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# Upgrading Strategy for the Rubber Value Chain of Smallholders in Bo Trach District, Quang Binh Province

by

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# List of Abbreviations

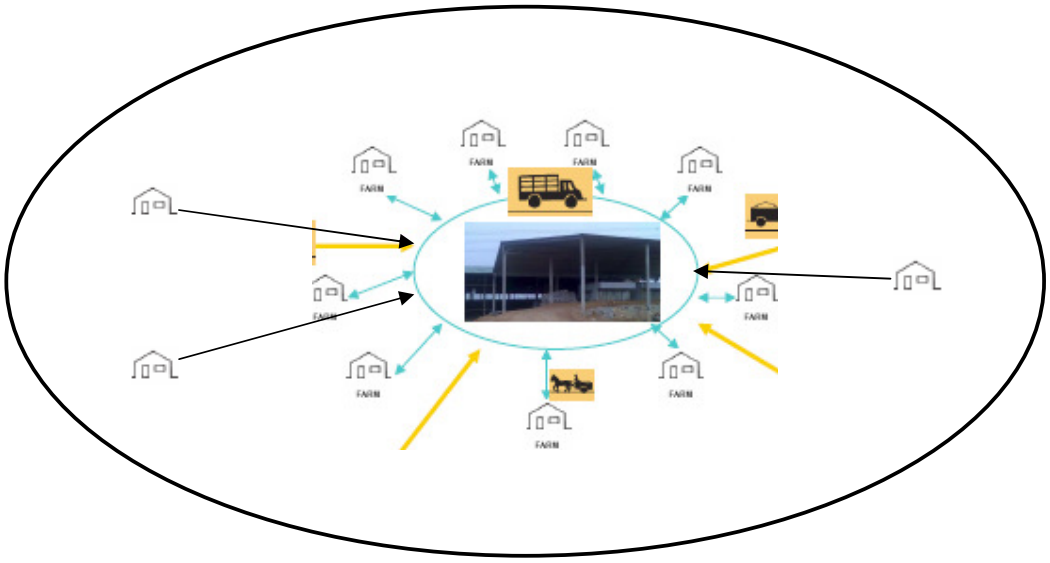
| | |
|---|---|
| ADP | Agricultural Diversification Project |
| AFD | French Devepment Agency |
| DRC | Danang Rubber Company |
| FAO | Food and Agriculuture Organization of the United Nation |
| GERUCO | General Rubber Corporation |
| GTZ | German Technical Cooperation |
| hhs | households |
| M4P | Making markets work better for the Poor |
| MARD | Ministry of Agriculture and Rural Development |
| NGO | Non Governmental Organization |
| ODA | Overseas Development Assistance |
| PPP | Private Public Partnership |
| PPP | Private Public Partnership |
| SME | Small and Medium sized Enterprise |
| SMNR-CV | Sustainable Management of Natural Resources in Central Vietnam |
| SOE | State-Owned Enterprises |
| SWOT | Strength, Weakness, Opportunity and Threat |
| VC | Value chain |
| VND | Vietnam Dong |
| VRA | Vietnam Rubber Association |
| WB | World Bank |

# Introduction

Rubber plantation in Quang Binh has a quite long development history under the government initiatives in forms of various rubber intensification programs such as mass rubber plantation by State Agro-Forestry Enterprises or National Program 327. Over the last 15 years, a large part of state rubber plantation land have been transformed to private rubber land, paving the way for the booming of smallholder rubber sub-sector, proved by an increase of 110.35ha plantation in 1993 to 1,140.68ha in 1998 under the National Program 327. During 2000-2008, the WB-funded Agricultural Diversification Project has further supported the smallholder rubber in Quang Binh with the total new plantation of 1,962.14ha. Still, development of smallholder rubber could not be sufficient with only the expansion of plantation but need a certain qualitative accumulation of know-how, labour capabilities and capital to achieve higher productivity. More importantly, with the exposure of the agricultural sector to the global market, rubber smallholders have no other choice than to take dynamic moves towards more market-oriented production as well as to join efforts to get higher economic benefit or value addeded despite globally harsh competition. In this sense, with the advisory of relevant public and private stakeholders, the GTZ Technical Assistance Project 'Sustainable Management of Natural Resources in Central Vietnam (SMNR-CV) has chosen the Value Chain approach to address core issue and identify potential upgrading strategies that are feasible and create a quick-win situation for farmers, agribusiness and the SMNR-CV project.

The typical mode in the production of liquid latex from the rubber tree to the processing of blocks of raw rubber is that of rather large scale commercial plantations. Plantation economy includes typically the on-farm processing of latex, due to the critically short time span between the extraction of the latex from the tree to the processing step (maximum of 8 hours). Therefore, on larger scale plantations the logistics of the whole process is organized in a way that harvesting in different areas of the plantation is coordinated, and the supply with latex to the factory ensures a continuous flow of operations. Ideally, the factory is located in the centre of the plantation to reduce the distance from the tree to the factory. Infrastructure like good access roads and transport vehicles facilitate the process. This locationally optimized pattern also applies to the state-owned rubber plantations in Vietnam, including those in Quang Binh province.

**Figure 1 Model of Rubber Plantation**



As illustrated by figure 7 (at the end of this paper), the logistics of the process becomes much more complex, when small holder farmers are the main suppliers of the processing factory. In this case, logistics is of essential importance. The distances between individual farms and the factory are longer; farms are geographically more disbursed than on a plantation. In addition, road infrastructure is often difficult, as is the case in the area of Bo Trach district in Quang Binh. Nevertheless, the small scale farmers are geographically concentrated in some neighbouring communes; and the privately owned rubber processing factory is located in the centre of this production area.

The difficulties in logistics have opened opportunities for a variety of middlemen, such as collectors, traders, pre-processors, etc. Sometimes one operator fulfils only one function; in other cases partly integrating several of these steps. Overall, all the operators in the value chain, from farmers, via middlemen to the factory, cooperate with the other operators, and they are mutually dependent on each other. The specific case of the rubber value chain of smallholders in Bo Trach district therefore carries a number of characteristics of a **production cluster**.

Thus, rubber smallholder farms, due to the requirements of critical land acquisition, follow a geographical agglomeration pattern. This geographical agglomeration is rather easy to recognize in the case of smallholder rubber in Quang Binh, where 2 main rubber agglomerations are located in the former Forestry SOEs: Le Ninh Forestry SOE in the western region of Le Thuy district, and Phu Quy Forestry SOE in the western region of Bo Trach district. Since the latter one consists of a higher population of rubber smallholders, this paper further narrows its scope to the rubber smallholder agglomeration in Bo Trach district. The cluster covers the administrative boundaries of some communes such as Phu Dinh, Tay Trach, Hoa Trach and the north-western area of Viet Trung Forestry town (see maps, figures 6 and 7).

Based on the GTZ-project's technical and value chain research on the Rubber value chain and various interviews held recently with a number of key actors along the value chain, we have identified major constraints confronting the development of the smallholder rubber value chain. In a further move, we have come to primarily study and test the feasibility of an upgrading strategy for the smallholder rubber value chain in Bo Trach.

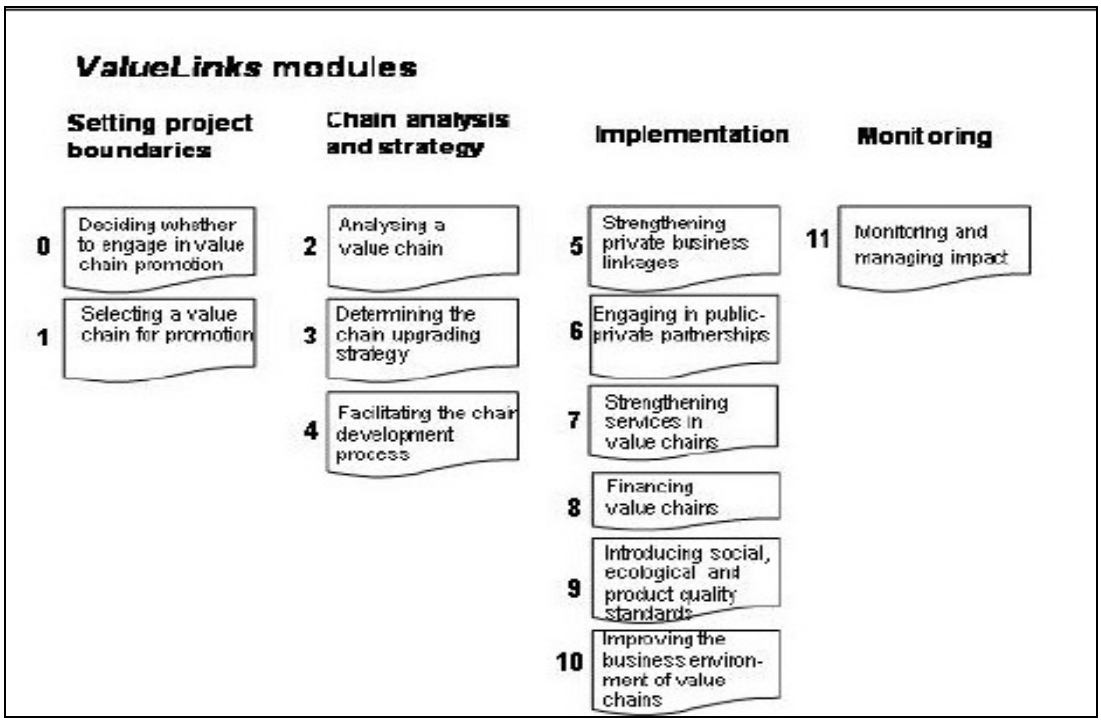
The paper presents an analysis of the key value chain actors and of the critical systematic constraints currently confronting the entire value chain. Then, it comes to reflect the outcomes of numerous discussions and interviews with key players and focus groups on the most feasible upgrading strategy. This upgrading strategy is focused on the organization of the liquid latex collection system'. In more detail, the paper briefly presents the implementation plan, critical success and risk factors and expected impacts of the strategy on individual actors, associated partnerships and on the value chain as a whole.

