uses rows of *Inga edulis* trees planted on the former swidden areas. The leaves of the trees fall to the ground and produce a "deep, durable mulch" simulating the protected physical conditions which prevail on the forest floor. "In encouraging and protecting the development of diffuse, shallow-rooting systems, these conditions provide for efficient retrieval and recycling of key nutrients in exactly the same way as in the forest itself... [and] achieve the virtually complete suppression of weeds within the system.[104] Crucial to this system is the ability of the *Inga edulis* tree to recycle phosphorus, the lack of which is often responsible for the infertility of tropical forest swidden soils. The *Inga edulis* tree has thick, tough leaves, fast growth, the ability to fix nitrogen in the soil, and is intensely mycorrhizal, symbiotically using fungi to absorb phosphorus into its roots. [105] The trees take 2-5 years to 'capture' a site after planting, but thereafter will make it possible to use the field to produce crops each year. Unfortunately, the *Inga edulis* tree is not native to southeast Asia so it will be necessary to find an equivalent native tree and to carry out experiments in the hills before this system can be adapted to northern Thailand, but it will not be found until someone makes a conscious effort to find it.

In the meantime, daily life in the Pgaz K'Nyau villages goes on as normal. Things look peaceful, but under the surface there are biting anxieties about the future; anxieties about cash income, the security of land rights, the future of the community, the future of the language and culture. These anxieties are shared with thousands of indigenous ethnic groups around the world. Just as loss of biodiversity will make our planet less inhabitable, loss of ethno-cultural diversity will make all of our lives drab and featureless in ways that the commercial entertainment industry can never gloss over. The loss, one by one, of these treasure chests of cultural riches represents an incremental loss to the totality of the human spirit. As we approach the twilight of the fossil resource era we will all need to grapple with the issue of how we should be living with the planet.

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- [1] Renard, Ronald D., p.2-3.
- [2] E.g. United Nations Department of Economic and Social Affairs, Population Division and <http://www.census.gov/ipc/www/clock2.html>
- [3] United Nations Department of Economic and Social Affairs, Population Division.
- [4] For example, *The Times*, 24 Aug 2005: <http://www.timesonline.co.uk/article/0,,3-1748423,00.html>
- [5] Smil, V. (1997) and Smil, V. (2001), p.156.
- [6] Renard, Ronald D., p.1-2; Laungaramsri, Pinkaew (2003) pp. 23, 27, 40 (notes 2 and 3). The *r* to *y* pronunciation shift occurred between Early Burmese and Modern Burmese. A major difference in the Thai and Lao languages (and the Thai dialects of northern and north-eastern Thailand are Lao-like) is the *absence* of the "*r*" sound where it occurs in central (standard) Thai. Thus "*riang*" easily reduces to "*yang*" in these areas. *Tai* is an ethnic designation, including the Shan (i.e. *Siam*) people, whereas *Thai* refers to anything pertaining to the country (state) of Thailand.
- [7] Technical Service Club, p.45.
- [8] Keyes, Charles F., p.217, note 3; Laungaramsri, Pinkaew (2001) p.33, [http://www.ethnologue.com/show\\_family.asp?subid=90272](http://www.ethnologue.com/show_family.asp?subid=90272)

