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THE BAI BANG PROJECT FROM A FORESTRY PERSPECTIVE

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A BRIEF REVIEW OF THE PROJECT

One year after the Tonkin incident in August 1964 - Olof Palme - at a “Social Democratic Party” meeting in Gävle criticized the American involvement in the conflict between the two Vietnams and brought forward the idea of aid to North Vietnam. It is commonly said that this was the starting point of the Bai Bang adventure.

In practice not much happened until 1967 when preliminary discussions gained speed - in Sweden between Sida and The Ministry of Foreign Affairs - and - on a diplomatic level with Hanoi - of how an aid program to North Vietnam could be formulated.

In 1969 at the Social Democratic Party Congress the then Minister of Foreign Affairs Thorsten Nilsson declared the government’s solidarity with North Vietnam and promised to give aid to the country and start the support soonest. The Swedish parliament decided on a three-year aid program to North Vietnam the same year. This caused a lively debate in Sweden as well as heavy criticism from USA. Should Sweden really support a country engaged in a full scale war? The criticism resulted in a more cautious approach and it was agreed that a broader aid program would not start until the war was over. Some humanitarian aid was however given during the early seventies.

However, in the spring 1970 it was decided, by the Swedish parliament, to support North Vietnam with 225 million SEK for the reconstruction of the country. The same year the Vietnamese declared that they wanted Swedish support to build up the forestry sector, or more to the point they wanted a “paper mill”. There were a lot of doubts at this stage whether a mill was the best option for an aid program or not - both at the Ministry and at SIDA. These doubts would persist during a long time.

In February 1971 the plans had advanced to such a stage that Jaakko Pöyry Ingengörsbyrå AB (JP), could be contracted to carry out a “prefeasibility study”.

In 1974, after several Jaakko Pöyry studies about location of the mill, raw material supply (not only wood), an air photo survey etc, it was finally proposed to construct a pulp and paper mill with the capacity of 48 000 tons of pulp and 55 000 tons of paper at a place, which would be known as Bai Bang. This place was located in the Vinh Phu province close to the Lo river (Song Lo in Vietnamese).

On the 20th of August 1974 a “Development Cooperation Agreement” was signed in Hanoi between the two parties, to construct the proposed pulp and paper mill with a calculated cost

of 770 million SEK. The project included a power plant, a water supply and purifying plant, a chemical plant, maintenance workshops, large air conditioned storage facilities. For the construction phase was also included a stone crusher, a concrete plant, an acetylene plant etc. It was also agreed to start the whole thing when the war was over. The agreement specifies the responsibility for both parties. Vietnam should supply trained personnel for construction and running of the mill, forestry workers, input of local material such as wood, cement, transport of imported goods and local material. Transport of expatriate personnel was also a Vietnamese responsibility. Sweden was to supply all equipment and machinery for the construction and erection of the mill and equipment for the forest operations. Construction and running of camps for the expatriate personnel was a Swedish undertaking. Pulp for the first years of paper production was also included.

On the 30th of April 1975 Saigon fell. So now it was possible to start digging and in September the ground works started at the Bai Bang site.

In 1973 WP system had been engaged as the main project coordinator. Silviconsult was engaged by JP during the preparation phase to cover silviculture issues.

1975 the first JP forestry experts came to Vietnam. Long term experts from Silviconsult were in place already 1974. JP and Silviconsult were contracted by WP and all personnel was de facto employed by WP.

In the forestry project WP was responsible for road construction, workshops, procurement and camps. Silviconsult for silviculture (species trials, nurseries etc) and JP for harvesting, transport, training etc. However, JP had the coordinating responsibility for the forestry program. It might look like a complicated set-up, but it functioned rather well.

In 1979 the consortium Scanmanagement was formed by the four companies (JP, Södra Skogsägarna, Cellpap and Ångpanneföreningen). From mid 1980 Scanmanagement took over the full responsibility for the project. Within the consortium JP/Interforest got the overall responsibility for the forestry part.

In June 1980 the power plant started to supply electricity and in December the same year the first paper machine produced paper with imported pulp.

The mill was finally solemnly inaugurated in November 26, 1982 and at that time all parts of the mill complex were in operation. The first deliveries of Styrax and bamboo arrived at the woodyard in the spring the same year.

At the end of June 1990 the project was terminated. With one exception however, in 1986 a separate project with its own budget the so called "Plantation and Soil Conservation Project" was rigged and it lasted until mid 1991. The total cost for the project amounted to about 2,7 billion SEK. A somewhat higher figure than the original 770 million SEK! (Sic!) It must however be kept in mind that during the course of the project a lot of so called "side projects" were set up for example a transport project, a vocational school, a housing area and living condition programs". And of course these figures are without adjustment for inflation.