# 1. Theoretical Inputs

## 1.1 Value Chain Approach

In the present paper, the value chain approach is understood as in illustrated in following figure.

**Figure 2: Process of value chain approach**




(source: ValueLinks Manual, GTZ Eschborn, 2007)

The paper is built on the platform of the Value Chain methodology (Kaplinsky R., & Morris M., 2000). The logical steps of the application of the approach derive from the ValueLinks manual developed by the GTZ. This manual, in practice, highlights the process-oriented value chain approach (Gibson, 2008). Stages of the value chain application start from the selection of potential value chains (or sub-sectors), based on prioritized criteria, e.g. sector growth and size, potential for value-added, value chain actors' interests and ownership, etc..; followed by the analysis of the value chain for which discussions amongst key stakeholders are organized to work out the chain mapping, and a SWOT analysis on systematic constrains and critical success factors of the value chain.

Based on the analysis follows the strategy design to upgrade the chain which brings in main features such as long-term vision, market-driven approach, actors' dynamism, systematic change in response to systematic constrains, prioritized areas and sustainability of interventions. Based on the strategy, a detailed work plan is elaborated and agreed among all stakeholders, including binding commitments. This is considered as the most important step in the value chain promotion and needs to be pushed by lead players' coordination role and participatory contribution of all other value chain actors. Intervention activities are diverse, but can be grouped in several themes: critical skills, new ideas, linkages, associations, standards and regulatory/policy reform (Gibson, 2008). Finally, the monitoring and evaluation of the

value chain promotion process measures the achievements of actors' performance and overall impacts on value chain development. This paper limits its discussion to only the value chain analysis and strategy design phases of the local rubber value chain.

**Vertical and horizontal linkages in a value chain**

Vertical linkages are linkages between different actors along a value chain, i.e. between inputs suppliers and production firms, or distributors and final customers. Horizontal linkages are linkages amongst actors at the same chain level of the value chain, i.e. linkages amongst rubber processing firms, or between value chain actor with other supporting institutions and embedded service providers of the value chain, i.e. linkage between a production company and a market research institute, technical university or with an advertisement company. Since a value chain is a chain of players who act to add value to a product or service provision from the inputs/beginning form to the end of the product formation or service provision at the final customers' utility, strengthening vertical linkages between actors of a value chain can create synergies leading to higher value addition along the whole value chain. This is subject to functional upgrading (Kaplinsky R., & Morris M., 2000), which is defined 'increasing value added by changing the mix of activities conducted within the firm or moving the locus of activities to different links in the value chain'. On the other hand, horizontal linkages with technical and commercial entities can stimulate the innovation of products, namely product upgrading, or change processes of production, defined as process upgrading. These three types of upgrading: functional, product, and process upgrading are the only elements of an upgrading strategy related to the value chain approach. However, recent developments of the value chain approach do not refer much to this categorization. Value chain practitioners tend to focus more on dynamic and market-driven upgrading strategies, based on embedded vertical and horizontal linkages along and bound to the value chain.

## 1.2 Farmer Organizations and commercial Partnerships with Agribusines

According to Mancur Olso (1965), groups of shared-interests individuals can facilitate collective action amongst group members to effectively achieve a common goal; and group formation is also one way to reduce transaction costs and ultimately, enhance the competitiveness over non-institution individuals. (Eirik G. Furubotn & Rudolf Richter, 1997). The issue of farmer organizations has been given more attention in the working agenda of rural development. The debate is on-going on how to establish organizations of farmers and producers functioning and how to bring commercial, not only social and organizational benefits to member farmers. Due to bad experiences with the historical kind of production cooperatives, most Vietnamese farmers initially hesitate with ideas of groups and organizations. Hence, in order to help farmers overcome this hesitation, facilitating the establishment of farmers organization needs to entail visible outputs and tangible benefits realized for member farmers in contrast to non-members, i.e. sales of member farmers could be 20% higher than that of non-members, the volume of quality product could be 10% higher than that of non-members.

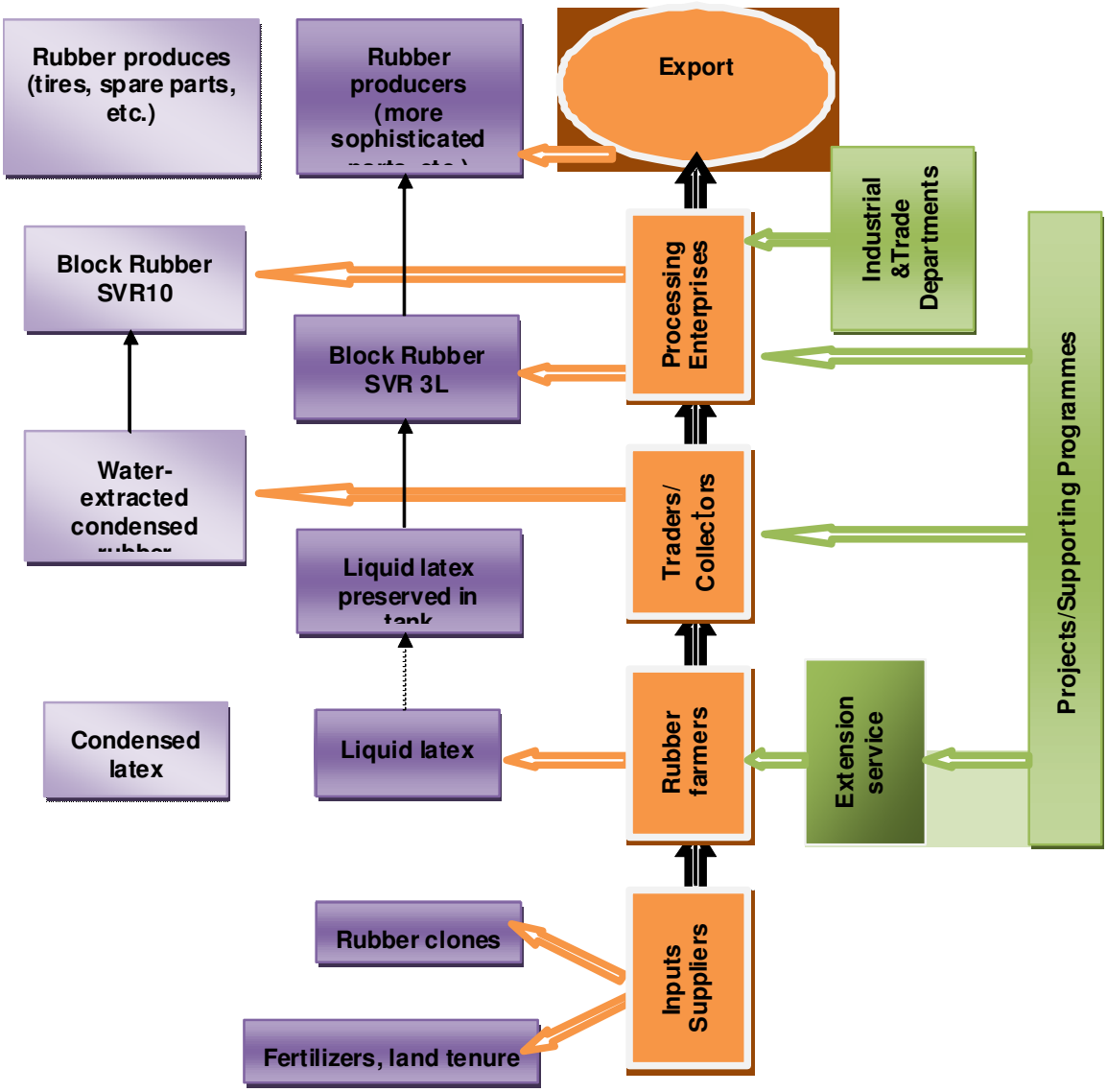
Nowadays, farmers can practically form official or unofficial organizations quite easily. Official organizations, under the law of Vietnam, can be cooperatives, professional associations, and notably a newly-created type, the "Cooperative Group", introduced by Government Degree No. 151 in October 2007. Unofficial groups of farmers are often initiated by NGOs, ODA projects and governmental institutions as an effective tool for channelling their support to as many farmers as possible. Only official farmer organizations, however, are entitled as legal entities and could conduct commercial contracts with other business partners, thus opening more room for realizing commercial impacts for the member farmers.