- [9] v, j, x, f, z at the end of words are tone markers. "g" is pronounced as a fricative French "r", "c" is pronounced as an English "j". (The orthography used here is a semi-official Romanised script. Many Pgaz Cgauz in Myanmar and Thailand use a script based on the Burmese language script. The difference between the initial "s" or "c" reflects a dialectical pronunciation difference between Pgaz Cgauz who inhabit different regions. A Romanised Pgaz K'Nyau-Thai-French-English dictionary is due to be published in 2007.)
- [10] Technical Service Club, p.5, Delang, p.x.
- [11] Renard, Ronald D., p.8.
- [12] Renard, Ronald D., p.6-7.
- [13] Laungaramsri (2004).
- [14] History of Lanna (Chiang Mai), [http://www.chiangmai1.com/chiang\\_mai/history.shtml](http://www.chiangmai1.com/chiang_mai/history.shtml) and Wyatt, David, K.
- [15] E.g. Lintner, Bertil.
- [16] Kunstadter, Peter, p.83-84.
- [17] Buhpau. *Rai Mun Wian* is a Thai language term coined by activists in the 1990s to explain the swiddening system of the Pgaz K'Nyau (and Phloun and Lua) and oppose the implications behind the forest authorities' term *rai luan loy*. See Laungaramsri, Pinkaew (2001) p.189.
- [18] Kunstadter, Peter, p.9.
- [19] Laungaramsri (2004).
- [20] Tapp, p.49.
- [21] Hasegawa, Matsuo.
- [22] Buergin, Reiner, p.62, note 7.
- [23] Kunstadter, Peter, pp.54, 61.
- [24] Buergin, Reiner, p.51, p.62, note 3; McKinnon, John, p.73.
- [25] Tokyo Shinbun, Sunday Supplement 20-4-2003 (in Japanese).
- [26] E.g. Bass, p.21.
- [27] Bass, p.iii.
- [28] Tapp, p.36, Delang, p.157.
- [29] Tapp, p.39.
- [30] Tapp, p.33.
- [31] Buergin, Reiner, p.43. Hosokawa reports that the Phloun living in the villages inside the Huai Kha Khaeng and Thung Yai Naresuan Wildlife Sanctuaries use the self-designation "Suu".
- [32] *ibid*, p.57-58.
- [33] Laungaramsri, Pinkaew (2001), p.207.
- [34] Buergin, Reiner, p.51.
- [35] See a definition and explanation of good governance at:  
<http://encyclopedia.thefreedictionary.com/Good+governance>
- [36] 1997 Constitution, English version at: [http://www.krisdika.go.th/html/fslaw\\_e.htm](http://www.krisdika.go.th/html/fslaw_e.htm).

#### **Section 46**

Persons so assembling as to be a traditional community shall have the right to conserve or restore their customs, local knowledge, arts or good culture of their community and of the nation and participate in the management, maintenance, preservation and exploitation of natural resources and the environment in a balanced fashion and persistently as provided by law.

#### **Section 59**

A person shall have the right to receive information, explanation and reason from a State agency, State enterprise or local government organisation before permission is given for the operation of any project or activity which may affect the quality of the environment, health and sanitary conditions, the quality of life or any other material interest concerning him or her or a local community and shall have the right to express his or her opinions on such matters in accordance with the public hearing procedure, as provided by law.

#### **Section 78**

The State shall decentralise powers to localities for the purpose of independence and self-determination of local affairs, develop local economics, public utilities and facilities systems and information infrastructure in the locality thoroughly and equally throughout the country as well as develop into a large-sized local government organisation a province ready for such purpose, having regard to the will of the people in that province.

