

## INTRODUCTION



Eucalyptus began to be widely planted in the northeastern Thailand in the late 1970s by the government in line with reforestation policy because the forest cover in Thailand had dramatically decreased since the 1960s. Forest cover in the country accounted for only 26% of total land in 1993 despite its having occupied more than 50% in the early 1960s (Forestry Statistics of Thailand 1995). This severe deforestation is regarded as one of the by-products of the rapid economic growth after the Marchal Sarit Thanarat administration (1957 - 1963).\*

Reforestation was led by the government until the 1980s when the policy was changed to urge the private sector to implement reforestation activities owing to the too costly investments needed. The government found it difficult to cope with the activities alone. The governmental and private sector eucalyptus plantations started to draw people's attention, and since then, eucalyptus planting is a controversial issue in the Thai society. In fact, eucalyptus plantations in Thailand have a unique history. They were first introduced into and promoted in Thailand by the government and private

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\* Relatively high and stable economic growth was achieved in Thailand under seven Five-Year National Economic and Social Development Plans (Warin and Ikemoto, 1988). Especially in the late 1980s, Thailand attained a high economic growth of more than 10% a year (Praphan and Hayashi, 1995)

enterprises. However, the local farmers are now taking the initiative in eucalyptus plantations even though they protested against them in the 1980s.

In 1985, the government decided to leave 40% of its total land-holdings as forest cover (15% preserved forests and 25% economic forests). To establish economic forests, the government promoted eucalyptus by propagating it as a fast-growing and economical plant. As a result, big enterprises started to introduce eucalyptus planting activities and received several privileges. For instance, they were offered "devastated forest land" in the national forests for their eucalyptus plantations from the government at a relatively reasonable price.

Consequently, farmers (seen as "squatters") who resided in the "devastated forest land" were forced to move out. As a result, they started an anti-eucalyptus movement. Since the sites of the eucalyptus plantations were mostly in the northeast of Thailand, anti-eucalyptus movements in the region were the most serious. Such movements reached their peak in the late 1980s, and they were strong enough to draw the attention of the public.

That was when the government began reconsidering its policy on reforestation and eucalyptus plantations. It stopped expelling people from the land and started to encourage and support local farmers to plant eucalyptus on their land. Consequently, no anti-eucalyptus movements have been raised since 1992. Moreover, eucalyptus plantations in farmlands have been enlarged.

Presently, eucalyptus planting areas in the northeast are estimated at 1.1 million rai\* (0.176 million hectares). Half of the land has been planted during the past five years (Nagata 1996). However, since public statistics usually do not include information on private plantations, the actual total area of plantations may be considerably larger. Based on its own research, the Reforestation and Extention project in the Northeast Thailand (REX)\*\* estimates eucalyptus planting areas on farmlands in the northeast at 1.8 million rai (0.29 million hectares). Such huge areas lead to the pre-conception that farmers have taken the leading role in current eucalyptus planting.

This thesis is an attempt to investigate the underlying reasons concerning eucalyptus plantations and implementation project in the northeastern part of Thailand from 1992 to the present. Subjects included are the introduction of eucalyptus as a highly promising economic plant to the Thai society and its agricultural circle, the eucalyptus market, and the problems which come with the promotion of eucalyptus plantations.

The first chapter explains the historical background regarding the introduction of eucalyptus plantations in Thailand. Principal factors which motivated the government to import and promote eucalyptus

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\* A "Rai" is a land measurement used in Thailand. 1 rai = 0.16 hectare

\*\* This is the reforestation project by the Royal Forest Department under the support of JICA (Japan International Cooperation Agency) which is an agency of Japanese Official Development Assistance.

plantations are specifically discussed. Chapter two describes the nature of eucalyptus as a fast-growing plant as respects two important aspects - ecology and economy. The third chapter deals mainly with strategies and implementation led by the Thai government, Japan International Cooperation Agency(JICA) and Japanese companies. The role of JICA in supporting eucalyptus planting projects, both in financially and technically will be discussed and analyzed. The way in which the Thai government, with the support of JICA, encourages the northeastern farmers to adopt the eucalyptus plantation projects will be elaborated. Changes in the rural society after eucalyptus has been introduced and implemented will be discussed in the fourth chapter. Comparative aspects regarding the life style of farmers before and after eucalyptus are incorporated as well as the factors which motivated farmers to adopt eucalyptus as a new cash crop. The final chapter deals with the long-run and short-run benefits, and the problems which are taking place at present or may occur in the near future. Hopefully, this thesis will lead to further discussions and research about rural development in Thailand.

