



Asia-Pacific  
Economic Cooperation

**International Seminar on  
“Environmental Management for APEC Micro  
Enterprises:  
*Toward Sustainable Development*”**

**17 June 2005  
Royal River Hotel, Bangkok, Thailand**

**APEC Small & Medium Enterprises Working Group**

**2005**

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# **International Seminar on “Environmental Management for APEC**

## **Micro Enterprises:**

### **Toward Sustainable Development”**

**17<sup>th</sup> June, 2005**

**Phanurangsri Room, Royal River Hotel**

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#### **1. Background**

Small and Medium Enterprises (SMEs) are the economic backbone of many developing countries especially countries in Asia and the Pacific Rim Region. In Thailand, there are many programmes aimed at enhancing knowledge and capabilities of SMEs in order to increase their production. One of the most successful of these programmes is “One Tambon One Product”, or OTOP, launched by the government to promote handicraft industries and micro-enterprises in Thailand. This programme has become so successful that its products are in great demand both in the domestic and international markets. However, the rapid expansion of these enterprises has also brought drastic changes in their production processes. Previously, local practices were based on natural inputs and environmentally friendly production processes. Unfortunately, in order to meet the targeted demand, several communities have had to adopt chemicals to replace natural inputs. Large volumes of wastewater and solid wastes have been released into public sphere without any proper treatment. Consequently, natural resources and the environment have been exploited and there has been severe environmental deterioration in many local areas. This has prompted the concerned governmental agencies to find ways to cope with pollution problems from the SMEs expansion.

During 2003-2004, the Office of Small and Medium-Scale Enterprises Promotion (under the Ministry of Industry) commissioned the Good Governance for Social Development and Environment Institute (GSEI) to conduct seminal research on environmental management in the SME sector. Six brainstorming seminars at the provincial level were held to consider the appropriate practices and how to achieve them in order that SMEs can grow in an environmentally friendly fashion. Equally important is how to bring about sustainable development of SMEs. This requires well-balanced economic, social and environmental dimensions in development.

In the case of Thailand, Sufficiency Economy, bestowed by the King of Thailand which encourages businesses has been proposed to be modestly and reasonably conducted according to ethical and self-sufficiency principles. Businesses following this middle path could benefit from reduced risks in their transactions. The use of appropriate technologies, local know-how and materials as well as the saving of natural resources may prevent businesses from being affected by the impact of trade and environmental conflict.

In the context of Thailand, Sufficiency Economy is in line with sustainable development. For case studies, in the case of Thailand is selected Mulberry paper production in Chiang Mai Province is one of the most rapidly growing SME businesses in which the environmental issue has become of great concern. It was therefore selected as a case study to be presented at the APEC-SME meeting in Chile in October 2004. In light of that meeting, it appeared that several APEC economies shared similar problems and realized the need to achieve sustainable development of SMEs. Consequently, the Office of Small and Medium-Scale Enterprises Promotion has assigned GSEI to host an international seminar aimed at exchanging ideas and experiences on sustainable development of SMEs among APEC members.

## **2. Objectives of the seminar**

- 1) To serve as a forum for a number of APEC members to exchange ideas and experiences on how to achieve sustainable development of SME businesses with an emphasis on handicraft industries and micro-enterprises such as mulberry paper or batik production;
- 2) To provide the participants with an opportunity to exchange views with Professor Yunus, the founder of Grameen Bank who is world renown in micro-credit systems;
- 3) To present successful cases which the local community of Chiang Mai Province can learn and apply.

## **3. Procedure Conclusion**

Good Governance for Social Development and Environment Institute (GSEI) and Office of Small and Medium Enterprises Promotion (OSMEP) organized an International Seminar on “Environmental Management for APEC Micro Enterprises: Toward Sustainable Development” in order to brainstorm and exchange the experiences among government, business, NGOs and

foreign organizations for development on SMEs. The purpose was to enhance business activity together with environment management under the principle of sustainable development. This seminar was attended by 95 participants comprising;

- 3.1 2 Keynote Speakers: Professor Muhammad Yunus, Managing Director, Grameen Bank, Dhaka, Bangladesh; and Professor Dr. Apichai Puntasen, Director of Rural and Social Management Institute (RASMI), Thailand.
- 3.2 12 Representatives from APEC members and 1 representative from Non-APEC (India)
- 3.3 70 Representatives from Thailand and foreign countries comprising public and private sectors, as well as NGOs
- 3.4 10 Representatives from Mulberry Paper Industry at Ban Ton Pao, San Kamphang, Chiang Mai

#### **4. Meeting Conclusions**

##### **Morning Session**

**Speakers :** Professor Muhammad Yunus, Managing Director, Grameen Bank, Dhaka, Bangladesh; Professor Dr. Apichai Puntasen; and Mr. Hideaki Shimizu, International Business Advisor, Organization for Small & Medium Enterprises (SMRJ) Japan.