Who can be the business partners of a farmer organization? It should not be difficult to find out that agribusinesses and traders are closest to farmers. These potential partners are lo-

cated downstream next to farmers in the agricultural value chain and conduct further processing and trading of farming outputs. According to World Bank's ADP Report in 2007, agribusiness and farmer organizations can form a productive partnership which is long-term, voluntary and commercial-based, with a vision to enabling farmers' production becoming more market-oriented and warranting agribusiness on raw material supply. Eventually, both parties of the partnership can enhance their market competitiveness.

## *2.* Analysis of Smallholder Rubber Value Chain in Bo Trach

**Figure 3: Chain mapping of small rubber value chain**




(own source, 2008)

## 2.1 Analysis of main Actors of the Value Chain

Rubber smallholders

At present, there are up to 1,100 rubber smallholders in Bo Trach, of which more than 700 households have rubber at the production stage (rubber plants over 8 years old). The current plantation area of rubber is 1037 ha, with an estimated average productivity of 1,01 tons rubber/ha/year, equal to 3,03 tons liquid latex/ha/year, giving a total latex output of up to 3.157.1 tons in 2008 and increasing at a moderate rate in the years onwards. Smallholder rubber production areas by communes are Phu Dinh (361 ha), Tay Trach (321 ha), Hoa Trach (248 ha), Nam Trach (110 ha), and the north-western region of Viet Trung town (300 ha).(source: Agricultural Diversification Project (ADP) in Quang Binh, 2006, Project Phase-end Report).

Latex tapping takes place in a period of about 9 months every year, with some rest during rainy days, and rubber leaf-falling season by around February to March every year. Since liquid latex transforms into condensed form within 8 hours after tapping, farmers often practice mixing some other substances such as water, potassium, etc. to the latex to keep it in liquid state before being collected by collectors or traders. The content of real latex in the farm output of such mixed products containing water varies from a ratio of 10:6 to 10:5. The farmers' practices of mixing different kinds of substances with the liquid latex results in more and more in a discouragement on the side of traders to work out this tricky game. At present, a small number of farmers sell little volume of their latex in liquid form to the new processing factory directly. Still, the quantity of liquid latex collected by this narrow channel is far below the capacity of the processing factory, and is not yet economically viable for any of the parties involved.

Normally, farmers transport the water-containing condensed latex to the nearby trader at an average distance of 1,5 - 2 km. For economic and logistic reasons, farmers choose the nearest trader to sell their latex, but they can always go further to another trader if being offered a higher price. Alternatively, the farmer can go to the local market, where always more than 2 traders are based with their rubber business, and where the competition for quantity and price allows more market opportunities for farmers to sell their produce. Thus, each farmer often has persistent relationship with 2 rubber traders, who can occasionally give them short-term credit, with amounts ranging from 3 to 10 million VND, depending on how much latex output the farmer can regularly supply.

According to the economic analysis of the ADP, the average investment cost for each hectare of smallholder rubber is around 21 million VND for the period from 1$^{st}$ year to the 8$^{th}$ year. When the rubber trees start to become productive (business stage), farmers get on average 3,3 tons of liquid latex per year, equivalent to 1,1 ton of block rubber per year . According to interviews with farmers in March 2008, the current ex-farm price of liquid latex is 10,000 VND/litre, 14,000 VND/kg for water-containing condensed latex, and 19,000 VND/kg for water-extracted condensed latex (extracting water by a machine of the trader). At these market prices, if farmers sell liquid latex, they will get around 33 million VND income from 1 hectare per year. If they sell condensed latex, they will have about 1.65 to 1.95 tons of water-extracted condensed latex, thus earning 31 million VND each year from 1 hectare. So, the difference between selling liquid and condensed latex is about 2 million VND per hectare per year, which is quite promising and attractive for rubber farmers.

To sum up, rubber smallholders are in a relatively strong position in this value chain which can therefore be classified as "supply-driven"., Farmers see the fact that their bargaining power is relatively high and realize an even higher potential benefit from their small-scale rubber plantations. They are mostly well-off farmers when engaging in rubber with a relative high accumulation of land owned with a secure title and substantial cash money from daily latex tapping.

Traders Network

The network of rubber traders/collectors has been functioning quite harmoniously in parallel to the expansion of smallholder rubber. Notably within the concerned area, the network of traders is somehow distributed evenly over the whole area. There are 2 main traders in each of the three communes, with the exception of Viet Trung town where the density of collection points is higher. Interviews with some communal traders have identified up to 6 big traders originating from Viet Trung Forestry town, of which 3 extend their latex collection to the other communes. Though some competitions for latex collection occur here and there, the level of competition is deliberately maintained at a low level.

However, faced with increasingly unpredictable contents of water in the condensed latex sold by rubber farmers, about 5 out of 12 traders have invested in a small machine for extracting water from farmers' latex. Now, only extracted-water condensed latex is weighted by traders. They buy this kind of pre-processed raw rubber at a better price (19,000 VND/kg) compared to 14,000VND/kg for water-containing condensed latex. Traders then resell this water-extracted condensed latex to a processing factory at a price of 22,000 VND/kg. Deducting around 1,5 million VND of cost incurred by machinery depreciation, fuel, water and labour for water extracting of condensed raw latex, they get about 1,5 million VND for 1 ton raw material trading. If they collect liquid latex at price of 10,000 VND/litre from farmers, they can re-sell it to the processing factory at a price of 13,000 VND/litre. Deducting overhead costs for sale persons and logistics of about 1 million VND per ton, they would gain 2 million VND for 1 ton liquid latex trading. The surplus margin of 0.5 million VND between liquid and condensed latex trading should be adequately convincing to most traders. One other factor added to higher readiness of the traders to go for liquid latex is that since trading of liquid latex has to happen within the same day of latex collection, their cash flow, hence, will become more liquid and less exposed to price fluctuations.

Comparing profit gain from trading per ton of liquid latex and condensed latex:

**Table 1: Profit gain for trader in trading of liquid and condensed latex**

| Cost item | Trade in liquid latex (VND) | Trade in condensed latex (VND) |
|---|---|---|
| Buying cost per ton of raw latex | 10,000,000 | 19,000,000 |
| Depreciation cost | 150,000 | 200,000 |
| Electricity and water cost | 80,000 | 300,000 |
| Labour cost | 150,000 | 200,000 |
| Transport cost | 540,000 | 650,000 |
| Loss during collection and overhead cost | 80,000 | 150,000 |
| Total production cost | **11,000,000** | **20,500,000** |
| **Price per ton** | **13,000,000** | **22,000,000** |
| **Profit per ton** | 2,000,000 | 1,500,000 |

(source: own research)

On average, each commune-based trader has the collection coverage of 40 to 50 households living nearby. Each household produces around 40 to 50 kg of water-containing latex per day. The trading capacity of each trader often varies from 1,3- 1,7 tons per day. In many

cases, traders are also rubber smallholders and their rubber trading originates and depends to a large extent on their long-time close relationship with fellow farmers of the same village, who share the same customs, culture and social values, namely the social ties. Therefore, most traders believe that they can retain their supplying farmers and get the rubber business developing continuously.

Whereas the upstream linkages with supplying farmers are rather locally persistent and simple, it is interesting to look at the linkages downstream with the processing factories/facilities. It has surprised us to learn that most traders bring their traded produce to a processing factory, then rent the processing facilities to do the processing themselves. Quite often, 2-3 traders gather their produce and upload to a 10-15 tons truck to transport to a processing factory in Quang Tri (more 100 km away). Doing business with processing facilities in Quang Tri is an economically doubtful practice, but has been predominant for a long time, due to the troublesome trading with the two state-owned rubber companies (SOE) in Quang Binh: one located just near the small holder production cluster in Bo Trach, and the other one in Le Thuy district. There are 3 traders acting as collection agent of a small processing enterprise based about 30 km far from the locality. Higher gain from shorter distance allows these traders to offer a higher price to local farmers, leaving the remaining traders the risk of being left behind in the value chain.

At this point, we all agree that this linkage is the most critical one along the local rubber value chain. With a newly-established processing enterprise located in the heart of the rubber cluster, Lan Thanh rubber processing company Ltd., has opened a great opportunity to improve this linkage. To proceed with the study, it is worth to take a look at the most downstream actor in the local value chain: the processing factories.

Processing factories

There are presently two rubber processing SOEs in Quang Binh province, both of which are not at all commercially-oriented partners of local rubber farmers and traders. There are 3 private processing factories: a rather small facility located in Dong Hoi city, about 30 km away from the cluster in Bo Trach. Lan Thanh processing enterprise has started to operate in January 2008 with new production lines located in the heart of the rubber area. A third private operator is a brand-new factory upgraded from a trading business, located in Viet Trung Forestry town, about 7km from Lan Thanh enterprise. Several processing facilities in Quang Tri province could be considered as competitors to the local factories, since they have taken some moves to get raw latex from the locality.