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## CHAPTER 1

### INTRODUCTION OF EUCALYPTUS PLANTATIONS IN THAILAND

Eucalyptus was first introduced into Thailand in 1946. In the early 1970s, it was found that *Eucalyptus camaldulensis* was the only variety among 600 species of eucalyptus imported from Australia that had the ability to grow successfully in Thailand. However, a large-scale plantation was not established until 1978. Even though eucalyptus had been recognized as a new alternative raw material for pulp and paper industries, eucalyptus seedlings were too expensive at that time to import and widely plant (Apichai et al 1992). Since cheap seeds were found and introduced from Australia, planting areas have been expanded extensively. At least three related factors have contributed to this rapid eucalyptus boom.

#### 1.1. Deforestation

The first factor is the serious deforestation in Thailand which has caused the government to implemented reforestation which encouraged the private sector to plant eucalyptus. As it is widely known, the deforestation has been quite serious in Thailand since the 1960s. According to a Bangkok Post report (December. 31, 1987), the country's total forest area was 187 million rais (or 299,200 square kilometres) in 1950. In other words, 58.3% of the total land area<sup>\*</sup> was forest.

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\* The total land area of Thailand is 320.7 million rais (or 513,155 square kilometres).

However, it had been decreased to 171 million rai (273,629 square kilometres) or 53.3% by 1961. This means 1.45 million rai (2,320 square kilometres) of forest area had been destroyed for each year since 1961. It diminished further to 93.2 million rai (149,053 square kilometres), or 29.05% of the country by 1985. In short, 3.2 million rai of forests have disappeared annually. Forest area became 26% in 1993 (Forestry Statistics of Thailand 1995).

Such destruction of forests brought changes in the local ecosystem, and has had far-reaching consequences, such as increased flash floods\* and droughts, soil erosion, and silt in ports and at the mouths of rivers (Tasaka 1991).

This kind of deforestation is significantly seen in the northeastern region of Thailand. The data (Figure 1) shows that 42% of the whole area was forest in 1961; however, it had been decreased to 29% by 1985. This was due to the expansion of farmlands which was related to the problem of population increase (Theodore et al 1990). The situation was often explained in this way: since the soil in the northeastern region was not fertile enough to cultivate effectively, farmers had to expand their farmland to increase productivity. To do this, farmers had to cut down forests. However, this was not the only reason underlying the decrease of forest area. Many rich forests were burned down during the conflicts between the army and communist

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\* A catastrophe resulted from a sudden flood and mudslide, causing severe destruction of life and property in the South towards the end of 1988. This is one occurrence that galvanised the authorities into action (Bangkok Post 1990).

guerrilla movements. Moreover, some forests were cut down by the logging industry. For whatever reasons, the trees had been lost, the forests never recovered because the land had been transformed to farmlands after the destruction.

Significant deforestation is one of the main factors which has caused eucalyptus to boom in the northeastern region of Thailand. Because eucalyptus has become one of the principal species promoted by the government in their reforestation strategy.

## 1.2. Pulp Shortage

The next factor related to the eucalyptus boom is the chronic shortage of raw materials for pulp and paper industries.

Basically, paper is produced from pulp which is generally divided into two categories: long fiber-pulp and short fiber-pulp. The former is made of the soft wood of the pinus family, while the latter is made of hard wood and other materials such as rice straw, bagasse, and bamboo. Pulp which is produced from eucalyptus is short fiber-pulp (Masaki 1993, Nation, Feb. 22, 1989).

Because of its geographical location, Thailand has a limited supply of pinus wood, and long fiber-pulp production is infeasible. As a result, all pulp mills in Thailand are producing short fiber-pulp. Long fiber-pulp is mostly imported (Masaki 1993, Nation, Feb. 22, 1989).