**Moderator :** Dr. Wichai Turongpand , National Institute of Development Administration (NIDA)

##### **Professor Muhammad Yunus**

Professor Muhammad Yunus elaborated on the experiences in environmental development. He cited the implementation of his approach by establishing the bank for loan and financial services provided to the poor people in Bangladesh such as the Grameen Bank. The reason why he raised this experience was that a high proportion of the poor were able to repay their loans. Therefore, this idea was seen as helpful in enhancing the social status and improving the environment for the poor. The initiative emphasized on creating jobs and income for the poor, thus generating employment, more investment and equal social opportunity, such as the academic field. In addition, the environmental rehabilitation programme, such as plantation, can have a direct impact on the livelihood of the people.

### **Professor Dr. Apichai Puntasen**

Professor Dr. Apichai Puntasen explained the idea of “Sufficiency Economy”, which has been applied by His Majesty the King of Thailand. It is a philosophy that stresses the middle path as an overriding principle for appropriate conduct by the populace at all levels. The philosophy comprise moderation, reason, and the need of self-immunity for sufficient protection from the impact that may arise from internal and external changes. SMEs can apply this philosophy to their production as follows;

- 1) use appropriate technology;
- 2) use all raw materials and resources at their full utilization ;
- 3) not to use technology as a substitute for human employment except to avoid possible damage to product quality;
- 4) Organize the production scale to be consistent with management ability;
- 5) Not to focus on short-term profit;
- 6) Emphasize honesty by not taking advantage of consumers, workers and suppliers of raw materials;
- 7) Avoid market risk by diversifying products or changing to new products in response to changes in market demand;
- 8) Low risk management by using internal sources of funding; and
- 9) Use local materials and supply local markets as much as possible and then gradually expand to local, national and foreign markets accordingly.

Moreover, there were additional rules for Sustainability as follows;

- 1) Human capital: to empower everyone to do as much work at the same time, and to improve workers’ skill;
- 2) Social capital;
- 3) Environmental capital: to utilize internal natural resources instead of importing raw materials;
- 4) Physical capital.

He also indicated that the rules of sufficiency plus the test for sustainability indicate that social and environmental concern as well as the sustainability of business and society to be more explicit than the concept of good corporate governance.

**Mr. Hideaki Shimizu**

Mr. Hideaki Shimizu concluded the case study of the Mulberry Paper Industry at Japan, which was one of the successful SMEs. As experienced in Thailand, Mulberry Paper Industry at Japan, both manual and automatic, caused water pollution as well as odor. However, Japan has controlled waste water for more than 40 years, through standardization of national and local law. Problems of small producers were attributed to the lack of knowledge, management and waste water treatment cost. The government tried to solve these problems by consulting and teaching such as the promotion of developing new technologies, promotion of plant relocation, and tax incentives. As a consequence of these policies, over 80% of small producers were able to set up their own waste water treatment themselves. All producers should establish such treatment in factories under the management of government authority.

**Afternoon Session****Environments Session**

**Speakers :** Associated Professor Khajornsak Sapajaree, Engineering Chiang Mai University, Thailand; Dr. Soo - Tae Choo Team Leader Plant Engineering Center, Institute for Advanced Engineering, (IAE) Korea; Dr. Rakmi Abd. Rahman Professor of Department of Chemical and Process Engineering, University Kebangsaan, Malaysia; and Mr. Qiu Jin, Department of Human Resources and Institutional Affairs SEPA, China

**Chair: Dr. Chaiyod Bunyakidj,** Vice President of Thailand Environment Institute (TEI), Thailand

From the environmental aspect for SMEs, the following are summaries by representatives from each country.

Associated Professor Khajornsak Sapajaree, Thai representative, presented a case study of the Mulberry Paper Industry at Ban Ton Pao, Chiang Mai. This Mulberry Paper Industry had an impact on the environment, particular wastewater problem. The usual way to solve such problems involved local collaboration and production improvement by using Clean Technology.

Dr. Soo Tae Choo, Korean representative, presented the application of Clean Production to Plating Process by Spot Inspection and Usage of Alternative Chemicals. Clean Production in

Korea stem from Korea National Clean Production Center (KNCPC). Its technical idea is applied to Plating Process I to dissolve and eliminate interferences or impurities from water.

Dr. Rakmi Abdul-Rahman, Malaysian representative, presented the Greening of Batik and Tanning Industries. She indicated that state production affected not only the environment, such as wastewater, but also people's health, such as cancer. To solve these problems, Clean Production and water treatment should be utilized.

Mr. Qiu Jin, Chinese representative, presented the SMEs in China which is developing its industries. The Government has concentrated on Clean Production by combining with science process to support SMEs production. Moreover, law for controlling and supporting the use of Clean Production in SMEs was established, therefore improving the exporting SMEs and reducing environment problems caused to the country.

From all previous views, it can be summarised that the important approach used by each country for environment management as protection against environment pollution is Clean Technology. Furthermore, SMEs cause environment problems such as air pollution; wastewater which means respective governments should help and support SMEs to handle such problems.

### **Economic and Social Session**

Speakers : **Dr. Udomsak Seenprachawong**, National Institute of Development Administration (NIDA); **Dr. Soparatana Jarusombat**, Thammasat University. **Thailand**; **Mr. Quach Huy Thong**, Project Manager, Hoalac Project Management Unit, Vietnam National University, Hanoi, **Vietnam**; **Mr. Abraham Varampath**, Regional Manager (South), Network for Preventive Environmental Management, **India**; **Dr. Ren – Yow Huang**, Director of the Division of Management Consulting, Small and Medium Enterprise Administration, Ministry of Economic Affairs, **Chinese Taipei**.