There is not really enough information available to identify the capacities of individual processing factories, apart from Lan Thanh with a full capacity of 3,000 tons per annum of final product (block rubber, equivalent to about 9.000 tons of latex). Given the total area's output of over 9,000tons raw latex, it well justifies for the Lan Thanh enterprise to set its goal for larger number of outgrowers, and expanding to 2 the rubber communes of in the neighbouring Tuyen Hoa district with 60 ha production rubber in 2008. Also, competition amongst the three private factories for raw material will be increasingly harsh. Lan Thanh enterprise can have a technological competitive advantage over the two other ones, but it should not neglect the experience and long-time relationships with farmers that are accumulated by its competitors.

As illustrated in the chain map above, processing of liquid and condensed latex gives two types of block rubber: SVR 3L and SVR10 respectively. Lan Thanh has both production lines, while the two others only have SVR10 production facility.

Comparing profits gain from producing per ton of SVR 3L and SVR10:

**Table 2: Profit gain for processing factory in production of rubber latex**

Unit: VND

| Cost item | Block rubber SVR 3L | Block rubber SVR10 |
|---|---|---|
| Cost of raw latex for production of 1 ton block rubber | 39,000,000 | 37,000,000 |
| Depreciation cost | 320,000 | 500,000 |
| Electricity and water cost | 600,000 | 1,000,000 |
| Labour cost | 180,000 | 300,000 |
| Packaging cost | 50,000 | 50,000 |
| Management and overhead cost | 150,000 | 150,000 |
| Total production cost | **40,300,000** | **39,000,000** |
| **Price per ton** | **44,000,000** | **41,000,000** |
| **Profit per ton block rubber** | 3,700,000 | 2,000,000 |
| **Profit per ton raw latex** | 1,233,333 | 666,667 |

(source: own research)

Gaining higher profit from SVR 3L, Lan Thanh is seeking to increase its collection of liquid latex to the optimal proportion of 80% liquid latex and 20% condensed latex. To achieve this, they plan to select in each of the surrounding communes one key trader to integrate into their own system of raw material supply. They have listed 5 potential traders out of 12 as most active traders and potential partners. The remaining traders are either collection agents of other private enterprises or are unwilling to cooperate with the Lan Thanh company. With the network of partner traders, Lan Thanh hopes that each of them can collect from 800 - 1,000 litres of liquid latex each day, amounting to a total of 6 tons per day for its processing line.

It is quite understandable Lan Thanh company plans to outreach further for raw material. There will be direct selling of latex by rubber farmers living close to the factory, thus benefiting both farmers and the Lan Thanh. For the production area outside the area of direct collection from farmers, Lan Thanh will probably establish their own collection points and invest equipments as well as transport means for these collection points. The own collection system of Lan Thanh might make up to 30% of total inputs needs of latex, the other 70% are planned to be supplied by the network of cooperating traders. The vision for the period after 2010 will be a 3 times higher input volume of which 80% supplied by their cooperative traders.

It should be noticed that Lan Thanh processing factory is approved for establishment by provincial and district authorities in a vision to tapping into the raw material area of smallholder rubber in Bo Trach. Though it is not officially mandated with a kind of Corporate Social Responsibility, by nature of the locational factor and the motivation of the entrepreneur, whose homeland is Tay Trach commune, Lan Thanh takes itself responsible to ensure that rubber raw material is procured in full quantity, timely and at good price for all rubber farmers, thus warranting farmers' income and optimizing the social benefits of the entire agglomeration.

## 2.2 Underlying Constraints of the Smallholder Rubber Value Chain

Though SWOT analysis is the next step of value chain analysis, this paper does not present this elaborated analysis. Instead, an exploration of underlying constraints of the value chain is more relevant to the outcomes of 'focus groups'[1] discussions.

Actors of the local rubber value chain have expressed some critical constraints as follows:

Increased crowding in the value chain causes stiff competition for raw material. Only one-third of rubber trees in the whole are yielding latex at the moment, the rest will turn to yield stage incrementally in the years onwards. Meanwhile, the value chain is attracting more and more workers, traders and some new rubber processors who over-anticipate the business potential by the rapid expansion of new rubber plantations, yet not fully aware that only a limited proportion of the rubber trees planted have so far turned to the yielding stage (after 8 years). The market, in consequence, is crowded with traders who are engaged in different supply chains for some competing processing factories. This structures the entire value chain into a typically supply-driven pattern with a strong influence at the upstream end. Moreover, it also provokes farmers to harvest premature rubber plants, i.e. plants below 7 to 8 years old, for more latex output in order to take most of price advantages as a direct result of raw material competition.

Premature harvest takes place quite commonly in the agglomeration, raising concerns amongst agricultural extension staff and local authorities about the sub-sector's lower productivity in the future. The productivity of local rubber smallholders is currently only 1,01 ton rubber/ha/year as compared to the South of Vietnam, where productivity is about 1,6 to 1,8 t/ha. In fact, this is a large extent also attributable to more favourable agro-climatic conditions in the South. Attributing to the concerns over the low productivity is the harvesting method itself. The recommended method is one day latex collection, one day off, namely S/2 d/2, or even one day collection, two days off S/2 d/3. Though, some rubber smallholders, due to their shortage of cash money, practice S/2 d method, meaning latex tapping takes every day. Over exploitation of rubber would extremely harm the physical growth of rubber barks, thus substantially reducing the productive life span of the rubber tree from 30 years to less than 15 years. In terms of trade relation, the abusive latex tapping would also lead to a systematic problem, that is a price-driven competition which turn would lead to even lower quality..

The quality of raw latex is attributable to both objective and subjective reasons. The proportion of pure latex varies, depending on the collecting time during the day (at 4-5 a.m. is normally premium quality latex), and the month in the season. The average proportion of high quality latex in 1 unit rubber produce is 3 units raw latex (Le Gia Trung Phuc, 2006, Technical Rubber Report) Recently, due to premature and inappropriate harvesting methods, together with farmers' tricky mixing of other substances to the raw latex further increases have been observed in the water proportion of the raw latex which has adversely affected the average quality of raw latex. In the case of rubber, low quality latex can only produce low end category of rubber blocks, i.e. SVR10. In addition, the processing of low quality raw latex entails a much longer (double) processing time, thus longer use of machinery, and higher expenses for electricity, water, labour and notably, environmental cost for rubber waste. All key players who are most conscience and proactive for this local industry have expressed their readiness to move away from the production of this low end rubber block to produce higher quality rubber.

[1] 'Focus groups' are in-depth discussions with small groups of six to ten people who matches with a set of criteria (in terms of demographic, psychographic, ect.), which the discussion usually lasting one to two hours.

Another element that could hinder the competitiveness of the rubber value chain in the longer-run is the small-scale plantation of rubber trees by smallholders. The majority of smallholders have rubber plantations of less than 1 hectare, while rubber smallholders in some Southern provinces of Vietnam such as Dong Nai and Binh Phuoc hold at least 2 hectare of rubber plantation (Vietnam Rubber Association). Too small-scale rubber plantations often lead to inefficient use of necessary resources and increased overall social cost, be it the redundant use of labour force for tapping latex and higher cost for cumbersome logistical collection of small latex volumes from numerous different places. Coordinating such a network of too small-scale producers for an innovation initiative or for other development plans are apparently more challenging and subject to a high risk of failure.

## 2.3 Opportunities

On a global scale, the demand for natural rubber is increasing mainly for two reasons:

1. In the “traditional” rubber countries (such as Indonesia, Malaysia, Thailand, Brazil) with much more favourable agro-climatic conditions and higher productivity, rubber trees are replaced – on a very large scale - with higher yielding crops, such as oil palms and others. This has lead, over the last 3 to 4 years to a shortage of supply. Simultaneously, previously marginal production regions with less favourable climatic condition (e.g. in the south of China, all over Laos, Cambodia and the south of Vietnam) very large new areas have been planted with rubber trees, but these plants are not yet productive.
2. Natural rubber and synthetic rubber can be freely substituted for most final products, such as car tires. Synthetic rubber is made from crude oil. With sharply increasing prices of crude oil over the last two years, even sky rocketing as of recent, the demand for natural rubber is sharply increasing. at a rate of around 12% annually. This trend has been reflected in the substantial increase of market price for natural rubber in international markets with up to 10% price increase, as well as climbing export volumes of Vietnam natural rubber. In 2007, Vietnam has become the fourth largest rubber exporting country followed by Thailand, Indonesia and Malaysia. The prospect of the rubber sector in Vietnam is even brighter in the near future with the reduced supply of world leading rubber export country-Thailand, due to the heavy flood in this country in early 2008 (Vinanet, 2008).

For the smallholder rubber cluster in Quang Binh where most of the trees planted come into production during 2008 and 2009, the situation determined by the above two main factors opens a window of opportunity that is estimated to last for at least another 4 to 5 years.

With regards to categories of rubber products, according to VRA, high-end categories such as liquid rubber, block rubber SVR10 and SVR 3L are consumed more to manufacture sophisticated parts for automobiles, machinery and many other supporting industries. Since the local industry in Quang Binh is capable to produce 2 of these high-end categories, it should be able to capture a greater share of its output market with higher quality products and reliable proof of an environment-friendly production chain. The persistent commitment to these two elements is pre-requisites for creating a good marketing image for the local rubber value chain with potential importers.

