Materials

From Plantation Forestry to the Pulp and Paper Industry: A Case Study of Vietnam

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Abstract

This study aims to discuss plantation forestry and the pulp and paper industry. The writer applies research methodology using 'political ecology' analysis which emphasizes stakeholders' movement (the role of government, private sector, local community, NGOs, and academics) and their responses from the viewpoint of economic reform, forest policy, forest land distribution and concession, contract farming, and the incentive of economics on plantation forestry and the pulp and paper industry. The research site was carried out to interview several informants and stakeholders from government offices, the private sector, academics, NGOs and households who are active in managing forestry and developing pulp and paper in Hanoi, Phu Tho Province and Phu Ninh District.

Key words: economic incentive, land tenure, Ministry of Agriculture and Rural Development (MARD), plantation forestry, political ecology, pulp and paper industry.

Introduction

Generally, the forestry sector is categorized in the agricultural sector in Vietnam (HIEU 2004: 87). In the reform period from 1989 to 2001, Vietnam had high GDP growth of about 7.1% annually and the role of agriculture in creating employment in rural communities was significant. As shown in Table 1, in this period the growth rate of the agricultural sector remained stable at an average of 3-5%, while the growth rate in the industry sector was higher, at about 8-14%. From this stable and high growth in both sectors, the economic structure of Vietnam gradually shifted into

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Table 1. Annual growth rates of industrial and agricultural sector GDP and rural population share in Vietnam 1990-2001.

Year	Industrial growth(%)	Agricultural growth(%)	Population(%)
1990	2.27	1.00	80.5
1991	7.71	2.18	80.5
1992	12.79	6.88	80.1
1993	12.62	3.28	80.0
1994	13.39	3.37	78.9
1995	13.60	4.80	80.0
1996	14.46	4.40	78.9
1997	12.62	4.33	77.3
1998	8.33	3.53	76.9
1999	7.68	5.23	76.4
2000	10.07	4.64	75.8
2001	10.32	2.79	75.2

Source: General Statistic Organization (2003) and Hieu (2004: 86).

'industrialization', which is addressed via the reduction of the agricultural sector contribution to GDP from 33.1% to 23.6% in 2001 (Hieu 2004: 86).

The main social implication from the reform period was a dramatic reduction in the poverty rate. The expenditure per capita below the poverty line fell from 70% in the mid 1980s to 58% in 1993 and to 37% in 1998. Vietnam is one of the few countries that have succeeded in the twin objectives of increasing the growth rate and reducing poverty. However over 75% of the population lives in rural areas (Table 1), and about three-quarters of the rural labor force work in the agriculture and forestry sector, of which about 25 million people rely on non-timber forest products for their livelihoods.[1] Therefore, the establishment of plantation forestry to supply the pulp and paper industry in the district is very significant for job creation among rural communities. On the other hand, development of the industrial sector has mainly focused on low job-creation fields; hence this plantation forestry sector is strong enough to attract surplus workers from rural areas (Central Institute for Economic Management 1999: 27). As a consequence, the slow movement of workers from rural to urban areas and declining contribution of agriculture to GDP have led to a widening of the income gap between urban and rural workers, and 90% of the poor now live in rural areas (FAO 1999).

In Vietnam, all forests are owned by the state under the management of the Ministry of Agriculture and Rural Development (MARD). The Department of Forestry (DoF), which is under the MARD, has the authority to manage and issue regulations regarding forests. It emphasizes in articles 22, 24 and 26, Decree No. 108/2006ND-CP on 22/9/2006, detailed regulations and guidelines for the implementation of the law on investment. Forest rent is stipulated in Decree number 23/2006/NS-CP, dated

1 See Central Institute for Economic Management (1999) and Hieu (2004: 87).

03/3/2006, and concerns the implementation of the law on protection and forest development in 2004. The DoF is to allocate production forests through timber concessions for three main actors, namely private companies, state enterprises and individuals or households (under cooperatives). The government provides incentives to the private sector in the form of easier procedures for obtaining timber concessions, and easier access to financial institutions and tax holidays for the import of machineries for establishing the pulp industry. According to a government officer, the government also provides subsidies to households and individual farmers for planting trees by proving seedlings and fertilizer, with the aim of actively engaging farmers in planting trees (Interview March 5, 2010). As a result, the programs eventually lead to a boost in economic development and job creation in rural communities.

Generally, land tenure for the private sector is provided for 50 years, with a possibility of extension based on the stakeholder's performance. The size of land private companies could obtain ranges from 5,000-10,000 hectares, for households from 10-30 hectares and for individual farmers 2-5 hectares. The regulation the timber concession sizes, monitoring and penalties are managed by the DoF at the provincial level, because management was decentralized.

According to a MARD report, nearly 8.8 million hectares of forest (50%) have been allocated to various targets, of which 2.61 million hectares (29.7 percent of the area allocated) have been allocated to 450,000 households. An additional 50,000 households have received a total of over 1.86 million hectares of forest on contract for State Forest Enterprises, protection and special-use forest management, as well as foreign companies or joint venture companies (DO DINH SAM and LE QUANG TRUNG 2003: 161).

The paper focuses on plantation forestry and the pulp and paper industry from the viewpoint of *Eucalyptus* plantation development in Vietnam, the response from stakeholders (government, private sector, and local community) on plantations, as well as working with households, individuals and cooperative sectors to provide timber supply. Finally, the discussion reviews timber consumption demand and the development of the pulp and paper industry from the 1980s to the 2000s. This research finding could contribute a valuable lesson among other insular regions of Southeast Asia including Indonesia.

Study Sites and Methodology

This study utilizes 'political ecology' as an analytical framework which emphasizes the stakeholder's movement (the role of government, private sector, local farmers, NGOs and academics). We must clarify, what political ecology means. Many scientists (BLAIKE and BROOKFIELD 1987, BRYANT *et al.* 1993, PETERSON 2000, LYE *et al.* 2003) define it differently. BLAIKE and BROOKFIELD (1987) note that "political ecology is a framework to understand the complex interrelation between local people,

national and global political economies and ecosystem." In this context, political ecology is a framework to approach to the subjects mentioned. It is a generic term used for field research connecting two types of study by bringing the point of view of politics into the study of environmental disruption. It includes a small-scaled study centered on local society (e.g., cultural anthropology, sociology) and a large scaled study from a national to global standpoint (e.g., politics and political economy).

The field work was carried out in March 2010 in Hanoi with two government officers, two officers of Research Institute of Pulp and Paper Industry (RIPPI), two members of Vietnam Pulp and Paper Association, two academics and two NGOs staff. Meanwhile, the field study sites were located in Phu Tho Province, Phu Ninh District (Fig. 1). In-depth interviews were with informants such as two officers of the Department of Forestry in Phu Tho, two Vinapaco officers, two officers of the Research Institute of Vinapaco and six local farmers.