Chair: Dr. Wichai Turongpand, National Institute of Development Administration (NIDA)

From the meeting on Economic and Social aspect for SMEs, the following are summaries by representatives from each country.

Dr. Udomsak Seenprachawong and Dr. Soparatana Jarusombat, Thai representatives, studied the economic and social aspects of Ban Ton Pao, Chiang Mai through area survey, meeting and brainstorming. The economic suggestion for Ton Pao was that there should be emphasis on the principle of balance between paper-making process and environment management. Additionally, the strategy to support producers to protect the environment was proposed such as certifying such producers with green label. For social aspect, the paper-making process at Ban Pao affected not only producers themselves and the community, but also neighborhood community. Therefore, community social was changed to be city social.

Mr. Quach Huy Thong, Vietnam representative, proposed Clean Technology for reducing environment pollution in his case study of Ceramic Industry. Burning process of ceramic industry at Bat Trang, Vietnam, releases chemical, particular sulfur dioxide, thus causing air pollution. The suggested way to solve this problem was to apply the standard environment management by utilizing high technology and education on environmental protection for community as well as to lead a simple lifestyle without damaging the environment.

Mr. Abraham Warampath, Indian representative, has proposed the use of REACH policy with exported chemical control. Due to the effect of chemicals on health and environment, REACH policy was applied to control export of chemical including downstream and upstream of used chemical in factory. This supports Clean Production process. Nowadays, import and export of products in many countries such as the European Union (EU) are concentrated on the application of friendly environmental process and Clean Technology. However, this policy has affected SMEs using chemicals because they have to handle documents pertaining to chemicals which are determined by various methods. Therefore, the government serves as an important organization to support SMEs to proceed with REACH policy.

Dr. Ren - Yow Huang, Taiwanese representative, has presented the experience of sustainable environment management in the local Taiwan industry. Although SMEs in Taiwan are very important with proportion of 97.83%, they caused more environment problems. Many ways used to solve such problems include waste reduction by using new process system or new

packaging decoration, and recycle or value added etc. Furthermore, Taiwan supports environment management in community by providing environment education, recycling and establishing conservation areas for natives etc.

From the above presentations on economic and social aspects, there are 6 factors that we should focus on to support the community as follows;

- a. social welfare and medical care
- b. community security
- c. environmental protection and ecology
- d. environmental scenery and tourism
- e. education of humanities
- f. local industry development

For the question and discussion sessions, representatives from Ban Ton Pao, Chiang Mai, and Sri Boon Ruan, Nan, sought questions on environment management for the Mulberry Paper Industry in aspects of technical and “Sufficient Economy” to support sustainable development for SMEs.

### **Proposals to APEC members Meeting from Overall Conclusions**

First, is the ‘networking’ to improve the understanding and the concerns of environmental sustainability.

Second, in the case of Thailand, the Office of Small and Medium Enterprises Promotion should take the lead in setting up a forum for the exchange of ideas and organize activities relating to environmental management for SMEs.

Third, is to include environmental management for SMEs as an important agenda in all APEC meetings such as the ministerial meeting in Korea.

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**Professor Muhammad Yunus:**

Good morning. Ladies and gentlemen and my friend, Apichai, Excellencies, istinguished participants. It is a pleasure for me to be here this morning. I am particularly delighted to meet my long lost friend, Apichai Puntasen. We were together in Vanderbilt. I was there during the first half of 1960’s. Apichai came later as a student. In 1972, I left Vanderbilt to teach at Tennessee State University. Somehow we lost contact with each other when he left for Australia. Therefore, it is a very special occasion for me to be with Apichai today.

After a long struggle Bangladesh became independent in 1971. I decided that I should come back home to teach at the university. This is where I like to teach most. Here we are talking about the environment. There are two kinds of people who are a threat to the environment: the rich who deteriorate the environment by their wastefulness and inconsiderate consumption, and the poor who deteriorate the environment out of necessity for their survival. It seems so desperate. The poor live day by day and cannot care less for what will happen tomorrow. For their survival, ‘today’ is the most important thing, whereas ‘tomorrow’ is too far away for them. Therefore, they keep on doing things out of their survival needs in the way that may be harmful to the planet.

I would like to mention the Dhaka University Campus, which gives a much clearer picture of the environmental issue. When I first arrived in the 70’s, it was still a new campus of about 6 or 7 years old. It was a very big and beautiful campus situated in the middle of villages. It was unlike other universities that we all know which are usually built in or around the city. For political consideration, Dhaka University Campus was built away from the city.