# *3. Selected upgrading strategy: Liquid latex collection system*

## 3.1 Description of the upgrading strategy

Vision and objectives of the upgrading strategy

The strategy to upgrade the processing of condensed latex to liquid latex and to organize the liquid latex collection system is to bring *higher premium benefits to rubber value chain actors*, to initiate a sustainable *win-win partnership between rubber smallholders with trading and processing agribusinesses*, and ultimately to increase the *competitiveness of the local value chain* in the regional and global market places.

The overall objective of the upgrading strategy on organization of liquid latex collection system is to overcome the underlying constraints currently confronting value chain actors and capture market opportunities. Specifically, the upgrading strategy on liquid latex collection system will aim to absorb up to *80% of raw latex in liquid form* and the rest in condensed form. The organization of the collection system for liquid latex will initiate a strong partnership between the private processing factory, the rubber smallholders and active traders, which aims to involve at least 50 % of the total number of smallholders and traders in the value chain.

Organization of the liquid latex collection system

The idea of organizing the liquid latex collection system was initiated by the entrepreneur of the Lan Thanh rubber processing company as an outgrower policy to ensure the inputs supply for its processing capacity. I was thus, initially, a step in the supply chain management strategy of Land Thanh with the sole objective of ensuring profitability of the company. The company first intended to set up their new collection system with mainly new collection agents employed by the company. By working together with major supporting projects and extension networks on holistic analysis of the value chain, a more strategic solution of incorporating the current trader's network is jointly devised in order to *take advantage of the current traders' capacity as well as their long-time relationship with rubber smallholders.*

Over the entire area of smallholder rubber plantation in 5 communes, there will be 5 collection points set up at the heart of each of 5 communal rubber plantation areas. Each collection point will be run by a commune-based trader who is selected by the company as a reliable supply agent and be willing to engage in this collection system. Since each trader normally maintains a supply base from 40-50 rubber smallholders, targets for traders engaged in this new collection system will be 60-80 rubber smallholders as a permanent supply base. This target is feasible because the collection of liquid latex requires shorter time cycles than for condensed latex, being restricted to the maximum time window for the liquid latex of less than 8 hours to enter the processing stage. A shorter time cycle in the collection means lower requirements on resources, i.e. trucking, tank and manpower, deployed for the trading business and allows them to capture a broader supply base which would eventually increase the efficiency of their business (see Figure 6: Liquid latex collection system).

In order to set up collection points facilitating the fast logistics activities required for liquid latex, actors in each collection point should be well aware of their roles in pushing up the entire collection chain from farm places to collection points to the processing plant. Each actor needs to fulfil his/her task within a set time window, say, 4 hours for rubber stallholders to tap and transport latex to the collection point, 2 hours for collection agents to collect all latex and bring it to the larger tank assigned to the collection point, and finally 2 hour for truck transport by big latex tanks to the factory. Setting up a solid partnership amongst these actors is therefore a pre-condition for the feasibility of this collection system. In this sense, the upgrading strategy is not innovative in technology but instead, innovative in the commercial relationship

and networking in the agricultural value chain which aligns a partnership of actors to working in a collective framework.

Apart from the partnership sensitization of actors, there is a need to mobilize tangible assets to operate this system. Each of the 60 to 80 smallholders in one collection point should be equipped with an off-road motorbike for safe transport of liquid latex regardless of weather conditions. Collection points need medium-size trucks and suitable tanks (3 tons) to contain liquid latex. At the processing factory, the production line of liquid latex and measuring tools for checking liquid latex quality, one truck and large tanks collecting liquid latex from nearby households or from other districts as a strategy of out grower's expansion.

The cost calculation of necessary assets for the entire collection system is as follows:

**Table 3: Investments of actors for the liquid latex collection system**

Unit: USD

| *No.* | *Investment* | *Quantity* | *Price* | *Amount* |
|---|---|---|---|---|
| **I** | **Investment of the processing factory** | | | **52,042** |
| 1 | Additional equipment for liquid latex processing | | | 31,000 |
| 2 | 2 -tons truck | 1 | 20,000 | 20,000 |
| 3 | Container tank | 2 | 3,067 | 6,134 |
| 4 | Measuring tools for checking liquid latex quality | 2 | 2,454 | 4,908 |
| **II** | **Investment of 5 collection points** | | | **188,605** |
| 1 | 2- ton truck | 5 | 20,000 | 100,000 |
| 2 | Container tank | 5 | 3,067 | 15,335 |
| 3 | Measuring tools for checking liquid latex | 5 | 2,454 | 12,270 |
| 4 | Premise building for collection point | 5 | 12,200 | 61,000 |
| **III** | **Investment of rubber smallholders (on average 50 households/each collection points) for total 250 households in the entire system** | | | **439,950** |
| 1 | Off-road motorbikes for transporting liquid latex from rubber farm to collection points | 250 | 1,250 | 312,500 |
| 2 | Small buckets for containing liquid latex on the motorbike | 700 | 3,5 | 2,450 |
| | **Total budget** | | | **565,597** |

*(source: own research)*

It should be noted that the investment by the processing factory for establishing the liquid latex collection system is, by far, much higher than above mentioned budget estimates. The current processing lines which cost more than 4.2 billion Vietnamese Dong in early 2006, serve for processing of either condensed or liquid latex. Aiming at up to 80% of production capacity for the processing of liquid latex, the processing factory's own investment needs to be incrementally mobilized further to guarantee the upgrading strategy functioning at the value chain upstream.

Necessary investments on the side of rubber smallholders can be realized by farmers themselves quite easily, except for a few poor smallholders whose rubber plantation is only in the first year of yield stage, having cash shortage problems. The collection points are co-managed by commune-based cooperative traders and smallholder groups who supply raw latex to respective collection points. An appropriate management mechanism for the collection points could be that private traders decide and conduct the sufficient and quality-certified latex collection from member smallholders and transport the liquid latex to the processing factory, while smallholders manage their own resources, i.e. tapped latex, workers, motorbikes, time.. to transport latex to the collection points. The investments on the premises of the collection points should be made by the private traders, for the easiness of acquiring estates ownership. Meanwhile, investments in trucks, tanks and measuring tools can be shared by member smallholders. The investment sharing for the establishment of collection points, thus, need to come along with profit sharing made by the collection points. This matter, still, underpins the complexity of financial management for these actors. It would be ideal to break off this bottleneck by calling for a Private Public Partnership (PPP) scheme that partlyfinances the investments of the private trader-smallholders joint establishment of collection points.

Formal organization for producers

One precondition for acquiring a PPP grant is the consolidation of 2 actors: smallholders and traders under a united legal entity representing the private partner. There remains the issue of properly organizing formal groups of smallholders and private traders in each collection point. There are 3 kinds of formal organization of producers.

1. A "Cooperative" is legal alliance of individuals who share common objectives, investment and economic benefits; conduct production and business activities together. Cooperatives act similar to private enterprises relative to governmental economic management and procedures for getting an operating license.
2. A "Professional association" is a formal entity of producers from the same professional industry/sector/sub-sector which is mandated to support its members in technical and advisory fields relating to its specific industry. Collaborating group is introduced by Decision 151/2007 of the MARD in October 2007.
3. A "Cooperative group" is defined in the related Degree 'as a kind of voluntary association of citizens for shared benefits and joint liabilities, operate on democratic and mutual benefit principles, enjoy financial autonomy, self-finance their operations and discharge their liabilities with their own and their members' assets'. It is structured similarly to a Cooperative but is simpler in terms of managerial organization. The Communal People Committee is assigned to approve the establishment of a collaborating group in order to easily establish this kind of farmer group .

In this sense, collaborating group is the most suitable organization to gather rubber smallholders and trader in each of the concerned communes under a formal group. The collaborating group can be quickly approved for establishment by the commune-level People's Committee of the respective commune as long as there is firm commitments amongst its members for the shared objectives, benefits and liabilities to the operation of the collection

system; and a written cooperation contract reflecting the contents of cooperation activities. Other regulations relating to group size and managerial mechanism are quite flexible to adapt to the specific context and preference of the group formation. Still, there needs to be some facilitation to support the founder members in the process of group establishment with regards to visualizing benefits of the collaborating group, encouraging the voluntary joining of farmers and consolidating interests of different members-to-be. Such support should come from the extension workers, district officials or a project / programme. Facilitators of this initiative should be well aware of common psychological factors hindering the concerned actors to join a collaborating group, such as bad historal experience with cooperatives' practice, intransparent management of raising funds and sharing benefits, doubt referring to the sustainability of the group, etc...The better the facilitators and initiatiting persons can respond to such concerns, the more farmers will be convinced to join the group and the more likely is the success of such a group in the long-run.

## 3.2 Feasibility assessment of the upgrading strategy

Expression of interests by value chain actors

There have been several needs assessments of value chain stakeholders to identify the potentially best upgrading strategy for the rubber value chain in the locality. One official needs assessment was conducted officially with key rubber smallholders, traders and district authority by the former Agricultural Diversification Project-Phase I (ADP), with the outcome that the system of condensed latex collection was not viable to secure income for rubber smallholders as well as traders. The ADP has quickly responded to this finding by encouraging one entrepreneur to set up the Land Thanh processing factory in the heart of the rubber area. Now that this company has started operating with its production lines for both condensed and liquid latex processing, some other rounds of needs assessment targeted to upstream actors have been unofficially conducted by my working team, in order to get their reconfirmation on their interests and readiness to enter the upgrading strategy on organization of liquid latex collection system. Apart from the strategy on productivity improvement for rubber smallholders and processing factory by technical trainings targetet at different actors, only the term 'liquid latex' is repeated by all actors of the value chain when talking about potential solutions for situation improvement. Obviously, collection and processing of liquid latex is not new in large-scale rubber plantations of SOEs and private firms in other regions of the province and of Vietnam, but in the context of small-scale rubber in the locality, the liquid latex production, if successful, is considered as an innovation of joint efforts and networking amongst a large community of small-scale producers.