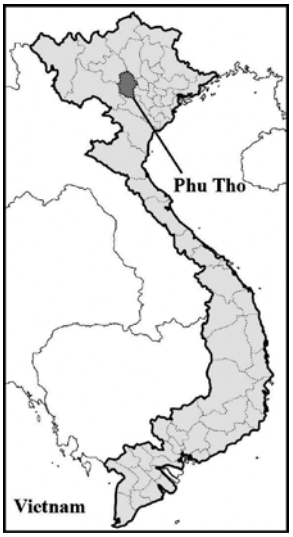

Fig. 1. Vietnam, where field work is located Phu Tho Province.

Phu Tho Province was chosen to carry out field research. Phu Tho Province has an integrated allocation model for the establishment of cooperatives for planting trees and State Forest Enterprises using "contract farming" with farmers and households, such as Vinapaco and Bapaco. According to a Phu Tho Province forestry officer, the annual budget of the government office covers 1 billion VND to manage forests, plant trees and conduct monitoring (Interview, March 5, 2010). The amount of forest registered is 353,261 hectares in Phu Tho Province.[2] The DoF in this province has given 195,000 hectares for timber concessions to households and 144,000 hectares to private companies. In case of the State Forest Enterprises, represented by BAPACO, it has received 60,000 hectares for plantations. The area is divided into 50,000 hectares

2 Forest area in Phu Tho Province is categorized very limited compared with other northeastern provinces such as Cao Bang 672,462 ha and Lang Son 830,348 ha (Department of Forestry 2008).

where BAPACO cooperates with households and has established cooperatives, while the remaining 10,000 hectares is owned by VINAPACO[3] for planting trees.

Under the 661 projects policy, the government is obliged to implement sustainable forest management. The national budget to cover 661 projects is 20 billion VND, with a target of planting 10 million hectares of trees located in production, protected and special use forests. In case of Phu Tho, sustainable forest management is being implemented with the planting of 17,000 hectares of trees in special-use forest and 33,000 in protected forests. The purpose of planting trees in protected forests is aimed at forest conservation, reducing soil erosion and protecting biodiversity. The districts within Phu Tho Province have the responsibility to monitor plantations, while the province levels functions as a general manager.

Results and Discussion

Eucalyptus plantation development

The Vietnamese forestry sector has never in its history witnessed such an active participation of the people at large (farmers, the cooperative sector, private companies, etc.) as during these last 10 years (1990s) in *Eucalyptus* plantations. The driving factors of this are: (1) Vietnam launched a strategy to recover denuded hill areas for planting trees and forest conservation. The effort in tree planting in the northern provinces started in 1975; (2) the government has enabled foreign investors to actively engage in plantation forestry to provide timber for forestry industries and conservation as well. This policy brought about a positive response from foreign companies and NGOs to conduct tree planting and (3) economic reform in Vietnam shifted from centrally planned systems to mechanisms oriented to a market economy (liberal trade). The main target in the forestry sector has been the application of a policy of land and forest allocation for farmers, households, the cooperative sector, and private companies. This scheme leads to encouragement of stakeholders to aim for a better socio-economic life in the future (TRAN 1993).

Since their development in 1985, *Eucalyptus* plantations have been developing nation-wide from north to south under two methods of establishment. The first are concentrated industrial plantations, which have been carried out by private companies and State Forest Enterprises. The second are scattered tree planting practices, which have been conducted by households, farmers, cooperative sector, people's leagues, etc.

The areas planted with *Eucalyptus* have become larger than any planted with other tree species, such as *Manglietia glauca, Pinus* spp, *Styrax tonkinensis, Tectora grandis,* etc. According to a DoF officer, most local tree species are prioritized for planting in protected forests because they absorb much water and it is better for conservation and protection from soil erosion. Meanwhile, *Eucalyptus* trees, as fast growing trees, are planted in production forests to provide timber for the pulp and paper industry (interview

3 VINAPACO is also State Forest Enterprise, whose major task is providing for planting trees for Bai Bang Paper Company.

March 9, 2010).

It seems that *Eucalyptus* plantations have been playing a significant role in providing timber for the pulp and paper industry, with about 77,291 hectares planted over the period 1986-1990. As an illustration, for the period 1986-1990, 303,486 hectares of plantations of all species were established; 50% by State Forest Enterprises and 50% by other entities such as private companies, farmers and households and 165,000 scattered trees (equivalent to 1,020,000 hectares, counted on the basis of 2,000 trees for 1 hectare) planted. According to MARD, it is estimated that over 50-60% of the full plantation area was planted with *Eucalyptus* (300,000-400,000 hectares) and 70-80% of the scattered tree areas were planted with *Eucalyptus* (700,000-800,000 hectares) (TRAN 1993). Data on *Eucalyptus* plantation areas established by state-owned enterprises during the period 1986-1990 are outlined in Table 2.

Table 2. *Eucalyptus* plantation area 1986-1990 (ha).

Species	1986	1987	1988	1989	1990	Total
All tree	99280	64477	63262	35637	40830	303486
Eucalyptus	18084	7058	15045	17104	20000	77291

Source: 30 years (1961-1990) of Forestry Development; the Department of Forestry, 1991.

The above shows that State Forest Enterprises are categorized as the lowest in the planting of *Eucalyptus*, as they are located in mountainous areas in which *Eucalyptus* is not possible. However, the trend is towards more *Eucalyptus* plantings in State Forest Enterprises, such as in the central northern zone, coastal midlands of the north east, coastal hillsides of northern central Vietnam, coastal hillsides of central Vietnam, southeastern Vietnam and southwestern Vietnam.

Main species used

Some 30-40 *Eucalyptus* species have been introduced into Vietnam, but in almost all areas only one species, namely *Eucalyptus camaldulensis,* from Petford District (Australia) has been used for practical plantations. In its development, *E. tereticornis* has also been used for some small plantations in the northern Vietnam and more extensively in the central and southern Vietnam. *E.urophilla* has shown good performance on some degraded hillsides of the northern Vietnam, as it was recommended by experts from the Forest Research Center (FRC) in Phu Tho to be most appropriate for infertile land (Interview, March 10, 2010). On the other hand, *E. exserta* is popular and used for fuel production by the people in the northern midlands.

The main weakness of the *Eucalyptus* plantation program in Vietnam is that only *E.camaldulensis* has been used and the seeds only come from the district of Petford, Australia. Meanwhile, the plantation program in Vietnam relies only on a few tree species and provenance, in particular on *Eucalyptus* (TRAN 1993).