At the time when General Ayub was ruling Pakistan under the military dictatorship, he thought students were troublemakers. This is why all universities are situated far from the cities in Pakistan. The ruler thought that the long distance could prevent students from marching to the

city and creating troubles there. Even if they tried to come to the city, by the time they got to the city they would be too exhausted to create any trouble to the government. But I considered myself lucky that my university was far from the city. I was right in the middle of villages. It was literally like an island. We were living among many villages in a very beautiful campus. What we saw there was not taught in our economics department. In the morning there were streams of people going to the campus. They were not only students and teachers but also villagers with cutting knives going up the hill through the campus. In the evening, these villagers went down the hill, through the campus, and quietly regained their villages. The people who were going to the hill were the poor who lived in the local communities. They chopped down trees and took whatever they needed in the forests for their living. As a result, all the hills that you see were abandoned because anything hardly grew there anymore. People were forced to do this for survival.

Actually, they could not care less with the environment because their priority was their survival. Much later, I realized that the same people who destroyed the environment could become the protector of the nature as well. Therefore, we came up with a project and tried to work it out. Hills and forests are government properties in Bangladesh. It seemed very difficult to persuade the Ministry and Department of Forestry to allow anybody else to get in there to do something. Bureaucracy is so difficult. However, through someone in the Department of Forestry, we worked out ways and got some forestlands. The idea was to get them settle there. Instead of having an outsider come in, chop the forest and go home, we were allocated pieces of land for people to live on. We told the poor that this land belonged to them and we would help them to rebuild the forests. They were allowed to take as much as they wanted but at the same time they had to restore the nature. It was a combined joint project between my university and the forest department. It first came out beautifully. The poor became the real protector, the grower and the maintainer of the forests because they felt that these forests belonged to them. However, policy-makers failed to follow up on this project because of other ambitions.

This joint project remained a small experiment where poor people who used to destroy the forests, were now replanting trees out of their own interest. This was possible because it was their land and because it was something they could have a stake in it. So for poor people this was the way. If they were given the ownership or a stake, they could become the protectors. But the real

risk remained the rich and the richest who cannot be persuaded to change their consumption pattern. This is the issue that always comes back again and again.

The other thing that I got involved in around the campus was forced on me. It was the 1974 famine in Bangladesh. To witness famine right next to oneself is not a very pleasant experience. People died of hunger and when someone dies of hunger, he or she does not die suddenly. Dying of hunger is unlike other diseases such as heart attack. Famine injures every minute and every second, bringing death closer to its victim. Famine kills slowly. Hours before or days before death, people suffering from famine already look like dead. Famine brings its victims to one point that the next second they will be dead. All they have are skins and bones and nothing else.

Again, what do all our economic theories tell us? In the situation of famine, what will economists tell the nation and the society about the steps to be taken to help people? Very little. Politicians might think they could have their political solutions and humanitarians might open their kitchens to serve hungry people. How many hungry people can one feed within that kitchen? When we talk about famine, it is not few hundreds or few thousands but hundreds of thousands of people all over. So that quite shocked me and pushed me into a situation where I thought, maybe, I could not solve the problem of Bangladesh but I could at least try to help the people at the next-door villages. It is right there, next to my house. The villages and my house were on the borderline of the campus and that was all.

So I try to get myself involved in the village and that led me to all things I talk about now. The problems of moneylenders and all the sufferings they caused to the poor came very quickly to me. It opened the way for all other undertakings. Why can't this money be provided in an institutional way? Why should it be left in the hands of moneylenders? Moneylenders' conditionality is so extreme. It is unbelievable that these human beings could impose those conditions on other human beings but they do all the time. It's not something that is not known to people. But somehow economists do not know it because there is no mention about moneylenders or loan sharks in economics textbooks. Literature does. Novels and plays tell stories about the role that moneylenders play and the situations they create. Even Shakespeare wrote about a moneylender named Shylock in the Merchant of Venice. The conditionality, according to which "you give a pound of flesh", takes place almost everywhere.

Then the question was ‘Can it be done other ways?’ I tried to persuade banks to lend money to people in the village instead of leaving them at the mercy of the moneylenders. I thought the villagers should be able to go to the bank and borrowed money from them. The bank told us immediately that it was not their job and they could not do that because poor people did not have collateral. I asked who cared whether they had collateral as all the bank needed was to be assured of getting money back. The bank people said the entire banking system was done on the basis of collateral. My argument did not convince the manager of the bank. He suggested that I should see other bank officials of higher hierarchy or those who could make decisions to see if this could be done in compliance with the rules of the bank. So I took this advice and discussed this issue with many officials, especially with those who could make decisions. However, every body gave me the same answer. “No way. Just forget about it”, said all of them. I could not forget it because I see the reality so starkly naked right there in the village where I associate myself.

Then after a series of discussions over months I came up with an idea according to which I would offer myself as a guarantor and I would sign the paper if the bank could lend the money. This time they could not turn down my proposal because I picked it up from their conversations about ‘the rules that existed within the bank’. They wanted to understand more clearly who I was and why I should offer myself as the guarantor and give money to somebody else. To their eyes I was suspicious. I explained them that since their regulations did not cover it someone had to cover it.

I was willing to cover it for them by becoming the guarantor. By so doing, the bank was safe, its money was guaranteed by myself. I said I did not care and I could expose myself. It took about another two months to negotiate all the details. I wrote piles of correspondence explaining the bank why I was doing this and how I would do it. Finally they accepted it. I was very delighted that it happened. I withdrew money from the bank, filled in the forms, signed myself as the guarantor and gave the money to the people in the village. The bank said that I could say good-bye to the money because it would never come back. They thought it was the best advice they could give to me. I said I did not know because I had never done this before. I was still hoping that it might work out. In this desperate situation, what human being could do was to try. That is what I am doing: Try.