The motivation of rubber smallholders to join the liquid latex collection system is a higher ex-farm price, thus a higher income (by about 6,4% compared to selling condensed latex). It is also time-saving to collect liquid latex and bring directly to the collection point within 1 to 2 hours after tapping. Being encouraged by the trader who has bought their produce for a long time about the prominent prospect of liquid latex, farmers are more eager to become members of the upgraded system. With support of liquid latex measuring tools for checking the norm of pure latex vs. water content, shifting to liquid latex is one of most decisive elements in standardizing the quality of the raw material supply, which in turn, improve the quality of commercial relationships between farmers and traders, and of the traders with the processing factory. In a supply-driven value chain, suppliing farmers would not see at once their ultimate benefit to join a quality-driven upgrading effort. Yet, since liquid latex produces higher quality rubber products and on the other hand, saves one-third of production costs for the processing factory as well as reducs the loss for traders, these downstream buyers will continuously encourage their suppling farmers to stay with liquid latex collection with increased premium price for liquid latex.

Incorporating the quality-driven feature to the current supply-driven value chain is actually the strategy to sustain the commercially interests of all actors. Business partnerships that emerge from the strategy are therefore commercially productive and sustainable. As profit margins for traders and the processing factory before and after upgrading to liquid latex collection and processing are 33% and 85% respectively, they should take initiative to call for more and more rubber smallholders to join this partnership as well as to absorb high and higher proportion of liquid latex vis à vis condensed latex into the upgraded system. Their commitments to rubber farmers should also include milestones to bridge gaps amongst actors in surplus gains from the upgrading, be it currently 6.4% for rubber farmers, 33% for traders and 85% for the processing factory. Apparently, farmers should be better motivated with higher surplus gain shared by processing factory down to traders, but they also need to trust the partnership with traders and processing factory through transparency of the benefit distribution amongst the concerned players.

Critical success factors

The upgrading strategy is likely to succeed thanks to some critical success factors as follows:

The proper planning of rubber plantation in the district has been accompanied with strong support of local authorities and donor-funded projects, thus internally increased productivity of rubber supply area, pushing for the implemention of a quality improvement strategy. Since 15 years ago, the municipal authority has carefully planned and controlled the expansion of smallholder rubber plantations in these 5 communes. The sub-sector planning has been persistently pursued through the separated land use planning for rubber and land allocation to selected households that are capable in terms of technical know-how, human resource and a certain degree of specialization for rubber plantation. For example, in order to become entitled for a rubber plantation, farmers had to apply for rubber plantation up to a specific number of hectares to the district authority, then the district panel screened the capacity of applied households in terms of labour, current cultivated crops and family income. Only then the household was allocated land for rubber plantation with a Red Book in which the total area was less than the area applied for. The district's active involvement right from beginning has produced positive impacts on the reasonable use of land resources as well as income structure of household economics. *This is a fundamental factor to the solid infrastructure of the rubber supply areas, giving an internal push for the upgrading plan to be built on.*

There are other initiatives and readiness of actors downstream to pull the entire value chain closer to the market demand side. As actors staying in the downstream end of the value chain are closer to the market and better understand the market demand as well as competition pattern in the rubber industry, their strong interest and readiness for the liquid latex upgrading plan can act as a *market force to pull the entire value chain during the implementation of the upgrading strategy.*

The rationale of *push and pull to a value chain* has been considered to be critical to any upgrading strategy. Value chain is a chain of value-added activities and of interdependent actors, so the pushing force at the upstream end and pulling force at the downstream end are likely to work out in value chain upgrading rather than kick-off interventions that could improperly distort the features of linkages along the value chain.

Liquid latex has been traded and processed since some years ago. Better organizing the collection system increases the chance to succeed in a short time period. *Liquid latex, as analyzed in above section, is not a radical innovation in this case, but an incremental innovation* (Dornberger et al, 2008). This upgrading strategy has ahigh chance to succeed because it is concerned with taking isolated 'liquid latex' practices into an organized sequential system, thus increasing the volume and frequency of these practices.

Risk factors

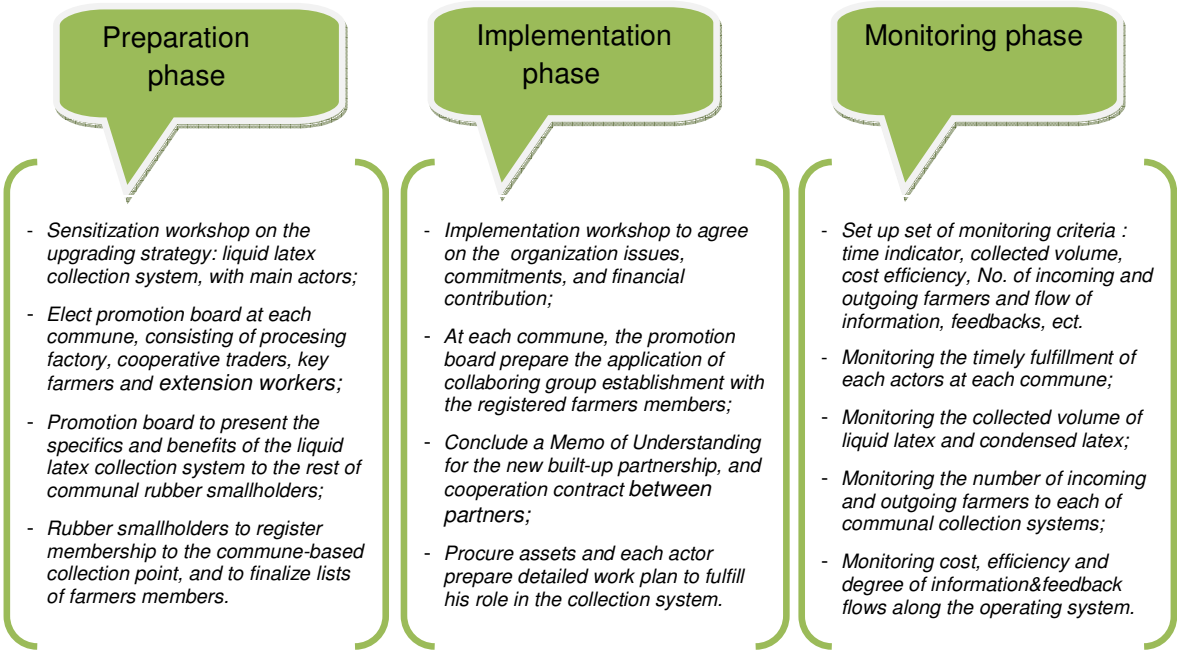
*Farmers may not be able having liquid latex available within the time window set for them*. Normally, farmers begin tapping latex from early every morning at about 4.00 to 5.00 a.m till 7.00 a.m. If they collect condensed latex, they need more time to mix other substances to the liquid latex to make it condensed, then it depends on them to bring the latex to traders for selling. In a liquid latex collection system, they are given the time duration of 2 hours after tapping to transport the latex to the collection points. Some farmers might not be able to always meeting this time line. To reduce this risk, each farmer should practice the simulation of latex tapping and transport to collection point from their rubber farm several times under different weather conditions to figure out the most likely constraints to their routine and find solutions to overcome these constraints.

Collection agents for other processing factories which process condensed latex practice price dumping to collect condensed latex.

In the same rubber cluster, there are some other small processing factories producing condensed latex. These facilities need to collect condensed latex and have set up their collection channels via some loyal traders. It has happened, and will happen in future that traders of different processing factories fight for raw latex supply competing with higher prices offered for farmers' raw latex. This risk can be mitigated by the flexibility of the collection system, which can also operate with condensed latex, if farmers decide to stay with condensed latex. The aim is that keeping farmers to join and stay in the new collection system in the short-run, whether they decide to sell condensed or liquid latex, in order to gradually build up the 'soft' capacities of this network, i.e. effectiveness, harmony of actions, trust, etc. in the long run.