Which lands can be planted with *E. urophylla* and *Acacia mangium?* Based on

an investigation carried out by Do Dinh Sam, General Director of Institute of Tropical Forest Research and Development, farmers should plant *Acacia mangium* in good soil conditions and *E. urophylla* in degraded soil (Do Dinh Sam 2006), because *Acacia mangium* has bigger leaves, with an open crown, therefore the sunlight can directly penetrate the soil, eventually affecting soil fertility in the future. Therefore, *Acacia mangium* and *Acacia* hybrids have only been planted in southern Vietnam. In contrast, *E. urophylla,* which has smaller leaves, does not affected soil negatively, then eventually the hurmus content in the soil will grow. This natural forest process will improve previously degraded soil, helping it to become fertile again.

The response from stakeholders

The government

The Ministry of Agriculture and Rural Development (MARD) plays a significant role in the managing of forest resources, the agricultural sector and rural development in Vietnam. At the central level, MARD is responsible for the administration of forestry resources, giving land concessions to the private sector, land distribution to household farmers and managing land functions as production, protection and special use forests.[4]

The model used for encouraging rural communities to manage and develop protected and special-use forests is called "the benefit-sharing policy". In 2001, the prime minister issued two significant decisions on the management of natural forests and benefit-sharing covering: (1) the rights of households who sign contracts for and invest in protection forests. This regulation highlights that households have an obligation to plant, protect and regenerate forests, in accordance with the contracts signed with the forest management boards. As a reward, households have the right to collect fuel wood and non-wood forest products under the forest canopy (20 percent in timber forests; 30 percent in bamboo forests) and 85 to 90 percent of harvested products, after tax) and (2) special-use forests. The forest owners (households or individuals) are allowed to conduct harvesting, research and ecological tourism activities in accordance with the laws and regulations.

In brief, the benefit sharing policy deals with protected, special-use and watershed forests. It is significant in supporting forest conservation and improving the socio-economic condition of rural communities in Vietnam. Hence, the response from people, especially households, has been positive and they have actively engaged with the program.

After the allocation of forest land, cooperative relationships in forest production have arisen in many districts. The implication for the social participation of communities has been great. Many households took the initiative and invested capital and labor to organize production activities, such as tree planting, protecting and practicing agro forestry. Below are some examples of what activities households have participated in:

4 The decree divides special-use forests into: (1) national parks, (2) natural reserves, sub-divided into natural reserves and fauna and flora habitat reserves, and (3) historical, cultural and environmental relics or landscape-protected areas, see De Jong *et al.* (2006).

a) In Yen Bai Province, 9,500 farms combining forestry and agriculture have been established, representing 11.9 percent of the total farming households in the province;
b) In Lao Cai Province, 1,500 farms producing annual revenues of 15 to 20 million VND each (US$1,200 to $1,600).[5] Every farm has an average of three hectares of fruit trees or industrial crops;
c) In Thanh Hoa Province, over 13,000 households are engaged in forest gardens and forest farm production. The area of each farm is about five to ten hectares, with an annual income of 5 to 20 million VND per farm;
d) Many households that were allocated land that included denuded hillsides or depleted natural forests have planted trees and are able to produce enough firewood and timber for their own use. This effort made significant contributions to forest conservation, protecting biodiversity and the environment, soil improvement and much more (Ibid).

The government provides credit for stakeholders to plant trees as forest resources are considered strategic commodities to be exported as paper products. In the case of 195,000 hectares of planted trees, Vinapaco Company provides credit, seedlings, fertilizer, technical assistance, training and a guaranteed market for timber products to households, the cooperative sector and farmers. The company issued 10-15 million VND per hectare in the form of seedlings, fertilizer and maintenance until harvesting after 8 years. Tree planting started from 2008 in Phu Tho and will be harvested after 8 years (in 2016).

Plantation forestry, launched as a national policy to provide timber supply for the forestry industry, is located in production forests, the Department of Forestry (DoF) and the Department of Forest Protection are MARD's agencies tasked with focusing on forest administration.

The organizational structure of Vietnam's forest sector administration has four administrative levels: the central/national level, provincial level, district level and commune level. At present, Vietnam has 64 provinces, about 600 districts and 10,000 communes. All administrative levels are under the control of the state.

DoF in Phu Tho working with cooperatives

The role of the provincial DoF in protected, special-use and community forests is significant because the DoF has an annual budget for conservation forests from the central government. The DoF has a program to actively engage households to plant trees through 48 cooperatives that manage households to actively participate in tree plantation in Phu Tho Province. One of these, "cooperative X", in Phu Nich Village, Tu Da Sub-District, and Phu Ninh District, manages 18 households that own around 0.75-1 hectare each.

The 661 projects scheme obliges all households to plant trees to fulfill a target of

5 One U.S dollar was equivalent to about 12,000-13,000 VND in 2003, but in March 2010 one U.S dollar reached 19,000 VND.

5 million hectares of new forests. The regulation requires the following of households involved in the scheme: (1) the management of land under the scheme must be conducted by a cooperative consisting of several households; (2) the size of land must be at least 1-2 hectares per household; (3) the DoF officer will check the status of the land in order to obtain government subsidies, such as 1,600/per hectare of free seedlings and fertilizer.

The land registered for the project is 16 hectares and was initially planted in 2009 in Phu Nich Village. According to Nguyen Ngoc Than,[6] head of the cooperative, the program has had 3 positive impacts: (1) by planting fast growing trees in 2009, such as *Eucalyptus urophylla,* they are preventing soil erosion and protecting biodiversity; (2) the farmers get the profit from timber harvests after 7 years, estimated to occur in 2016; and (3) it will improve the socio-economic condition of the local community in the future (Interview, March 9, 2010).

However, there are some constraints faced by households in developing tree plantations:

1) There is no guaranteed market for the timber. Until now, no company has provided a guaranteed market for their timber. In this case, the role of the DoF as mediator between households and companies such as Vinapaco and Bapaco is necessary;
2) They need more seedlings and fertilizer for households, requiring assistance from financial institutions, such as banks, aside from the DoF;
3) They also require expert guidance for better performance of the plantation; and
4) The commitment of member households within the cooperative must be improved, following the regulations on attending regular meetings to solve their problemsand innovate planting in the future.

State Forest Enterprises

Vinapaco Company focuses on plantation forestry. The company is the second largest State Forest Enterprise (Fig. 2), after Bapaco Company. The main task of the company is to provide chip wood as raw material for Bai Bang Company. According to Vu Ngoc Pha, Manager of Silviculture for Vinapaco, the company created opportunities for the plantations and household farmers under the contract farming scheme in many districts. This scheme engages 30 households and the profit agreed by both parties is 50% for the household and 50% for company at harvest time. The company also contracts independent farmers to purchase their timber, while the company's own plantations total 80,490 hectares. The timber concessions are enough to last about 50 years and could be extended again, based on the company's performance. The company pays tax of 4% for land use and the government provides special treatment for Vinapaco of only 6.9% interest per annum to the government bank in order be able to accumulate capital for planting trees in huge areas.