THE FORESTRY PROJECT

Short general description

The goal of the forestry project was to ensure that the mill was supplied with enough fibrous raw material both in a short and in a long time perspective. I will here use the terms wood and wood supply and in these terms include bamboo. The goals of the forestry project were to be met through

- Finding out where accessible wood was available.
- Testing different species and establish plantations soonest and as close as possible to the mill.
- Testing different logging and transport methods including rafting.
- Construction of roads in the area to facilitate transports to Song Lo and directly to the mill.
- Procurement of road construction equipment, forestry tractors and other logging equipment, trucks etc
- Building up a maintenance organization including workshops and spare part stores.
- Training of forestry personnel including staff, machine operators, mechanics, loggers, silviculture and nursery workers and so on.

However at the start up of the project no one was aware of what all this really meant in practice.

Anyhow, during the course of the project a functioning organization for extraction of wood and bamboo was established. An extensive road construction program was carried out, even if we never reached the original goals when it came to kilometers built. A huge maintenance organization was set up including both stationary workshops and mobile units. A radio communication system was set up. During the project a huge machine park was built up including five big bulldozers, seven big excavators, six dumpers, five log trucks, one stone crusher and probably some other machinery too. A small factory for casting cement pipes was also established. Well, honestly this was really a big enterprise. To this came construction of Swedish camps in the forestry area. Training of Vietnamese personnel at all levels was carried out. The importance of training became more and more evident over the years. In a way the whole forestry project tended to be one big training institution.

It must also be mentioned that a Forest Research Centre (FRC) was located close to the mill and this institution was in operation at the start of the project. This centre was organized directly under the Ministry of Forestry (MOF) and played a very important role in the project. FRC was supported by the project both financially and with experts. FRC has today very advanced silviculture research activities. For example FRC has developed a method of mass production of cloned plant material of an Acacia hybrid (*Urophylla x Auriculiformis*). FRC has also a orchard for production of acacia seeds. FRC is today a part of the mill organization.

A forest vocational school located in Phu Ho, organized under MOF, was also in function from the beginning. The Phu Ho school became the forestry project's counterpart organization in all training matters. The Phu Ho school received substantial support over the years. The school was however closed down in the late nineties.

Organization and personnel

At the project start there was already a functioning Vietnamese counterpart organization, the "Forest Zone Construction Committee" (FCC in short) with an old army captain in charge. FCC reported directly to MOF. FCC was the formal recipient of all forestry equipment which caused continuous conflicts with the forest enterprises and the provinces. After various organizational changes a new organization was formed 1987, through a Swedish initiative, which was named "Vinh Phu Service Union" now with its head office close to Bai Bang. This was partly a consequence of the fact that the forest operations had moved closer to the Bai Bang area. All forestry project activities were now under one hat. This organization survived until the wood supply responsibility was moved to the mill.

When the project started the the main forestry activities were located to Ham Yen were also the experts were stationed. Only Silviconsults experts were stationed in Bai Bang where they worked within the FRC organization. In 1976 seven experts and instructors, only three with a forestry background, were stationed in Ham Yen. The number of expatriates increased gradually and in the middle of the eighties about 35 persons were on the manning schedule. Now located to Ham Yen, Tuyen Quang and Bai Bang. The number of expatriates decreased than rather quickly towards the end of the project. Only those working for the "Plantation and Soil Conservation Project" remained after 1990.

The wood supply issue

In the preparation phase a defined forest area, the so called "Raw Material Area", was allocated for the supply of wood to the mill. One main question during the feasibility studies was whether there was enough wood. Vietnam was at war and it was difficult, if not impossible, for the Swedes to visit the forest area. The Swedes wanted to take aerial photos to get a better picture and this was finally carried out. It is said that it was the old commander-in-chief Vo Nguyen Giap who at long last gave his ok. In a way it is rather fantastic that air photos could be taken when American bombs were falling over the country. I think that this really shows how important the project was to the Vietnamese government.

The project plan suggested to use a mix of Pine as a long fiber source and *Styrax tonkinensis* as short fiber source for the supply of wood to the mill. Before the pine plantations were ready the long fiber supply should consist of bamboo species. *Styrax tonkinensis* is endemic to VN. It has very short fibers, very low volume weight, a short rotation period (max 10 years). Plantations are established by direct sowing. Several thinnings are needed. For industrial forestry *Styrax* is of these reasons not a very good species. However, *Styrax* was to be used by the mill up to 2010 at a gradually decreasing rate.