## 3.3 Work plan of the strategy implementation

**Figure 4: Work plan of the strategy implementation**



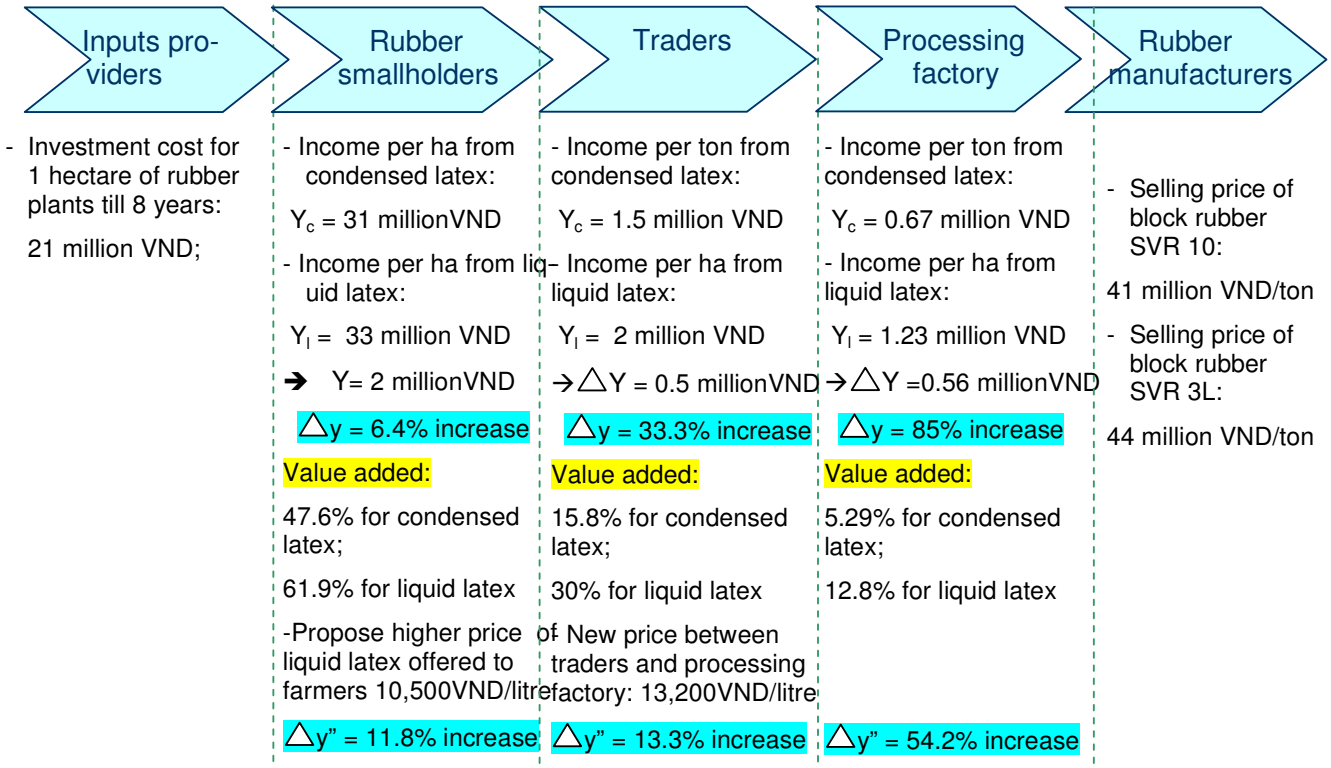
(own source, 2008)

In all phases of the proposed work plan as presented above, there is a need to identify actors to take an initiatiing role in carrying out the activity, targeted objectives and outcomes of the activities. For example, at the end of the preparation phase, each commune-based promotion board should have the list of participating farmers registered into the collection system.

## *4. Expected impacts of the upgrading strategy*

### 4.1 Value added and economic returns for partners

**Figure 5: Value added and profit surplus gained by value chain actors**




(own source, 2008)

The figure analyzes surplus profit gains for different actors of the value chain when upgrading from condensed latex to liquid latex. Starting from rubber smallholders, for each hectare of business rubber, the surplus gain from selling liquid latex compared to condensed latex is 2 million VND, or an increased benefit of 6.4%. The value added that rubber smallholders contribute to the value chain's produce is the percentage of income change and inputs cost, which is 47.6% for condensed latex, and 61.9% for liquid latex. For the traders, they will get a surplus margin of 33.3%, and the value added attributable to the rubber trading is 15.8% and 30% respectively for condensed and liquid latex. The value added created by traders is quite high compared to their intermediary role and relatively low investment compared to farmers and the processing factory. The processing factory get the greatest surplus gain of 85%, and

their value added to the raw latex inputs is 5.29% for condensed latex and 12.8% for liquid latex**.**

Under the assumption that the market price of block rubber remains unchanged, the strategy aims to increase the surplus gain for rubber smallholders to better encourage them. Scenarios of different prices offered to farmers have been tested. When prices increase to 11,000VND/litre liquid latex, either the traders or the processing factory will have to accept a negative margin. This seems not convincing for these 2 actors at the beginning of the partnership. Therefore, only 10,500VND/litre is seen as the maximum price which increases the surplus gain for farmers to 11.8% and is acceptable t other actors. In the longer term, the processing factory should pursue an increase of the quality of block rubber to the standard of SVR 3L and at the same time, implement a broader marketing strategy to diversify the output markets, so as to increase their sales price of the block rubber. The cooperative trader's network, once attaining the critical mass of raw latex trading, is more likely to accept a lower rate of return per litre liquid latex. By the end, with the expected moves of two actors downstream as discussed, rubber smallholders can sell their produce at a higher price.

## 4.2 Increased competitiveness of the value chain

As the liquid latex collection system operates, all actors will improve their profits and reduce losses related to the collection, trading and processing of raw latex, contributing to increased productivity and the improved competitive position of the entire value chain. The competitiveness of the value chain will surpass other old and stagnating rubber clusters owned by SOEs located in the same province and neighbouring provinces. Increased competitiveness can be measured by higher quantity and value of block rubber sold by the processing factory, higher volume of liquid latex collected in the entire system, by the proportion of liquid latex vs. condensed latex collected, productivity of tapping workers. The competitiveness of the value chain also assures its future development. By the cooperation of large numbers of rubber smallholders into a joint collection project, it overcomes the weakness of small-scale rubber plantations and establishes a **network infrastructure for pro-poor growth** of the value chain, since the young rubber area will turn more and more to the yielding stage over the next 20 years. This initiative to set up a liquid latex collection system will be the bases to be considerd by other initiatives on maintenance, renewal and exploitation of small holder rubber plantations.

## 4.3 Fostering commercially-viable linkages within the value chain

One indication of a competitive value chain is the visibility of linkages amongst its actors and between value chain actors with supporting institutions and embedded service providers. There has been numerous evidence of weak linkages amongst Vietnamese firms that make them disadvantaged in global competition, notably in important export industries such as wooden furniture and cat fish. In these sub-sectors, weak or even no linkages exist between producers and export firms which could provide producers big contracts from overseas importers. Since Vietnam is now the fourth largest rubber exporter in the world, the issue of linkages amongst actors in a local rubber value chain, with big rubber manufacturing firms like GERUCO, DRC, etc. is indispensible to increase value added of rubber producers of Vietnam. The aims are to reduce the volume of raw rubber exported and at the same time increase volume and quality of Vietnamese rubber products to the global market. Vertical linkages along the value chain can have a domino effects on rubber farmers and middleman because they channel the market information flow backwards to the actors upstream and force them to react promptly to market demand. Horizontal linkages amongst rubber farmers are critical to the processing firms and manufacturers of rubber products to achieve their supply chain policies with mass outgrowers. More important on the side of smallholders is to

get out of isolated production perspective and to achieve a stronger negotiation power versus other actors in pursuing common goals and a common strategy of their network.

With the set up of the liquid latex collection system, both vertical and horizontal linkages as discussed can be activated and become more commercially viable. As these linkages get stronger and the degree of trust in the partnership is enhanced, engaged partners can benefit from higher surplus income thanks to higher volume of liquid latex be accredited and channelled to the system. In further steps, the processing factory can enjoy the economics of scale with the liquid latex production line that enables them to reduce production cost per unit, thus offering higher price for their input suppliers (or realizing even more attractive margins). The twofold advantages of these linkages to the actors, on volume and price, make the partnership even mire commercially viable. The leverage resulting from this partnership is the continued dynamics of individual actors and of the entire value chain to explore the bright prospects of the local rubber sub-sector.

## 4.4 Environmental advantages of the liquid latex collection system

The traders and the processing factory are very concerned about the environmental pollution associated with the collection and processing of condensed latex. 3 traders have reflected that their neighbours do not stop complaining about the stinking smell and waste of condensed latex from the store house of the traders. Village boards have given instruction for these traders to construct underground ditches for wastes of condensed latex. Still, smell pollution persists even at la large distance for each collection point, carried forward by strong winds from the hills. The air pollution is not really better at the processing factory, where all condensed latex is primarily processed in a large cement basin with chemicals. Apart from the bad smell that could adversely affect workers' performance, waste from condensed latex is huge in volume, as a result of in the low ratio of input material to final produce (10 : 6), which requires much higher investment of the factory for a waste treatment system. This disturbing environmental picture will be controlled to a large extent with the introduction of the liquid latex collection and processing. Since raw latex in liquid form is not transformed with chemical substances to other forms but run all the way to the processing of block rubber, no waste is incurred with this new system. Also, the short time duration obligatorily for the processing of liquid latex means shorter time for handling the raw latex amongst actors' places, thus lower the environmental effects to adjacent areas.