Fortunately, it worked and I was very excited and continued to do it. I came back excitedly to report to the manager that I got the money back. However, he remained totally

unimpressed as if nothing happened. He said that I did in one village. “One professor in one village can do all kinds of miracles. But it does not change anything in the world”, said the manager. I then asked him what I should do. He asked me if I could do it with two villages then he could see whether it worked or not. I accepted to do that. I did it with two villages and it worked. But still, he remained unimpressed and told me to carry out my experiment with at least five villages and see if it worked. And I did that. The story went on and on for long. Suddenly I realized that the man had absolutely no intention to change his mind. I asked myself: Who is he to set conditions on me and decide for me?

At the beginning, I had no idea whether my experiment could work. Now I know exactly what happened. If anyone tells me now that poor people are not credit-worthy the way the manager said, I will scream with the top of my voice and tell the world that it is a complete lie. It is not true because they are the ones who are really credit-worthy. Every time I give them a loan, every penny pays back. In contrast, it is the rich in Bangladesh who are not credit-worthy. In Bangladesh, rich people will borrow a large amount of money from big banks and never pay back. It has become a tradition. They build beautiful buildings and buy beautiful cars but never pay back the bank loan. However, somehow they become very prosperous with all money they got from the bank. They are so powerful and no one can even touch them. This situation that happened in the 70’s can still be observed nowadays. Our experiment has contributed in protecting the right of the people to gain access to loans and financial services.

I realized that if I had to continue the route that I first took, our undertaking would never get off the ground. This is due to negative reactions of the banking institution. The bank still felt negative towards what we were doing. So I had an idea to set up a people’s bank. We kick-started our campaign and finally succeeded in getting the bank established.

On top of that, another addition I put in is that the bank for the poor should be owned by the poor. This became a sticking point with the government. When we tried to do two things, we were insisting that:

First, there should be a separate law to create the bank like what we would like to establish. We do not want our bank to be created on the existing banking law because this bank will ultimately become the same old bank with the same old banking law. The new law will enable our bank to sustain itself and further strengthen the features that we have set up.

Second, poor people who are borrowing from this bank should own the bank. It took a long time to get to the second point but finally we made it. Today, the Grameen Bank is owned by the poor and among these poor people who borrow from the bank, most of them are women. At present, we have 4.7 million borrowers and 96% of them are women. Those women not only own the bank but also sit on the board, make policies and decisions.

So what happened to the collateral? Why was it so sacred that one cannot even touch it? I can say that it is like telling people that human beings cannot fly because they do not have wings. It was that kind of argument. This idea was shared among the people who thought it was impossible for human beings to fly. Some people put extra wings on their shoulders and tried to fly but they got injured or even killed in the process. However, it could not stop human beings from attempting to fly and continuing to try. They finally found the way. To say that without collateral, banking cannot be done is more stupid than saying that human beings cannot fly because they do not have wings. Human beings are very creative. If they find a problem, they will use their brains to solve it and finally get the solution. If one feels something very intensely, one will get things done. It is a matter of time and how much energy one puts behind it.

So we did it and realized this was a strange world where all financial institutions were created to serve only the privileged and people who already had enough. People who did not have enough had no place in these institutions at all. Only the people who have collateral are allowed to step in.

This is financial apartheid, similar to racial apartheid in South Africa, which the whole world found repulsive. South Africa finally had to yield to the world's opinion. But financial institutions can get away with whatever they want to do because they are so powerful and have so much money. We do not even see that they are practicing apartheid by rejecting innocent people whose sole mistake is their being poor.

Therefore, we took another step by thinking and saying that the access to credit facilities should be considered as basic human rights. It was not the question whether the bank could do it or not. It has to be resolved within the framework of human rights issue. They have to find the way to deliberate on this because it is important to them. In this material world where money is overpowering, one who has no money is nobody. When financial institutions refuse to do business with someone, he or she will have no chance to generate money. Therefore, the poor are doomed from the beginning. If they don't have their 'first' dollar in their hand, they cannot catch

the next dollar. It is funny but true that empty hands cannot catch anything. So a person who has the first dollar in his or her hand will be able to catch the next and the next. So begins the process. So this is the campaign that we are carrying out. We want to make it become universal, not only for the privileged or a partisan. It is an entitlement for everybody. It has been demonstrated that it can be done. Nobody can say that it is impossible. People always come with the question about whether it can be done. It might be funny that it works in Bangladesh where all kinds of funny things happen. Furthermore, some might think such experiment could not be replicated with success anywhere else. At that time, I could not say much because our experience was limited to Bangladesh. However, one Malaysian professor from Science University of Malaysia was interested in my work. He made the same experiment in Malaysia and it worked beautifully there too.