Since the first pulp mill in Thailand, Kanchanaburi Paper, was

established as a state enterprise in 1945, the raw materials used non-wood, such as bamboo and imported bagasse (Suchada 1977, ASRCT 1973). Even though the production capacity of the mill was 9,000 tons a year, this was not adequate to meet the country's demand. As a result, large amounts of pulp had to be imported at that time (Masaki 1993, Tasaka 1991, Nation, Feb. 22, 1989).

After six paper factories\* were established by 1972 by local investors, most of the pulp used for paper production was imported because the supply of non-wood materials was limited and therefore could not serve as a reliable source of raw materials for the paper industry. For instance, rice straw is the by-product of rice cultivation and bagasse is the by-product of sugar cane. Their yearly production depends completely on the volume produced. The supply of these materials depends mainly on weather conditions and the market price farmers can obtain per year (Tasaka 1991, Bangkok Post 1981). Furthermore, the pulp industry must compete with other industries for the limited amount of bagasse, because it is a versatile raw material, with many applications.\*\* A Thailand Development Research Institute (TDRI) study states that the same situation can be found in the supply of two other indigenous raw materials - jute and bamboo

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\* Bang Pa-in Paper Mill (1962), Bangkok Paper Mill (1964), Siam Paper Co. Ltd. (1967), Siam Kraft Paper (1969), The Thai Union Paper Mill (1972), Thailand Newsprint Co. Ltd. (1972)

\*\* Tasaka says that pulp industry has to compete with the animal food industry since bagasse is used in animal food (Tasaka 1992). Moreover, bagasse is widely used by sugar mills as a source of energy for their machine (Bangkok Post, 1981).



(TDRI 1989)\*.

Thus, the factories have been dependent on imported pulp. According to the Bangkok Post (1981), Thailand's major pulp suppliers were the U.S.A., Canada, Finland and the USSR. These countries had been supplying roughly 70% of the country's demand. However, the 1973/74 oil price shock in the world economy caused the price of pulp in the world market to increase rapidly. Following this increase, prices in the domestic market were increased. Therefore, increased local pulp production was encouraged to avoid dependence on imported pulp (Apichai et al, 1992). According to Apichai, Somboon and Chaiyuth (1992)\*\* , production capacity was increased from 39,000 tons per year in 1977\*\*\* to 104,500 tons in 1982.\*\*\*\* In early 1982, some firms started to produce pulp for local market supply. However, the pulp industry had to depend on non-wood raw materials at that time, and there were signs of raw materials shortages because of the increasing

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\* The Nation says that the number of bamboo trees dwindled due to over-exploitation (The Nation, Feb. 22,1989)

\*\* Currently be in Faculty of Economics, Thammasat University. Authors of "Political Economy of Eucalyptus: Business, Bureaucracy and the Thai Government" in Journal of Contemporary Asia, Vol.22 NO.2 (1992)

\*\*\* They said pulp production statistics were not available until 1982 (Apichai et al 1992).

\*\*\*\* According to The Nation (Feb. 22, 1989), commercial pulp production was quite stable between 1977 and 1981 because the number of pulp factories was not increased. It is because building a pulp factory is expensive and planning and construction takes a few years.

of demand. The Nation (1989) reported that *"many paper producers added pulp to their production lines; pulp produced for the paper factory's own consumption rather than for sale"*.<sup>1</sup>

Thus, the Thai pulp industry needed to depend more on the wood-material of fast-growing trees as the main production input (The Nation, Feb. 22, 1989). That is why eucalyptus was chosen to be one of the inputs.

### 1.3. Thai Governmental Policies

The last factor related to eucalyptus boom is more direct and also the largest.

#### 1.3.1. Reforestation Policy

As pointed out in 1.1., deforestation in Thailand during the past three decades had been significant. Therefore, the government tried to improve the forests conditions. As a result, various efforts for reforestation had been included in the Fifth and Sixth Five-Year National Economic and Social Development Plans. In the Fifth Plan, covering 1982 - 1986, the Royal Forest Department (RFD) was required to plant trees at a rate of 300,000 rais (480 square kilometres) annually.