**Figure 6: Map of Binh province, Vietnam**

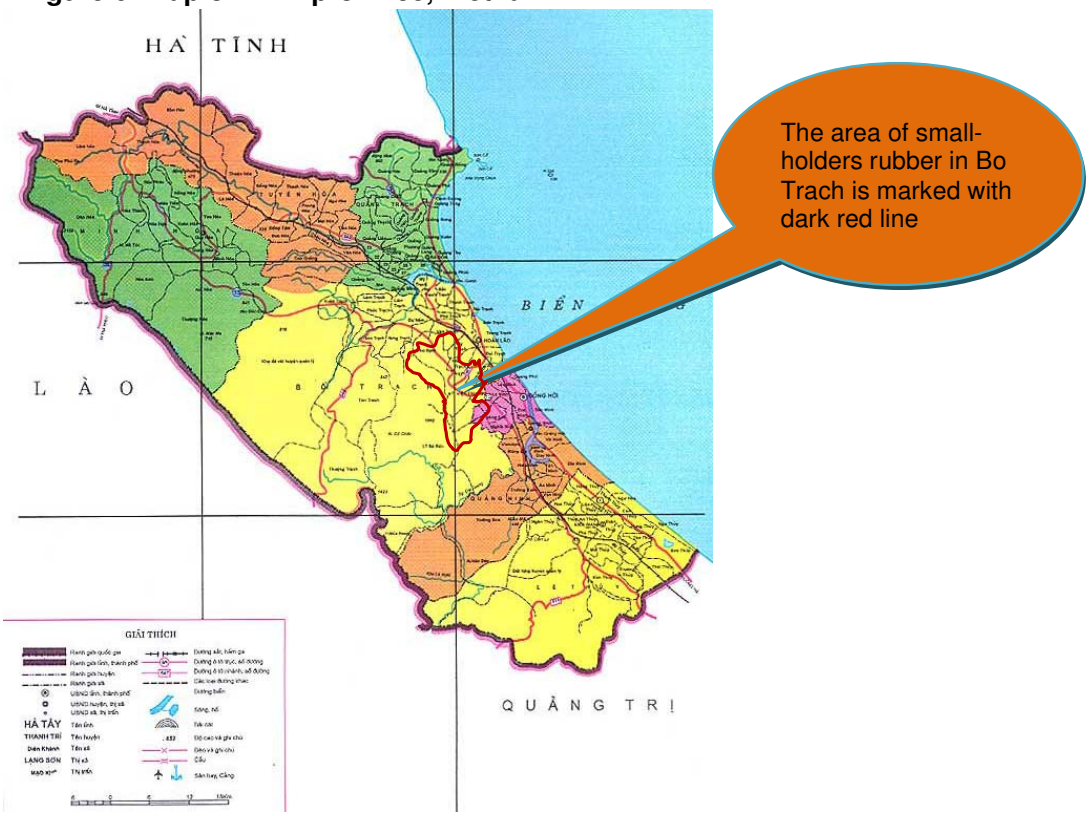



**Figure 7: Map of the rubber cluster in Bo Trach**

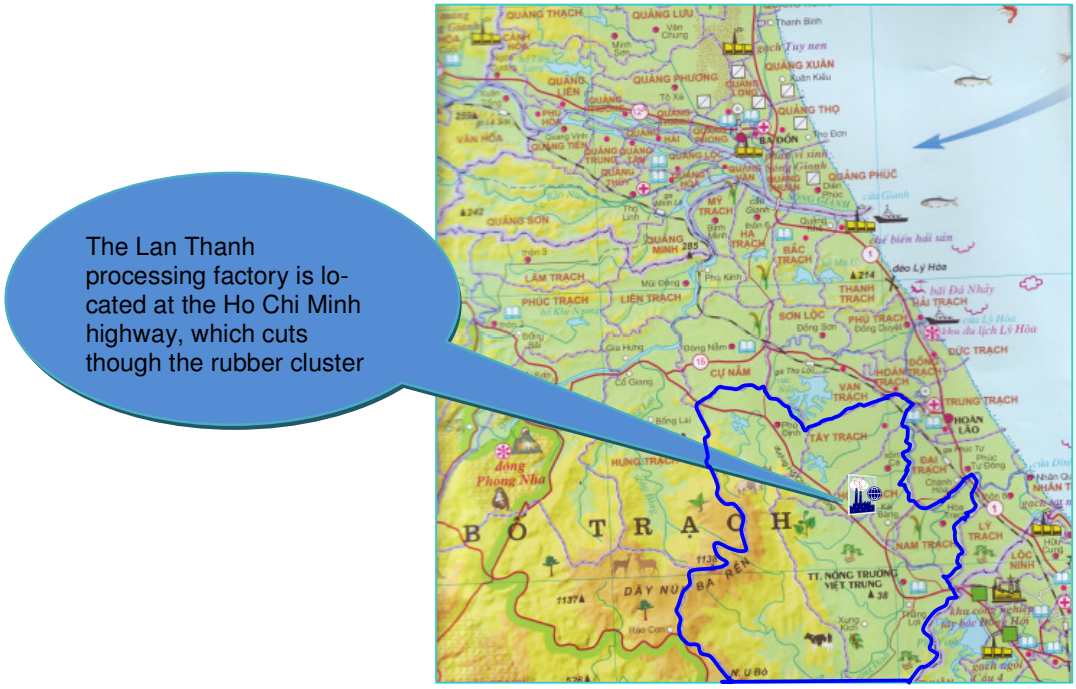
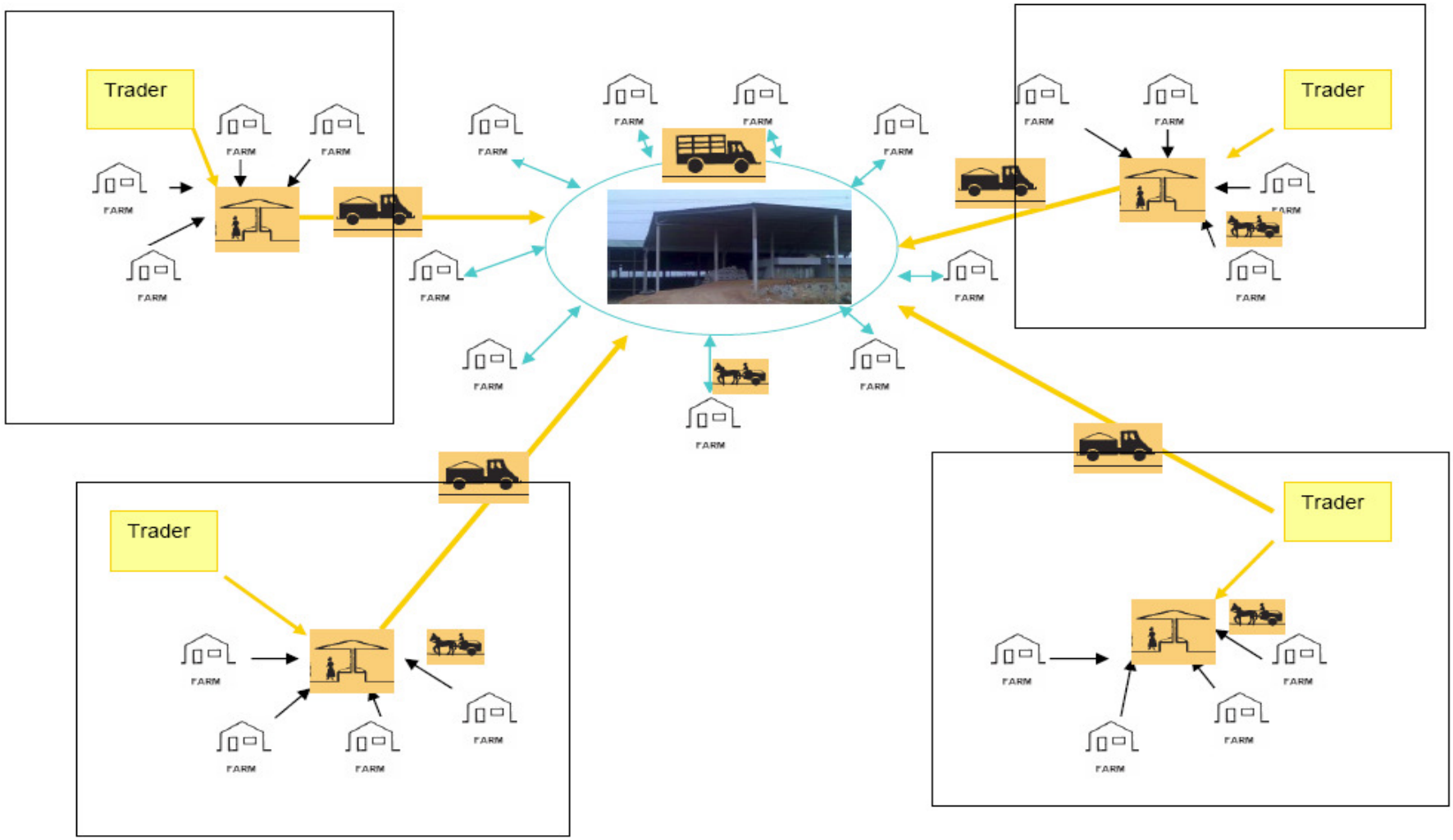


**Figure 8 Liquid latex collection system**




*(source: Sigrid Giencke,2008)*

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