6 Nguyen Ngoc Than was born in 1951 and is a retired Vietnam soldier from the 1960-1970s war with America. He was elected head of the cooperative in Phu Nich because of his leadership qualities and wisdom.

Fig. 2. Profile of Vinapaco Company in Phu Ninh District.

According to an officer of Vinapaco, there are some constraints to the development of the company:

1) The limitation of the production of forest land in Vietnam. The company cannot expand within Vietnam, so must expand in neighboring countries such as Laos and Cambodia;
2) Disputes with local farmers such as those who had been occupying the land previously, although they had no certificate from the provincial DoF;
3) Contracting with households at the district level is sometimes difficult because households sometimes use the land for agricultural purposes rather than plantations; and
4) Lack of sufficient capital to expand plantations. Therefore, a relationship with banks and other institutions such as the stock exchange is necessary in order to obtain fresh capital.

Vinapaco functions as a Forest Research Center (FRC) in Phu Tho in order be able to produce better quality seedlings. The FRC cooperates with the Australian Centre for Agricultural Research (ACIAR) and the Swedish International Development Agency (SIDA) with funding and research in order to develop quality seedlings. The research findings highlighted *Eucalyptus urophylla* (PN2) and *Acacia mangium* as the plants most suitable for the soil and climate in northern Vietnam (Fig. 3). Also, FRC developed and produced 3 million seeds of local trees such as *Sua, Cho Chi, Tram trang, Moraceae, Carabian, Mercury* and *Masrina.* These local trees were ordered by the provincial DoF and distributed in protected forest areas for the purpose of conservation. The production of commercial trees reached 4 million VND annually in 2009, growing again to 5.5 million seeds annually between 2011 and 2012. Seeds for the domestic market reached 75 percent, and 25 percent were exported. The domestic market is mainly companies, households and farmers planting for commercial use, as well as the 661 projects (see above). The export market of seeds is largely for

Taiwanese investors in forest plantations in Vietnam and Cambodia (50,000-60,000 *Acacia mangium* seeds annually). The cost of seedlings is 700 VND/seed for *E. urophylla,* and the price for *Acacia mangium* is 600 VND/seed. Individual farmers order between 2,000-3,000 seeds, and households for the cooperative sector purchase between 15,000-25,000 seeds. Companies purchase on average between 200,000-500,000 seeds each year.

Fig. 3. *Eucalyptus urophylla* seeds in the Forest Research Center.

The constraints faced by the Forest Research Center (FRC) (Fig. 4) are as follows: (1) a lack of budget for new technology development research. So far, the annual budget of about 15 billion VND is insufficient; (2) the attainment of intellectual property rights for new tree species findings, which creates difficulties in the self funding of activities through the sale of products in the market; and (3) an inability to expand international cooperation to improve seed quality (Ibid).

Fig. 4. The Forest Research Center Office in Phu Ninh District, Phu Tho Province.

Models of partnership company with farmers

Vinapaco has been working with 32 cooperatives under a contract farming scheme in many districts. In one example of this, fourteen households in Phu Ninh District in Phu Tho Province have established a cooperative with a total area of 34.3 hectares and called Commute Tu Da. The initial planting of *Eucalyptus europhylla* started in 2005. Ten Lem, the female head of the cooperative, owns approximately 2-4 hectares of this land. The land was originally owned by a community group in the village and was infertile and very difficult for growing vegetables and cassava. The community group then shifted to growing trees by planting *Eucalyptus europhylla* (Fig. 5). In the eight years it took for these trees to grow to harvestable size (2013), farmers planted vegetables and rice on their other more fertile land, and maintained livestock such as cows and pigs, and fish in the river.

Fig. 5. *Eucalyptus europhylla* planted by households in the formation of a cooperative in Tu Da Village, Phu Ninh District.

The head of community group Tran Thi Thanh Lam approached Vinapaco Company to establish contract farming and provide seedlings, fertilizer and credit for households while guaranteeing the market for their products (Interview, March 8, 2010). According to Ten Lem, the planting fee for 34.3 hectares was 96,562,801 VND and 64,859,105 VND for maintenance, creating a total capital expense of about 161,421,905 VND.

What about production?

According to a Vinapaco monitoring officer, the production reached 70 m^3 per hectare, making a total production of 2,380 m^3 (70 m^3/ha × 34 ha) which will be harvested in 2013. The Vinapaco Company has guaranteed a market for harvested trees, which will be determined in terms of price per m^3 of trees based on the spot market. Based on the estimation of tree quality and climate, the tree production will be fruitful

and farmers will obtain a profit from this business.

The profit share, according to a cooperative member, will be re-invested into the next planting of trees and other socio-economic needs of members, such as education and health for their children and savings in the bank (Interview, March 8, 2010).

The company has also cooperated with 70 independent farmers who own about 10-20 hectares of land for tree plantations. Buo Vaw Thu is one of these independent farmers who owns 17 hectares of land in Phu Ninh District and has been working for several years within the planning division of Vinapaco Company. The land was previously in a critical condition, originally owned by local farmers, and appeared unproductive and infertile, even with cassava crops. When Bu Vaw bought the land five years ago (2005), the price of which was 20 million VND/hectare. He used about 30 percent of his savings, while the remaining 70 percent of the price was obtained from a commercial bank with interest of 1 percent/month. He says that the total capital he used was 400 million VND to buy the land and manage the planting of trees in 2005 and the credit was to be paid back within 10 years, but he is optimistic that the plantation will yield a profit. He planted mostly *Acacia* hybrid on his land in 2005 (Fig. 6), some *Acacia mangium,* and bamboo as fencing. He was provided with the seedlings by the Forest Research Center (FRC) at a price of 600 VND/seed and bought fertilizer at 2,800 VND/kg from the market. Buo Vaw hopes that his plants will be harvested after 8 years (2013) and he estimates that at harvesting time he will produce 70 m^3/hectare, totaling 17 ha × 70 m^3 = 1,190 m^3 (Interview, March 8, 2010). He estimates the price of timber will be 620,000 VND/m^3 if the product is directly transported to the company, however, based on information from a company officer, if the company has to buy the product on the spot (in the plantation site), the price will be reduced to 590,000 VND/m^3. Buo Vaow decided to sell his timber directly to the company, so the price will be about 620,000 VND/m^3. The total amount he will make will be 1,190 × 620,000 VND = 737,800,000 VND, earning a profit in 2013 of 737,800,000-400,000,000 VND = 337,800,000.

Fig. 6. *Acacia* hybrid planted in critical land belong to independent farmer.