In the Sixth Plan, covering 1987 - 1991, the government announced the long-term target for increasing forest areas as 40% of the country's total land area. This 40% forest area is divided into 15% conserved forests and 25% economic forests. Conserved forests are areas to be

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1. The Nation, Feb. 22, 1989.

maintained for ecological balance, including watershed areas, national parks and wildlife sanctuaries. Meanwhile, economic forests are forests which will be exploited for economic purpose. Consequently, the government encouraged state and private enterprises to plant fast-growing trees to supply their factories in economic forests. Thus, people began to plant eucalyptus widely as a suitable species for replanting denuded forests and as a way to generate income for the investors and rural villagers. For instance, the "Green Isan" project was an attempt led by former Chief Army Commander and Supreme Commander General Chavalit Yongchaiyudh to turn the northeastern region into green pasture to help raise people's standard of living. At the same time, the project was to encourage state and private enterprises to expand their plantations. Some 400,000 rais (640 square kilometres) of eucalyptus plantations were planned, and were tied to the additional plan of establishing newsprint and paper-pulp factories in the region (Tasaka 1991, Bangkok Post 1987).

### 1.3.2. Industrialization Policy

The government had another reason to encourage the private sector to implement eucalyptus plantations. Apart from reforestation, they aimed to support the pulp and paper industries to promote industrialization in Thailand. Since the 1960s, pulp and paper industries had received several privileges including the support of eucalyptus plantations. After September, 1957, the Pibun Songkhram regime which supported economic nationalism, was overthrown and replaced by Sarit Tanarat's American-supported government. The new regime propagated private business and foreign investment as a strong economic instrument to fight against communist movements in Thailand.

Paper and pulp industries attracted investors and attained relatively rapid growth (Apichai et al, 1992). However, when the Thai pulp industry emerged in 1982, the price of pulp in the world market began to decline. According to The Nation (1989), *"this troublesome period was not supportive to Thailand's nascent pulp industry. Unless protected, cheap pulp from abroad could easily undercut the local production"*.<sup>2</sup> The government, as a result, had to give privileges to the industry.

These privileges included duty exemptions on imported machinery and raw materials, various tax holidays and tax exemptions for extended periods, and incentives for eucalyptus plantations. Eucalyptus was promoted for planting in the so-called "devastated forests" or, in other words, national reserved forests.\* Moreover, planters were able to receive leases of reserved forest land for 10 baht per rai annually.\*\* However, the rental rate for reserved forest land on the market was 150 to 200 baht per rai per year which was extraordinarily low.\*\*\* Thus, these incentives provided eucalyptus plantations with

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2. The Nation, Feb. 22, 1989

\* The so-called "Devastated forests" are not areas without trees. Also, in most cases, so-called "squatters" had lived on these land for generations. As a result, incoming planters caused the "squatters" to begin anti-eucalyptus movements.

\*\* This concession was revoked in May, 1990, as results of crucial anti-eucalyptus movements and criticism against corruptions related to the concessions.

\*\*\* According to Apichai, Somboon and Chaiyuth, some high-ranking government officials argued that the rate had already been increased

advantages which other agricultural crop industries did not receive (Apichai et al 1992). Consequently, a number of companies took an interest in eucalyptus plantations. Even enterprises which were not paper and pulp connected applied for the privileges by starting eucalyptus plantations as one of their activities.\*

As a result of these incentives, leading pulp and paper companies drew up a blue prints for huge eucalyptus plantations. For instance, Phoenix Pulp and Paper Co. Ltd.\*\* , a leading company,

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10% from the original 1 baht per rai per year. The rate was raised to 10 baht after protests against eucalyptus plantations had surfaced (Apichai et al 1992).

\* These low-rate leases caused problems, too. Apichai, Somboon and Chaiyuth said; *"the fact that the lease is so cheap and that the leasing period is so long, means that the planters can make a lot of use of land which is now becoming a very scarce resource in Thailand. There can be various forms of alternation of use of land that will generate more earnings than growing eucalyptus by means of some "special" cooperation by government officials. Examples of such activities are converting parts of the area into tourist resort, country clubs or golf courses"*. Additionally, the eucalyptus planters made substantial income from clear cutting the remaining woods which were left in the reserved forests under concession (Apichai et al 1992).