Why pine and why bamboo? Tropical pines was early the answer to the need of wood in many parts of the tropics and subtropics. Different species were tried globally with good production qualities and extensive plantations were established. So why not in Vietnam too? *Pinus kesiya* was growing naturally in Vietnam and there were plantations of other pine species in the Tam Dao mountain area which looked fine. Preliminary tests started already in 1974. These early test plots were promising and tests with a more scientific approach started in 1976. The following species including different provenances were planted *Pinus caribaea*, *P. oocarpa*, *P. mercusii* and *P. kesiya*. The *kesiya* seed came from Hoang So Phi, an area north of Bai Bang with a higher altitude. Some provenances of *caribaea* and *oocarpa* looked most promising. *Caribaea* and *oocarpa* seeds came from Honduras, Nicaragua and Cuba. *Mercusii* is originally from Sumatra.

And the story about bamboo. Well! Bamboo is used for paper production mainly in India. In Vietnam bamboo was used for all sorts of construction purposes, as fuel wood, but also for paper production in small mills. The techniques for growing, harvesting and pulping was not very familiar to the Swedish experts and when it came to large scale operations not to the Vietnamese either. Many bamboo species are growing in VN. The main species for the mill was in Vietnamese called Nua with the scientific name *Neohouzeaua dollooa*. (To pronounce this is really a tongue twister!) But also other species were of interest. In the summer 1975 the Nua started to flower. Many bamboo species have the “bad habit” of flowering over large areas at the same time and after flowering culms die. So by the end of 1976 most of the Nua bamboo was dead in the area. Those former bamboo areas became partly covered by new nua stands. But large areas were sown by *Styrax*, planted with pine or to a large extent used for agricultural crops. The set back of bamboo hurried up the plantation of pines but before the mill was ready new bamboo stands were in place and bamboo was to be an important source of fiber up to the end of the last century.

At the start of the project rather large areas of *Styrax* and also another species named *Mangletia glauca* were established on state forest enterprise land. *Mangletia* was not liked by the paper makers due to its colored heart wood. There were also some smaller areas of eucalyptus. These plantations were cut down long before the mill was in operation.

As the tests of pine initially looked promising it was decided to start pine plantation activities on a broader scale. This was done before any evaluation had been performed. It was mainly some provenances of *caribaea* which were to be used. Two main forest nurseries were established one close to Bai bang and one 100 km north of Bai Bang in Ham Yen. A lot of smaller nurseries were also built at the forest enterprises.

The pine plantations were not a success. Very bad survival rate due to several reasons for example - bad soils, grass competition, insect attacks, land conflicts, grazing by cattle etc and so force. As an example - I made some inventories of one year old plantations in 1979 and registered a survival rate of only 10 percent. In short pines could not successfully be produced in the lowland area around Bai Bang. Or expressed in an unscientific way: “The main reason was simply that the species we tried did not like the specific climate conditions of the area.”

Pine continued however to be planted at a rather large scale through the eighties. It was not easy to change the state plans. How large the established areas were is uncertain, but anyhow, much lower than reported. From a level of about 1 100 ha 1987 the yearly plantations were phased out during the next years to come. I am not sure if any pine wood ever was delivered to the mill.

As I have said earlier there were some Eucalypt plantations when the project started close to Bai Bang. These plantations were established on poor soils and the production and quality was very low. This led to, that the confidence for eucalypts was very low among the Swedes. And also, the Vietnamese were very negative because of the wide spread opinion that eucalypts degenerated the soil further and lowered the ground water table.

However, despite a certain resistance from the Vietnamese side, trial plantations started with several eucalypt and acacia species. *E. camaldulensis* looked most promising and production plantations gained speed in the early eighties. A main portion of these plantations were established on degenerated land belonging to farming cooperatives south of Bai Bang. Large bulldozers with rippers or plows were used for soil preparation. The growth of these plantations was very limited, but the “bare hills” were transformed into something that looked like forests. About 3000 ha of *E. Camaldulensis* were planted during the first half of the eighties.

The worries about the wood supply persisted and the Swedes demanded that a new air photo survey should be conducted. This took place 1984 and covered a much larger area than the old RMA. It was however not possible to fly over areas close to the Chinese border. The results were somewhat difficult to interpret, but the official view was that there was enough wood and bamboo. But everyone was not convinced.