Timber consumption demand

The most rapid development of forestry industries occurred in the 1990s. Its impact on economic development was assisted by Vietnam joining the World Trade Organization (WTO). According to the Ministry of Agriculture and Rural Development (MARD), on the Anniversary of 50 years of forestry in Vietnam, the export of wood products such as furniture, veneers, plywood and paper reached US$2.5 billion in 2009. A total of US$1.1 billion was produced from the furniture and veneer industries, which accounted for over 42% of the country's export value in the wood processing industry (Cao Duc Phat 2009). For this reason, the forestry sector should be maintained and developed for future sustainable economic benefits. The impact of sustainable forest management was positive in shifting the livelihoods of local farmers, creating new jobs and attaining foreign exchange earnings.

There is a strong correlation between the demand of timber and the growth of sustainable timber in Vietnam. From the 1960s to 1980s, Vietnam harvested about 2 million m^3 of timber annually for civil and industrial purposes, excluding firewood, rattan and bamboo. Paper consumption reached 1.7 million tons in 2010 and is expected to rise again to 2.6 million tons by 2015 and 4 million tons by 2020 (Table 3). As a result, timber consumption for paper products such as pulpwood, plywood, sawmill, furniture, etc. will grow to about 5.5 million m^3 in 2015 (Table 4). As an example, Bai Bang Paper Company is producing about 40 percent of all paper in Vietnam. In 2008 it produced 110,000 tons of paper, twice as much as planned (55,000 tons) (http://www.baibang/evn_td.htm).

Table 3. Forecasted paper consumption (1,000 tons).

Products	2003	2010	2015	2020	Yearly growth(%)
Newspaper	54.8	92.8	133.4	192.0	8-9
Writing paper	159.9	295.2	451.0	690.6	9-11
Cardboard	680.1	1240.9	1880.9	2856.4	9-11
Others	75.8	138.3	209.6	318.4	9-11
Total	970.6	1767.2	2674.9	4057.4	9-11

Source: MARD (2006), De Jong *et al.* (2006: 20).

Table 4. Forecasted timber and forest product demands (1,000m^3).

Products	2003	2010	2015	2020
Timber: domestic and export	7420	14004	18620	22160
Large timber for industry	4561	8030	10266	11993
Small wood for wood based Panels	1649	2464	2992	1682
Pulpwood	1150	3388	5271	8283
Pitwood	60	120	160	200
Export value of timber products and NTFPs (million USD)	721	2400	3200	4000
Wood products	567	2100	2600	3200
NTFPs	154	300	600	800

Source: MARD (2006), De Jong *et al.* (2006: 20).

The timber for this industry originally came from both natural and plantation forests, but the government encouraged a shift towards plantations. The government provided easier procedures for obtaining timber concessions, easier access to credit from banks and other financial institutions, and tax relief for the import of machinery, upgrading infrastructure (port and high ways), the planting of trees, etc.

Development of pulp and paper industry

Challenges and opportunities for development (1970s-1990s)

Vietnam's first paper machine was established in 1912 and had a capacity of 2,500 tons annually (LE CHI AI 1995: 57). In the 1970s there were three large paper factories in the northern Vietnam: 1) Viet Tri, with a capacity of 10,000 tons per annum, and constructed with the assistance of the Chinese government; 2) a 5,000 tons per annum capacity mill; and 3) a mill south of Hanoi producing wrapping paper (JERVE *et al.* 1999: 48).[7] There are now also three state-owned pulp and paper mills in Vietnam: 1) Bai Bang (55,000 tons per annum) in Phu Tho Province in the northern Vietnam; 2) Dong Nai (20,000 tons per annum) in Dong Nai Province in the southern Vietnam; and 3) Tan Mai (48,000 tons per annum) also in Dong Nai Province. In addition there are 100 small-scale pulp and paper mills around the country (PESONEN 1995: 17).

Bai Bang Company

Bai Bang Company was established in 1974 through SIDA[8] funding of US$ 170 million. The project was the subject of huge debates in Sweden, especially during the 1970s and 1980s. In order to overcome the negative perception of this project, SIDA published an evaluation which concluded that "Bai Bang has proved to be an example of a sustainable development cooperation project" (BLOWER *et al.* 1999: 165). In total, SIDA contributed US$1 billion to improve Bai Bang mills to produce 55,000 tons per annum. Swedish experts are still obliged to develop Bai Bang mills, because Vietnam does not have enough qualified technicians to conduct the mill operations and provide the necessary spare parts and chemicals (SAYER 1991: 239). The first paper machine was completed in December 1980, the second in March 1982, and the pulp mill in September 1982 (HAMILTON 1989: 12). In April 2000, the mill employed 3,500 workers. In December 2001 it was announced that a further expansion of the mill would be conducted, expanding the plant from a capacity of 55,000 tons of paper per annum to 100,000 tons. The annual pulp capacity will be increased from 48,000 tons to 61,000 tons. This is the first stage of a plan to increase the mill's annual paper capacity to 200,000 tons and pulp capacity to 150,000 tons (Vietnam Panorama www 1).

The products of Bai Bang Mill are mainly distributed to the domestic market and regional markets in Malaysia, Hongkong, Taiwan, Sri Lanka, etc. Vietnam is expected to meet the demands for foreign currency by exporting paper, and SIDA was actively

7 See also, LANG (2002). Available from http://www.wrm.org.uy/plantations/information/Lang1.html (retrieved June 29, 2012).

8 Swedish Government Agency for Giving Aid (SIDA) to developing countries, including Vietnam.

engaged in promoting this export trade to Korea, Taiwan and Japan (LANG 2002).[9]

Tan Mai Paper Company

In the early 1990s, Tai Mai Mill and Dong Nai Mill were established in Dong Nai Province in the south of the country. Tan Mai Company is a state-owned business belonging to Vinapimex with a mill paper capacity of 10,000 tons per annum in 1990, which was later expanded to 48,000 tons per annum in 2000. Newsprint production accounts for 50 to 60 percent of the company sales. The mill originally sourced pine from Lam Dong Province, however, as there was not enough pine to supply the mill, machinery in the mill was adjusted to process eucalyptus. From 1999-2001, the Tan Mai Company posted more than US$1.1 million in losses as a result of its dependence on imported raw materials and the fall in the price of paper (SAIGON TODAY 19 June 2001).