\*\* Phoenix Pulp and Paper Co.Ltd, a Thai-Indian joint venture, has a pulp mill in Khon Kaen. They had depended on kenaf planted mainly in the northeast mainly. However, since kenaf production decreased year by year, they switched their raw materials to eucalyptus and bamboo

formulated a plan to plant eucalyptus trees and bamboo in an area of about 100,000 rai (16 square kilometres) in Khon Kaen province<sup>\*</sup>, with a budget of approximately 250 million baht. Siam Pulp and Paper Co.Ltd.<sup>\*\*</sup> also planned to cultivate eucalyptus over an area of 30,000 rai (48 square kilometres) to increase the supply of raw materials for pulp manufacturing so that it would be able to meet the demand of its affiliated paper mills. What is more, Suan Kitti Pulp and Paper Co.Ltd., a joint venture of Japan and Taiwan, implemented a huge and fully integrated pulp and paper project, planting eucalyptus trees on 300,000 rai (480 square kilometres) (Tasaka 1992, Bangkok Bank Monthly Review 1989).

While these huge enterprises planted eucalyptus to produce pulp, smaller scale planters were planting eucalyptus to produce chipwood for export.

The reason why many companies were not willing to come in producing pulp was because it was hard to get a share in the domestic market. For instance, Suan Kitty pulp and Paper co. Ltd. made a short statement explaining the tough competition in the pulp market ; *The*

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(Tasaka 1992).

\* Nam Pong, Khao Suan Kwang and Ubonrat Districts.

\*\* Siam Pulp and Paper, sited factories in Ratchaburi and Kanchanaburi and had produced pulp from bagasse. However, as mentioned earlier, the supply of bagasse was insufficient. Additionally, the transportation costs of bagasse to the mill were a lot higher than that of other materials such as rice straw, bamboo or eucalyptus. (Tasaka 1992, Bangkok Post 1990).

company plan to produce 330,000 tons of pulp, the largest mill with much higher production capacity than all existing mills combined. It is expected that by 1992 when the mill of Suankitti is in actual operation, the production capacity of pulp mill will be much higher than that of domestic needs. It will not be until 1996 that the domestic demand will catch up with the production capacity (Matichon, May 7 1990). This is why other companies are only concentrating on the production of chip-wood for export for the time being.<sup>3</sup> Apart from this, there were other reasons such as reducing the risk of being involved directly in the Thai pulp industry from the beginning, when it was still young and unstable, even though it grew relatively quickly. Furthermore, not only pulp but chipwood was in high demand. In 1995, Somyos(1995)<sup>\*</sup> described the demand for eucalyptus wood for chipwood supply, and the demand outstripped the supply by about 60%. It serves as raw material to many industries, not only pulp, but also fiberboard and cementboard. The demand for this eucalyptus chipwood is very high, particularly in Japan and Taiwan (Tasaka 1992, Bangkok Post 1987). As a result, most of the eucalyptus chipwood is exported to the pulp industry in Japan and Taiwan. For instance, Figure 3 shows that almost 70% of pulp in Thailand is exported to Japan.

The government also encouraged chipwood export which is obvious from their promotion of huge eucalyptus plantations in Laem Chabang, a new deep sea-port of Thailand. TDRI, a governmental research institute which influences the government's policy-making, suggested locating

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3. Apichai et al. 1992. pp.191

\* Director of ASEAN Forest Tree Seed Center, Muak-Lek, Saraburi in Thailand and author of "Eucalyptus Cloning in ASEAN"

eucalyptus plantations within a 250-kilometer radius of Laem Chabang. They pointed out that from an economic point of view, the provinces around Laem Chabang were desirable places for eucalyptus plantations. According to their studies, the transportation costs to the port would be considerably higher if the plantations are 250 kilometres away (TDRI No.5 1989). Actually, as suggested by Apichai, Somboon and Chaiyuth (1992), there was a strong concentration of eucalyptus plantations in Cha-choengsao, even though the land was not appropriate for eucalyptus because the fertile soil could have been better used to grow other crops.

Thus, eucalyptus plantations brought a kind of boom, and the planting area had increased considerably since the 1980s. However, this rapid expansion caused serious problems within the Thai society. Although their negative impact on the environment is often discussed as a concern, the most serious problem was the land-ownership issue.