Now some people might think that our undertaking would work only in Muslim countries because both Bangladesh and Malaysia are Muslim nations. But the fact is that it also works well in non-Muslim countries such as the Philippines. I think that other Asian countries can do it too. It is difficult to change people's mind once people get used to an idea. They become protective of their own ideas and ways of doing things. Thus, when others say something new even if it works in front of their own eyes, they still refuse to accept it. So that goes on and on. Gradually people start to pay serious attention to what we are doing. A lot of people in our country are now convinced that what we are doing is possible. Then we started to look at other countries. More than half of the world population people are not qualified or eligible to borrow from the bank. This is the kind of regulations they have to suffer from. It is like giving a death sentence to more than half of the people who live in the world. Therefore, we quickly started this process so that people could have their own livelihood.

Concerning the issue of poverty eradication, there has been a simple and familiar statement that says 'the only way to solve poverty is to create employment'. The question is how to create employment. In order to create employment, the country needs economic growth and investment. So you go back again to the same old argument. What the rich will do is to increase investment. They will set up industries, build enterprises and hire people so that the poor will have jobs. What about other people who do not have jobs? Of course, they will have to wait until the jobs will have been created. Then we come back to the fact that it is not true. People create their own jobs and do not have to wait for somebody else to create jobs for them. How?

By giving them financial facilities and opening the door for financial services like credit. This will instantaneously help create self-employment. People know what they have to do in their environment because they are familiar with it. We encourage people to think of some ways to use money and start earning money. We provide people with necessary information so that they can have the right understanding. We sit down with the villagers especially women who are our borrowers to discuss their plans and problems they are facing. This work has been going on for months and years. Through a series of long discussions, we have created something out of the people's own thinking which we called 'Sixteen Decisions'. These decisions resulted from their own conversations. No outsider was involved in the decision-making process. We only tried to give our views on the subject without imposing anything on them. These fascinating "Sixteen Decisions" were not made in one day but through a long consultation process from 1979 to 1984.

One of the decisions is that we should grow vegetables all year round, eat plenty of it and then sell the surplus. The context of this decision was that the children were suffering from night blindness in Bangladesh. Night blindness was a common disease in our country at that time. People did not understand why this disease affected the children who could see during the daytime but turned blind after dark. The disease can lead to permanent blindness. The cause of the disease is vitamin A deficiency. The cure is very simple. All they needed to do was to eat vegetables, particularly colored vegetables. We discussed the problem and the solution with the people, who came up with the decision to grow vegetables. The discussion on the subject became a very popular topic of conversation in our country because everybody's child was threatened. The problem of night blindness disease was over, thanks to the decision.

Today, the night blindness is history in Bangladesh. The disease practically does not exist anymore. In the meantime, Grameen Bank became a seed-selling company. This is due to the fact that there were no seeds available for the poor to grow vegetables. We then took the responsibility to provide them with the raw material. This is one of our efforts that we made for ourselves. Housing was another issue. Poor people live in houses made of plain simple jute sticks. They just put them together side by side. That's all. These sticks give an image of a house, but do not create the house. Everyone can see what is going on inside, with all the winds going back and forth. In a monsoon country like Bangladesh, you can imagine what happens to the house with the jute sticks on the top and on the sides during the raining season. One of our efforts is to address this problem. We have introduced housing loans. Everybody says this is a failure.

One can give a loan for a cow. People can milk it and pay the loan back. But a house does not give milk. How can people pay back? We gave housing loans based on our assessment. Our long-term housing loans with installments were very popular and became an instantaneous success.

Another problem we faced was about the personal habits of the poor people in most of the villages. The poor do not use latrine. There is no latrine for them. They just go out in open and spread out diseases everywhere because it's all over the place. So we discussed in our workshops what could be done. Someone suggested that we should dig a hole and use it as a pit latrine. The idea served as a starting point of our further efforts to build sanitary latrines in the villages. It also became one of the 16 decisions. Grameen Bank gives loans for sanitary latrines. Why did we build pit latrines? Because they do not cost any money. In the process, people are creating a healthier living environment for themselves, enhancing better health, protecting the children from night blindness, etc. So we try to support our undertakings by publicizing what the decisions are and how to maintain and implement them. The borrowers as well as community centers are also competing to implement decisions and take pride in doing so. Every year people are comparing with each other to see how many of those 16 decisions have been implemented and how successfully these decisions have been carried out.

One of the sixteen decisions is that all illiterate families in the villages should send our children to school and make sure that they stay in the school. This decision helps the children go to school and continue their education at higher levels. Many of them are now in the universities, attending medical and engineering schools. It is fascinating to see illiterate families that have never had a chance to send their children to school and suddenly had a girl who just became a doctor. The whole village takes great pride in their doctor because she is the first doctor they have ever had. And she happens to come from a very poor family in the village. So this is the tremendous pride. Somebody's son or daughter has become a university lecturer. It is an excitement for the whole village that someone who has no formal education has now a son or a daughter who is teaching in a university. This pride keeps propelling the people to move on so that they can change their life. Our intention is to see a new generation of people who will be absolutely and dramatically different from the generation before. In our effort, we also try to introduce the information technology because we think this is an important aspect. We put a special emphasis on two things: (1) to open the door of financial services, and (2) to bring information technology to the poor in the way that they can use this technology.