Vinapimex Paper Company

Vinapimex is a state-owned paper corporation, established at the end of the 1990s. It is categorized as the largest single producer of paper products because it owns 11 factories, producing a total of about 170,000 tons a year. In September 2001, Vinapimex announced a plan to expand the pulp and paper industry in Vietnam, investing US$ 1.9 billion and involving 16 new pulp and paper production projects and an additional 693,000 hectares of plantations, thereby increasing Vinapimex's annual paper production capacity from the current 170,000 tons to 419,000 tons. According to industry forecasts, demand for paper in Vietnam is predicted to increase by more than 10 percent each year. Vinapimex estimates that US$3 billion needs to be invested in buying new machinery and plantations over the next 10 years, "to bring the industry up to scratch" (SAIGON TIMES 30 July 2001) (LANG 2002). According to SAIGON TIMES (29 August 2001), each year the industry is short by 189,000 tons of pulp and recycled paper, and relies on imports to fill the gap. Domestic pulp and recycled paper prices are about three times world prices, a fact that the Saigon Times blames on Vietnam's small production capacity and non-automated mills with obsolete and decaying machinery (SAIGON TIMES 29 August 2001).

Paper industry (2000s)

Since 2004, Bai Bang Paper has upgraded and expanded annual production to 100,000 tons of paper and 61,000 tons of pulp at internationally competitive quality and environmentally improved to national standards. The Vietnam Paper Corporation, in November 2006, announced plans to invest almost US$300 million to expand the Bai Bang Company, while Vinapaco plans to establish 250,000 tons per annum pulp production line at the Bai Bang site. A further US$100 million will be spent on "material forest zones" to expand industrial tree plantations, covering a total of 160,000 hectares

9 "Virta, J. 1996. Chairman of Jaakko Poyry Consulting, interview with Chris Lang, 30 August 1996." in LANG (2002).

in five provinces.

In May 2006, An Hao Pulp Factory in Tuyen Quang Province was established, planning to produce 130,000 tons a year. Japan's Marubeni Corp won a US$130 million contract to build the mill, which is now in the second phase and the government has approved an area of 380,000 hectares of forest to supply the mill. Another project, sponsored by the Saigon Export-Import Company, is an investment of US$150 million to build a 115,000 tons per annum pulp mill in Nui Thanh District, in the central province of Quang Nam. To supply the raw material for this mill, Quang Nam authorities have allocated 30,000 hectares of land for *Acacia* and *Eucalyptus* plantations. In September 2008, another company, the Tan Mai Paper Company, received permission to build four new pulp and paper operations in Quang Ngai Province: a paper mill in Dong Nai Province, a pulp mill in Lam Dong Nai Province, and pulp and paper mills in the central highlands of Vietnam. The projects will produce 550,000 tons of paper and 460,000 tons of pulp per year. Hence, the Tan Mai Paper Company plans to establish 10,000 hectares of plantations in Lam Dong Province to feed its pulp and paper operations. The company is also carrying out a US$30 million plantation project in Di Linh District in Lam Dong Province.[10]

In January 2007, Hong Kong based Lee & Man Hau Giang Paper Manufacturing plans to build a 330,000 tons per annum containerboard paper mill and a 150,000 tons per annum pulp mill in Vietnam. In line with the construction of paper mills, Lee & Man Hau Giang is reported to also be investing in plantation projects in Vietnam (Table 5).

Table 5. Private companies investing in pulp and paper projects and planned capacity (1,000 tonnes/year).

Company	Pulp	Paper	Types of products	Year
1.Vietnam Paper Corp				
Bai Bang Project-the II Phase	250		Bleached chemical hardwood pulp	2011
Than Hoa Paper JS Co	100	100	BCTMP, DIP, newsprint, PW	2011
Paper machine upgrading		30	Printing/writing paper	2010
Bai Bang Paper JS Co		50	PW, newsprint, LWC	10/2009
2. Tan Mai Group Co				
Long Thanh Paper Mill		150	Newsprint	2010
Kon Tum Paper Mill	150	200	BCTMP, coated paper	2011, 2012
Quang Ngai Paper Mill	40	70	CTMP, PW, newsprint, packaging	2010
3. Lee & Man Hau Giang Co	330	420	BJKP, packaging	2011
4. An Hoa Paper Co	130	130	BHKP, coated paper	2009,
	60		BCTMP	2010
5. Quang Nam Pulp& Paper Co	100		BCTMP	2012
6. My Huong Paper JS Co		45	Packaging	
7. Sai Gon Paper JS Co		230	Packaging, tissue, coated paper	
8. Phuong Nam Co	100		BCTMP	2011
9. Viet Thang Paper Co		50	Coated paper	2009

Source: VIETNAM PULP AND PAPER ASSOCIATION (2009).

10 Cf LANG (2008), and also see THANH NIEN NEWS, 28 June 2008, "Southern Firm to Build US$36 Million Pulp Factory in Central Highlands."

In a brief, the government policies on providing easy access to banking, infrastructure, investment mechanisms and tax breaks are encouraging investors to invest in Vietnam. Therefore, there is a correlation between economic growth and the consumption of paper in Vietnam. Consumption in 2008 reached 2 million tons and increased to 2.2 million in 2009. Meanwhile paper production increased from 1,114 million tons in 2008 to 1,133 million tons in 2009 (Table 6). In general, paper production in 2009 increased only 1.74% compared to 2008 due to a reduction in newspaper production by 66% compared to 2008. In 2009, only 40% of the total capacity was utilized, although printing/writing paper production and consumption increased by 3%. Most producers sold their products at production price, breaking even or at a loss for many months from the fourth quarter to the early third quarter. On the other hand, packaging production moved up by 15%, as most packaging enterprises are small-scale, therefore making it easier to restructure operations to match market conditions. Tissue paper production dropped 6.44% as the 2 tissue paper machines of New Toyo, with a combined capacity of 30,000 tons/year, were stopped for repairs, pulling the total output down by 15,000 tons. However, since May 2009, the newly installed tissue machines began operating again and have covered this downturn.

Table 6. The comparison of paper consumption and production (tons).

Unit	2008	2009	2009/2008 (+/-)
Production	1114416	1133831	1.74%
Import	1006394	1141190	11.81%
Export	117000	60000	-48.72%
Consumption	2003810	2215021	9.54%

Source: Vietnam Pulp and Paper Association (2009).

Economists quote a government report saying that it will boost the paper industry in an effort to make it a key economic sector in the next decade in order to fulfill paper domestic consumption. The strategy will apply two approaches: inviting foreign investors to build pulp and paper mills in Vietnam, and direct investment by the government itself. In terms of foreign investors, examples are Thailand's Siam Cement, which is investing in building a US$142 million paper mill to produce 220,000 mt/year of packaging paper by 2009, a joint venture at the An Hoa Pulp & Paper mill between Hanoi's General Export and Import Co, and India's Ballarpur Industries and Thailand's Martin Group are building a pulp mill in the northern province of Tuyen Quang worth US$200 million that will start operating in 2009. *Eucalyptus* and *Acacia* plantations have already been developed to feed these mills.[11] In terms of direct investment, Vietnam will invest more than USD 1,140 million in implementing 15 projects to produce pulp and paper, including USD 9 million to build a 15,000 tons tissue paper factory in Cau Doung.[12]

11 See "Vietnam Paper Industry: Flying Under the Radar", retrieved June 29, 2012, from (http://www/glgroup.com/News/Vietnam-Paper-Industry).