As mentioned in the earlier part of this chapter, eucalyptus plantations have been promoted in the so-called "devastated forests". Interestingly, there exists no concrete legal definition of what "devastated forest" means. These "devastated forests" have often been occupied by farmers, even though they might not have been legal land title holders.\* Therefore, when RFD gave concessions to eucalyptus

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\* Those people are generally called "squatters". However, as Apichai, Somboon and Chaiyuth (1992) mention, some arguments were raised against that designation. They said that the term "squatters" is usually for people who settle down on land without having a legal title and that it could be misleading because the Reserved Forest Act was passed in 1964,



planters, former occupants were evicted from the land. Even when eucalyptus concessionaries bought land from the farmers, the compensation was at a much lower rate than that of the market price. In addition, the planters and concessionaries were given a "guarantee" of the perception of leases. The anti-eucalyptus movement developed under such conditions.

In Thailand, there had been a number of anti-eucalyptus cases in several provinces up to 1992. Many cases were critical enough that farmers burned eucalyptus seedlings, RFD offices, and called for demonstrations (Masaki 1991). Thus, actual movements were caused by people's land tenure rights more than their ecological perceptions. Despite this, the adverse affects of eucalyptus on the environment has

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and during that time, more than 80% of land in Thailand was without titles. However, this did not mean that the land had not been occupied. In 1988, some time after the "squatter" issue had become serious, the government announced provisions for proper land titles for those people who had already settled on their lands. They divided the occupants into three groups: (1) communities existing before 1967, (2) communities existing from 1967 to 1975, and (3) communities existing from 1975 to 1981. The first group could receive proper land titles. The second group received the deeds for the right to make use of the land. That right could be passed to the next generation through inheritance but could not be sold to outsiders. The third group was allowed to make use of the land temporarily. There were general expectations that the degree of ownership would be upgraded in time. However, it gave eucalyptus planters the opportunity to eventually have ownership of the leased/purchased land, too.

often been a topic raised by anti-eucalyptus movements.

However, the situation began changing in 1989. Farmers started to take the initiative in eucalyptus planting. It is believed that the introduction of contract eucalyptus planting helped farmers take this initiative.

Contract farming is popular for chicken farming and food processing farming; however, it also seems useful in promoting eucalyptus plantations. Masaki (1991) explains *"contract farming can be adopted that the contracting relationship is a way of coordinating the flows of goods through a vertical chain of production and marketing, and in contract farming, the firm exercises considerable control over raw material production without ownership of the production unit. Farmers do not need to have their own capital and company will identify sources of loans and guarantees. Farmers thereby have no more worries about marketing problems"*.<sup>4</sup>

In short, to secure a certain amount of grown eucalyptus, enterprises offer contracts to farmers to supply them with seedlings, technical support, deposits, setting the minimum price and advanced payments.

In the case of eucalyptus planting, contract farming is a possible way for eucalyptus promoters to expand their plantations to farmers' land without conflict with local people. Since the conflict with local people heavily promotes stroke, one can say that this is a

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4. Masaki 1991, pp.34

promising way of eucalyptus promotion.

In addition to this, it is said that contract farming is a way to decrease the disadvantages of eucalyptus planting for small-scale farmers as well. The northeast has the biggest eucalyptus planting area, however, for the northeastern farmers, most of whom are small farmers, eucalyptus planting does not always mean high profits. A TDRI survey states that it is rather difficult to have high profits for small scale planters from eucalyptus planting: *corporate and large farmers has tendency to receive higher profit than small scale farmers: large scale (over 100 rais) planters and companies make a good profit of 450 - 540 Baht/rai/year, but small scale (less than 100 rais) planters lose of 48 Baht/rai/year (Masaki 1990)*. This is because most of the eucalyptus will be exported, and the transportation costs are very high since the northeastern planters do not have good access to the port. However, once the planters have a contract with a company, they do not have to worry about this. The planters only grow the eucalyptus and the companies deal with other matters. Therefore, the planters prefer to have contracts with companies.

As it will be explained in detail in the fourth chapter, most farmers who grow eucalyptus on their farmland now have contracts with big paper and pulp companies. However, why is eucalyptus so popular for the farmers as their economic crop? The following chapter will explain why the farmers choose eucalyptus as a promising cash crop based on its nature and economical value, as well as the negative impact of both on the environment and the ecosystem.