There were 140 million people in Bangladesh who never had a telephone. Our idea is to bring the telephone to the villages. We discussed the idea and thought that Grameen bank could give a loan to its borrowers. They can use the money to buy a cell phone and earn money from the phone. Anybody who needs to make a call can come to them and use their cell phone as if it was a public telephone. Everybody laughed at us, said we were crazy. Nobody believed that this idea would work. We started our undertaking in 1996, and it became a roaring success right away. Everybody wanted a phone. Today, Bangladesh's telephone industry is completely different from the past. Our Grameen mobile phone company is the largest telephone operator. There are currently 3 other companies in the business and they are doing very successfully. Our strategy is simple. We insisted that the borrowers buy a phone with the bank's money and earn money by selling the phone service. The telephone business became very popular and very successful for individual borrowers. Now it seems that to be able to get out of poverty in Bangladesh, one has to have a mobile phone. There are more than 100,000 telephone ladies all over Bangladesh. I once asked one of the telephone ladies about feeling after being successful in the business. She said she made a lot of money and was very proud of herself. "What I feel very proud of is that no wedding in the village takes place without me getting invited. This is because I am such an important person for the villagers. Everybody has to come to me to make use of the phone. So it is very important that the telephone lady must attend the wedding." The lady was nobody before. Besides, she is an illiterate person. The telephone business has changed her life. So these telephones can be used for health purposes, for emergency, for business, for anything and have become very popular. The year 2005, alone, counts about 200,000 telephone ladies.

Another problem is electricity supply. 70% of the people of Bangladesh do not have electricity. You have just had a brief electricity failure here. Blackout is very common in Bangladesh. People were having a big meeting and the electricity suddenly went off, and did not come back for hours. Nobody knew when it was going to come back. The further away you go out from the capital city where all the important people live, the worse it gets. After all, who cares for the countryside? Most of the villages do not have electricity. How can people use the mobile phones in the villages where there is no electricity? They need electricity to charge your batteries. This was our initial problem. We came up with a quick solution, solar power. We created Grameen Solar Company. All people need to do is just attach a little solar panel to the

cell phone. Bangladesh has plenty of sunshine, like Thailand does. We realized that solar power was useful not only for telephones but also for many other purposes. Therefore, we created solar home systems, solar business systems. Our Grameen energy company became a very successful business. We now sell over 1,400 solar home systems per month. There are currently over 40,000 solar home systems in Bangladesh. Here is a case of renewal energy. And this is where the environmental issue comes in. People should gain access to appropriate technology in order to do the right kind of business. They can expand it as far as they can. Today we could challenge the entire electricity system in Bangladesh, only if the solar panel cost was half the price of what we have to pay at present. Now that they have to buy it at full cost, it is neither a charity, nor a subsidy program. We have to charge the whole price of everything, which means less number of people can afford to do that. We made it easy by providing necessary credits to them, so that they can buy it in installments and pay in tiny, tiny, little installments. Even then, it is difficult. But if the price of solar panel could be less and the production cost of solar energy per watt could be brought down brought down due to the concentration of research on the improvement of the technology, we could easily beat that fossil fuel electricity at anytime. So this is where we get stuck. For the time being, we are running it as a business, and not as an NGO charity program or a government subsidized program. We saw a lot of ponds in Bangladesh, which are getting silted and unused. This is one of the same old problems we are facing every time. Lots of people are jobless in Bangladesh. At the same time there are lots of works waiting to be done. It's a very funny situation. There are people sitting around and doing nothing. There are works to be done but nothing gets done. How to get these two extremes connected and create mutual benefits? The pond issue came very vividly to our mind. These ponds were constructed by ancient Kings a thousand years ago. The purpose of the construction was to create water reservoir for the royal cattle. Thousands of huge and beautiful ponds were ordered to be dug. Gradually they silted up. Some has become so shallow that one can walk over it. One of the projects we got involved with was the cleaning up of the silt. We organized the poor people around the pond and encouraged their partnership and participation in the project. After the cleaning operation, we started to grow fish. Grameen Fisheries Company was set up to invest in the project. Whenever fish is caught and sold, one half goes to the poor as their part, the other half comes to the Grameen Company to cover the expenses that have incurred. It is a win-win situation for both sides. There is food, there is fish. Bangladeshis love fish. An old saying goes that if you scratch a Bangladeshi, all you get

is rice and fish. So here is the fish. Initially we tried to feed fish. Then somebody said it was too expensive to feed fish, and what we should do was to leave it to the nature. We might have less fish but it would cost less. Somebody came up with the idea of bio digester, that we should build a bio digester next to the pond. What goes into the pond can be used as the feed for the fish. Besides, the emitted gas from the bio digester provides both the light and cooking gas for the household. That clicked. We started building up bio digesters around the fish ponds and got the best possible feed for our fish at no cost. Grameen bank also gave loans to the poor people to buy cattle. Again it is a win-win situation for the poor and the company. This year we want to expand our business by marketing 100,000 bio digesters in the whole country. We also decided to plant trees around the ponds to create green areas which would be taken care of by the poor themselves.