12 See "Paper Industry in Vietnam", News from Embassy of the Socialist Republic of Vietnam in the USA, February 4, 2001.

How to overcome paper consumption to production gaps?

At the end of 2009 there was indication that some big economies were showing signs of recovery. Vietnam's economy had overcome difficulties and seemed to be recovering, with a GDP growth rate of more than 5.8%. Export, which were in a negative growth rate, started to move back towards a positive growth rate, even though foreign direct investments were still low. At the time of the global economic downturn, the Vietnam paper industry restructured its operation and items. Investment in the paper industry remains continuous, products were sold out and large-scale investment projects were ahead of schedule. However, according to Vietnam Pulp and Paper Association, the competitiveness of Vietnam paper products has not significantly improved, and the products are still of lower quality and higher cost than in other regional countries. As a result, Vietnam still needs to import pulp and paper products from neighbors, such as Indonesia and Thailand.

The government, represented by the Ministry of Finance, announced a policy to reduce the import tax on paper by between 7 and 12 percent in September 2008, depending on the type of paper.[13] Several newspapers reported that the tax cuts were a result of proposals by the Pulp and Paper Association, however, Vu Ngoc Bao, Secretary General of the Association, told the Vietnam News Agency that the "reduction would seriously affect local paper producers, who were having difficulties reducing production costs in face of rising material costs. Foreign giants such as Japan, China, the US and South Korea challenge the competitive capacity of local producers."[14]

Provision of raw material

Due to the effects of a rapid increase in woodchip exports in the past few years, as well as the appearance of new pulp and paper mills, treeless areas are being covered by *Acacia* and *Eucalyptus* and the government has eased this growth with easy access for forest plantation concessions to private companies. This has greatly contributed to the rapid development of the pulp industry in Vietnam. The impact of the development of forestry industries such as pulp, paper, plywood, sawmill, furniture and wood demand is increasing. Vietnamese hardwood imports have increased from 1 million m^3 annually in 2003 to almost 4 million m^3 in 2008 and 2009. At least 80% of this imported volume is re-exported as finished and semi-finished products such as furniture.

Factories must use FSC-certified wood and attain FSC chain of custody certification if their products are to carry the standard's logo. Because wood product buyers in Europe, the US and Japan have increasingly demanded FSC-certified wood products, Vietnam now has a relatively high proportion of FSC chain of custody certified factories. Bai Bang Company is eager to obtain FSC-certification for its forest plantations through practicing sustainable forest management under the guidance of SFMI.[15]

13 See "Paper Shortage Leads to Import Tax Cut", VIETNAM NEWS, 5 September 2008.

14 See "Paper Projects Kick off to Cool Down Shortage", VIETNAM NEWS, 11 September 2008.

15 SFMI is NGOs which actively involved in socialization to obtain FSC-certified forest. It is abbreviation of Sustainable Forest Management and Forest Certification under the guidance of Dr. Vu Nham, Former chief cooperation and scientific Department of Vietnam Forest University. Interview with Vu Nham, on March 4, 2010 in Hanoi.

Another approach to increasing production is by recycling paper, accounting for 67% (2008) of the total amount of raw material used for paper production (except for joss paper, made by semi-chemical pulp), mainly used to produce containerboards, boxboards and tissue paper. 35% of waste paper is also used for newsprint. According to a Pulp and Paper Association officer, the recovery rate of used paper in Vietnam for recycling remains low, only 26%, accounting for 67% of total waste paper recycled (the remainder is imported) (Interview, March 5, 2010).

In February 2007, the MARD started a program to establish 2.4 million hectares of plantations over the next five years in the northern mountainous region. The plantations, according to Hua Duc Nhi, the Vice Minister of MARD, are intended to provide raw material for the pulp industry, which will annually produce 700,000 tons of pulp.[16] There is also the Five Million Hectares Reforestation Program (5MHRP), which is intending to plant one million hectares of industrial tree plantations to feed the pulp and paper industry.

Other actors also support the creation of plantations, such as the German government, which is establishing plantation projects in five northern provinces of Vietnam. The Asian Development Bank (ADB) has approved a US$45 million loan for an afforestation project in the central highlands and the World Bank is funding a Forest Sector Development Project in four central coastal provinces. These projects intend to plant 66,000 hectares of plantations.

Concluding Remarks

Plantation forestry in Vietnam has developed rapidly since the 1990s and 2000s. 600,000 hectares of plantation forests in 1990 increased to 1.7 million hectares in 2000s. This has had a positive impact on domestic and foreign investment, especially in the pulp and paper industry, providing cash to boost growth in the domestic economy and strengthening the socio-economic capacity of farmers in district and rural areas. Domestic paper production achieved 900,000 m^3 tons in 2005, 1,114,416 m^3 tons in 2008 and finally 1,133,831 m^3 tons in 2009. The rationale for this success is as follows.

First, the Vietnam government launched an economic reform, shifting from a centrally planned system to a market oriented economy. The main issue in the forestry sector has been the application of a policy of “land distribution” and “timber concession” areas to stakeholders such as households, individuals, the cooperative sector, private companies, state forest enterprises, etc. The government encourages ‘contract farming’ between the private sector and households, and individuals and the cooperative sector to plant trees as raw material for pulp and paper. This plantation scheme has impacted on the livelihoods of local farmers and income generation increased rapidly and the government now obtains annual foreign exchange earnings of

16 See Lang (2006) and also available from http://www.wrm.org.uy/bulletin/115/Vietnam.html (retrieved June 29, 2012).

US$2.5 billion from forestry industry products.

Second, the government has encouraged domestic and foreign investors to also be involved in a wide range of timber plantation activities, and gives incentives such as easy accessibility to timber concession areas, financial institutions, and tax relief on the import of machineries and more. This policy has attracted investors, private sectors, cooperative sectors, farmers, NGOs, donor agencies from international banks, such as the World Bank, ADB and foreign agencies such as CIDA, SIDA, JICA, GTZ, UNSAID, CIFOR, CIAR, etc., to actively engage to tree planting in Vietnam. The impact of this policy is that today, *Eucalyptus urophilla* and *Acacia mangium* plantations have increased, with a positive response from stakeholders, participating in the planting of trees on a massive scale. In spite of criticism from NGOs concerning the ecological damage from a wide range of fast growing trees such as *Acacia* and *Eucalyptus*, affecting soils, leading to floods and soil erosion during the rainy season, the government and other stakeholders have been positively engaged in tree planting in conservation and special use forests (protected forest area).