- [37] Laungaramsri, Pinkaew (2001), p.96-97.
- [38] McCoy, p.68; Tapp, p.36.
- [39] McCoy, p.67.
- [40] McCoy, p.68; Laungaramsri, Pinkaew (2001), p.134; Hayami (2004), p.249; Tapp, 20-21.
- [41] McCoy, p.137; Tapp, p.20.
- [42] Tapp, p.20-21.
- [43] McCoy, p.145.
- [44] Santasombat, p.17.
- [45] Kunstadter, Peter, p.8.
- [46] Kunstadter, Peter, pp.9, 38-39; Tapp, p.14; Santasombat, p.17.
- [47] Tapp, pp.47-48; Santasombat, pp.39, 131-132.
- [48] Laungaramsri, Pinkaew (2001), p.178; Santasombat, p.133.
- [49] Santasombat, p.37-38.
- [50] Tapp, p.30; Hayami (2004), p.249; Laungaramsri, Pinkaew (2001), p.135; Laungaramsri (2004).
- [51] Laungaramsri, Pinkaew (2001), p.135. 1 ngan = 400m<sup>2</sup>, 1 rai = 1600m<sup>2</sup>
- [52] Hayami (2004), p.74.
- [53] Tapp, p.24.
- [54] Laungaramsri, Pinkaew (2003), p.41, note 5.
- [55] Buergin, Reiner, pp.50-51, 62 note 3.
- [56] Hayami (1997), p.564; McKinnon, John, p.73.
- [57] Laungaramsri, Pinkaew (2001), p.85.
- [58] McKinnon, John, p.73.
- [59] Puginier, Oliver, p.197.
- [60] Ibid., pp.197, 199, 200.
- [61] Kunstadter, Peter, pp.9, 173.
- [62] Hayami, 1997, p.560; Bass, p.14.
- [63] FAO Documentation, Forestry Institutions, Policies and Legislation,  
[http://www.fao.org/documents/show\\_cdr.asp?url\\_file=/DOCREP/003/X2649E/X2649E08.htm](http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/003/X2649E/X2649E08.htm)
- [64] Hayami (1997), p.560; Kunstadter, Peter, pp.47-49.
- [65] Puginier, Oliver, p.200.
- [66] Kunstadter, Peter, p.52.
- [67] Bass, p.14.
- [68] Maneekul.
- [69] Maneekul and World Rainforest Movement, WRM Bulletin No 57, April 2002.
- [70] Ganjanapan (2004), pp.157-158, 278.
- [71] Kunstadter, Peter, pp.170, 174.
- [72] Ganjanapan (2004), p.278.
- [73] Tapp, p.49,50.
- [74] Kunstadter, Peter, p.62.
- [75] Hasegawa, pp.36-37, 83, 132; Laungaramsri, Pinkaew (2001), p.214, note 8.
- [76] Falvey, p.122; Laungaramsri, Pinkaew (2001), p.206.
- [77] Laungaramsri, Pinkaew (2001), pp.206, 216 note 26.
- [78] Ibid., pp.206, 216 note 27.
- [79] Ganjanapan (2004), pp.274-275.
- [80] Laungaramsri, Pinkaew (2001), p.208; Ganjanapan (2004), p.275.
- [81] Laungaramsri, Pinkaew (2001), p.209.
- [82] Ganjanapan (2004), pp.240, 275.
- [83] Laungaramsri, Pinkaew (2001), pp.183-184. For problems Americans have had with their own forests and National Parks, please refer to Chase, 1987 and 2001, and Pritchard.
- [84] Ibid., p. 184.
- [85] Ibid., pp.185-186.
- [86] Ganjanapan (2000), pp. 86-88, 112-113, 125.
- [87] Laungaramsri (2004).
- [88] e.g. Kimbrell.
- [89] Unless stated, sources for this section are Laungaramsri (2004, pp. 378-413) or from personal field notes.

- [90] Ganjanapan (2004), p.199.  
 [91] Laungaramsri (2004); Tapp, p.48.  
 [92] Ganjanapan (2004), p.200.  
 [93] Ibid., p.259.  
 [94] Laungaramsri, Pinkaew (2001), pp.232-236, Santasombat, pp.62, 73, 76.  
 [95] Laungaramsri (2004); Ganjanapan (2004), p.203.  
 [96] Ganjanapan (2004), p.224.  
 [97] Ibid., p.221.  
 [98] Ganjanapan (2000), especially Chapter 4, *Titling and Local Control of Land Tenure*.  
 [99] <http://www.psyweb.com/Drughtm/valium.html>  
[http://www.sixthseal.com/2005/04/chlordiazepoxide\\_librium\\_the\\_f.html](http://www.sixthseal.com/2005/04/chlordiazepoxide_librium_the_f.html)  
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 [102] E.g. Magin, p.5.  
 [103] E.g. ASPO at [www.peakoil.net](http://www.peakoil.net)  
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 [105] Elkan, Daniel, p.61.

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[Photo 1]