As the results of the air photo survey was not convincing especially concerning how much bamboo was accessible together with the bad results of the pine plantations and the low production in the eucalypt plantations it was decided to look for new species which were better adapted to the climate conditions of the area. Tests started with some selected Eucalypt and Acacia species and provenances. One provenances of *E. urophylla* and one of *Acacia mangium* turned out to be most promising and trials on a broader scale started around 1985. It must be pointed out that these plantations were established on far better soils north and north west of Bai Bang. The selection of plantation sites was a difficult and problematic affair, especially in the beginning of the project. It was not easy to change established land use plans. Production plantation of these two species gained however speed quickly. I do not think any more scientific evaluation was ever made. Especially *A. mangium* was a very long desired success. As it turned out these two species should be the only wood source for the mill.

During the period 1975- 1991 about 85 000 ha of plantations were established. This means of course not that, as said above, the real area was of the same size. Many areas were planted several times but reported as new areas. A conservative estimate, or guess if you wish, is that in 1991 there were about 25 000 ha of industrial plantations. To this figure must be added areas and trees planted in the “Plantation and Soil Conservation Project”. One component called “Social Forestry” of this project was directed to villages and cooperatives. And when

the land reform gained speed in the late eighties also to private farmers. During the period 1985-91 over 30 million seedlings were distributed together with fertilizers.

Some social aspects

The productivity among the forestry workers was very low. The bamboo cutters, mainly women, worked only about 150 days per year and something like three hours per day. There were several reasons for this. Bamboo cutting was really a very tough job in a climate which could be described as a Bombay summer and a Glasgow winter. The food supply was not well organized, the workers had to get time for managing their small gardens, chickens etc. The living and social conditions were deplorable, the female workers who mainly came from the delta areas had no experience of living and working in the forest. The women had difficulties to find partners in the female dominated forestry brigades and so on. In the project we were worried about the low production and wanted to solve it the Swedish manner through training, better tools, better pay and better living conditions. The Vietnamese said ok to training and to tools but the other issues were not any business of the Swedes. The Vietnamese classic solution was to transfer more people to the forest area.

When the mill was inaugurated a press conference took place with participation of among others the Swedish Industry Minister Roine Carlsson and the Forest Manager at that time Eje Lindgren. Eje got a question from one of the journalists about why the production was so low in the forest. Eje answered something like: "It is not so easy to demand a high production from girls working under slave like conditions. - "This led to black headlines in the Swedish press and questions were raised in the Swedish Parliament. And, SIDA got cold feet back in Sweden. The project and SIDA agreed to conduct a study to investigate the reasons for the low productivity including the social situation among the forestry workers and propose actions to improve the situation. This led to the much discussed report carried out by Birgergård/Larsson where they in a knowledgeable way described the situation and came up with some suggestions of how the situation could be improved. To make a long story short the living conditions were gradually improved both by Vietnamese actions and by project support. However the main reasons for the gradual improvements were probably the liberalization of the Vietnamese society, its view on the labor force and its more market oriented economy. The starting point for this liberalization was the communist Party Congress in December 1986 and the Vietnamese version of the Russian perestrojka, namely doi moi.

MILL PRODUCTION AND WOOD SUPPLY TODAY

One week ago I was in contact with the Mill's Forest Manager Mr Nha. He reported the following. - In 2012 the mill produced 62 700 tons of pulp and 95 600 tons of paper. The difference between these two figures makes up of imported pine pulp, mainly from Indonesia, and clay. The wood supply amounted to 224 600 tons of which Acacia 178 100 tons and Eucalyptus 46 500 tons. Thus close to 80 % Acacia. A somewhat surprising and interesting relation! No other species! Of the total delivery close to 146 000 tons or 65% came from the mills own organization and the remaining part from, I quote "other state forest companies and local farmers".

The mills forest land covers 44 300 ha of which 27 500 ha are plantations in four provinces and sixteen companies. The yearly plantation area for the mill's forestry department decreased from 4 100 ha year 2008 to 2 100 ha year 2012, mainly due to lack of suitable land. Over a 5-year period 95 % of the area was planted with Acacia.

An estimate of established forest plantations in the raw material area of Bai Bang.

Species	1969-79	1980-86	1987-91	Total (ha)
<i>Styrax tonkinensis</i>	21,000	9,600	14,100	44,700
<i>Mangletia glauca</i>	4,900	11,000	2,200	18,100
Pine mainly <i>P. caribaea</i>	700	3,800	1,700	6,200
<i>Eucalyptus camaldulensis</i>	300	3,000	4,600	7,900
<i>Eucalyptus urophylla</i>			4,600	4,600
<i>Acacia mangium</i>			3,600	3,600
Sum	26,900	27,400	30,800	85,100