The rapid development of pulp and paper industry and plantation forestry in Vietnam shows a successful leadership and management, and certainly largely contributes to insular regions of Southeast Asia and includes Indonesia. One lesson to be learned concerns how to practice sustainable forest management (SFM), which can be realized three elements (economic, social and ecology). The government, private sector and local farmers make collaborative management in providing raw material (timber supply) by holding 'contract farming'. The private sector (company) provides seedlings, fertilizer, access credit to banks, and guarantees the market at harvesting time. The plantation forestry eventually affects the cash flow in rural areas, job creation and socio economic communities. The second lesson to be learned is the significant role of stakeholders (government, private sector and local farmers). The government has a significant role in giving concessions to the private sector, land distribution to the cooperative sector and households (farmers), giving access to financial institutions, relief tax for import machineries, providing infrastructure (port and highways), and encouraging contract farming between the private sector and local farmers. Third lesson to be learned concerns the purpose of the Forest Research Center (FRC) in terms of being able to produce better quality seedlings. FRC cooperates with other research centers such as Australian Center for Agricultural Research (ACIAR) and Swedish International Development Agency (SIDA) to develop quality seedlings with funding and research.

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References

Blaike, P. and Brookfield, H. 1987. Land Degradation and Society, 296 pp., Methuen Press, London, UK.

Blower, N., Ngo Minh Hang, Jamieson, A., Mc Carty, A., Pearce, D., Pham Quang Hoan, Quirke, D., Nguyen Quoc, Thomas, M., Do Thi Binh, Hoang Van Hoa, Warner, B. and Vincent, D. 1999. Paper, Prices and Politics: An Evaluation of the Swedish Support to the Bai Bang Project in Vietnam. Centre for International Economics, Sida Evaluation 99/3, Stockholm, Sweden.

Bryant, R. L., Rigg, J. and Stott, P. 1993. Introduction: Forest Transformations and Political Ecology in Southeast Asia. Global Ecology and Biogeography Letters, 3: 101-111.

Cao Duc Phat 2009. The Vietnamese Forestry Will Strongly Develop to the New Height. Journal of Agriculture and Rural Development, Vol.2 November 2009: 2 (in Vietnamese).

Central Institute for Economic Management 1998. Vietnam Economy in 1998, 75 pp., Education Publishing House, Hanoi, Vietnam.

De Jong, W., Do Dinh Sam and Trieu Van Hung 2006. Forest Rehabilitation in Vietnam: Histories, Realities and Future, 76 pp., CIFOR (Center for International Forestry Research) Press, Bogor, Indonesia.

Department of Forestry 2008. Forestry in Vietnam, 344 pp., Forest Sector Development Report, Department of Forestry, Hanoi, Vietnam.

Do Dinh Sam 2006. Impact of *Eucalyptus* and *Acacia mangium* in Soil Fertility in Vietnam, 34 pp, *unpublished paper,* Hanoi.

Do Dinh Sam and Le Quang Trung 2003. Forest Policy Trends in Vietnam. In: People and Forest—Policy and Local Reality in Southeast Asia, the Russian Far East, and Japan (Eds Inoue, M. and Isozaki, H.), 157-167, Kluwer Academic Publisher, The Netherlands.

Embassy of the Socialist Republic of Vietnam in the United States of America 2001. Paper Industry in Vietnam, 4 February 2001.

FAO 1999. State of the World's Forest 1999. Food and Agriculture Organization of the United Nations Press, Rome. Retrieved June 29, 2012, from http://www.fao.org/docrep/W9950E/W9950E00.htm.

HAMILTON, H. 1989. Vietnamese Pulp Project Helps Protect Ecosystem. World Wood, June 30 (3).

HIEU, P. S. 2004. The Changing Administration and Role of Forestry in the Economy of Vietnam. Small-Scale Forest Economics, Management and Policy, 3(1): 85-98.

JERVE, A. M., NORLUND, I., NGUYEN THANH HA and SUHRKE, A. 1999. A Leap of Faith: A Story of Swedish Aid and Paper Production in Vietnam—the Bai Bang Project, 1968-1996. Christian Michelsen Institute, Sida Evaluation 99/4, Stockholm, Sweden.

LANG, C. 2002. The Pulp Invasion: The International Pulp and Paper Industry in the Mekong Region, 220 pp., World Rainforest Movement, Montevideo, Uruguay.

LANG, C. 2006. Vietnam: What's Happening in the Pulp and Paper Sector? WRM Bulletin 115, World Rainforest Movement, Montevideo, Uruguay.

LANG, C. 2008. Vietnam: Paper Shortages, Price Increases, New Mills and More Plantations. WRM bulletin 137. World Rainforest Movement, Montevideo, Uruguay.

LE CHI AI 1995. Vietnam. Tappi Journal, 78 (6): 57-58.

LYE, T. P., DE JONG, W. and ABE K. (eds) 2003. The Political Ecology of Tropical Forests in Southeast Asia: Historical Perspectives, 293 pp., Kyoto University Press, Kyoto, Japan.

MARD 2006. Vietnam National Forestry Development Strategy 2006-2020. Retrieved June 29, 2012, from http://www.theredddesk.org/sites/default/files/viet_nam_forestry_development_strategy_2.pdf.

PESONEN, K. 1995. Indo-China Pulp and Paper Industry—Its Future Prospects. Paper Asia, March: 12-18.

PETERSON, G. 2000. Political Ecology and Ecological Resilience: An Integration of Human and Ecological Dynamics. Ecological Economics, 35 (3): 323-336.

SAIGON TODAY (newspaper) 19 June 2001.

SAIGON TIMES (newspaper) 30 July 2001, 29 August 2001.

SAYER, J. A. 1991. The Vinh Phu Pulp and Paper Mill. In: The Conservation Atlas of Tropical Forests: Asia and the Pacific (Eds COLLINS, N. M., SAYER, J. A. and WHITMORE, T. C.), 27-41, Macmillan Press, London, UK.

THANH NIEN NEWS (newspaper) 28 June 2008.

TRAN, X. T. 1993. Eucalyptus Plantations in Vietnam: Their History and Development Process. Regional Expert Consultation on Eucalyptus, 4-8 October 1993 Bangkok, FAO. Retrieved June 29, 2012, from http://www.fao.org/DOCREP/005/AC772E/ac772e0s.htm.

VIETNAM NEWS (newspaper) 5 September 2008 (Paper Shortage Leads to Import Tax Cut), 11 September 2008 (Paper Projects Kick off to Cool Down Shortage).

VIETNAM PULP AND PAPER ASSOCIATION (magazine) 2009. Development of Paper in Vietnam, 21-22, Vietnam Pulp and Paper Association. Country Report, Hanoi.