I would like to go back to what I have mentioned in the beginning. I said that the poor were a threat. They were a threat because of our own stupidity. They were a threat precisely because we failed to connect their needs for survival and their ability to protect the environment. In order to address this problem, we should be able to make sure that the environment is serving their interests and they serve the interest of the environment. It's a matter of designing a model that works both ways. If we just keep on saying: "Do not do this, do not do that", who will listen to us? People's survival is the most important thing. Coming from Bangladesh, a country which is utterly threatened by the environmental hazards and environmental degradation, I know what I am talking about. Scientists discuss the problems of global warming. For many it is an academic interest. For the people in Bangladesh, it is a life and death issue. If the seawater level goes up by a few inches, our country will disappear under the water. In 1992, Bangladesh was hit by a tidal wave that killed 38,000 people in a night. Who were the victims of this tidal wave? They were absolutely the poorest people who were living at the very edge of the existence where the sea and the fresh water meet. These are marginal places where nobody else would dare to go. Therefore, they were the first to be threatened by every natural disaster and every climate change. So to us, it is a very important issue. I do hope that what we will be discussing here will make an impact on the policy makers and also in terms of the way we will create things in the future. We want to persuade people by doing rather than by preaching. In order to succeed, our undertaking must not only, make sense to the people, but also serve their interests. The story of Grameen Bank has demonstrated how a people organization is able to help alleviate the poverty of hundreds of

thousands of people and, at the same time, contribute to the building of a society in a sustainable way.

I will stop here. Thank you very much for your attention.

**Dr. Wichai Turongpand (Moderator):**

Thank you very much Professor Yunus for your keynote speech. Actually we have about 15 to 20 minutes for the questions. I will try to start so that the floor can get some more questions. It seems to me that there have been 4 steps in the development of Grameen bank. The first step is marked by your clear intention to help the poor. This motivation is very important from the starting point. The second step started when you were trying to work without collateral. The third step began as the organization was gradually transforming itself into a financial institution for and by the poor. Then came the fourth step when Grameen bank branched out into other associated companies that really help improve the living standard of the people in the villages. These four steps are very complex and very difficult. My questions to you, Professor Yunus, are:

What is the most critical point that any government should concern about when it comes to the use of micro credit as a source for development? When we talk about development, it is related to the poor. Where should be the starting point?

**Professor Muhammad Yunus:**

First, I usually tell people that governments should stay away from micro credits or micro credit enterprises. Do not get involved in delivering the credit, particularly micro credit. Governments create a bad chemistry. Whenever the government steps in, trying to deal with micro credits, it becomes a political issue. When politics gets involved with it, the sound financial policy becomes very difficult. It becomes more a question of getting elected and getting their votes out rather than getting the money back. This is something we keep saying. Governments must make it very clear to themselves that they are not here to deliver credits. However, governments have a very important role to play. That is to create the right environment so that others can come in and do the job properly. The private sector can do the job. What we need is policy support. It is true for Bangladesh. And it is also true for other countries. I have mentioned

about creating a separate banking law to create micro credit banks like we did for Grameen Bank. A separate law, that's how we came to be. There are many NGOs in Bangladesh who runs micro credit programs. Some people say that this is not a very healthy thing because NGOs do not have any formal permission to deal with micro credits. From the legal point of view it is illegal for NGOs to lend money. But the government tolerates that. I think if we can turn those NGOs into micro credit banks, it will enable the NGOs to better mobilize financial resources, take deposits and run their operations in a way that can be self-sustained. This is possible only if a separate law on micro credit banks is enacted. I have also talked about how difficult it is to get a banking license. It requires a huge amount of equity, enormous preparation works and so on. We are not talking about that kind of banks. Micro credit institutions are small banks. We are talking about a single branch bank, a single village bank or a couple of village banks, where poor people can borrow money from. The smaller a bank is, the smaller fees people have to pay. We try to get small people in the business, rather than involving them into the whole hassle of conventional banking systems. And at the same time, what we have to do is to create a micro credit regulatory authority. Either the central bank can do it or an independent body can do it. I am more in favor of creating an independent regulatory body for micro credit institutions because central banks are generally not familiar with this new type of banking. In Bangladesh, we are enacting the laws on micro credit institutions and creating a micro credit regulatory authority and micro credit banks. I think this is what the government can do right away.

Second, the government can establish a wholesale bank and wholesale funds to financially support those organizations and NGOs that are involved in micro finance until the micro credit banks will have been created. The government does not have to own these wholesale funds but it can put in place the legal environment so that the wholesale funds can be set up.

**Mr. Kitimongkol from the faculty of Social Administration, Thammasat University :**

I would like to ask Professor Yunus 2 questions. First of all, it seems to me that Grameen Bank which has millions of customers is operating without collateral. How does the system work? What will happen when poor people cannot pay back and there are non-performing loans? Second, what we hear from you is very, very exciting. Yet I still have some doubts. Grameen Bank is not operating in vacuum. For instance, you have set up a number of successful associated

companies, like Grameen telephone company that operates with profits. How is it possible that other private companies in Bangladesh did not see this kind of opportunities? Do other private companies step in as well? Do you have any competition in dealing with them? What is your strategy to enable the poor to run the business against the rich?

**Professor Muhammad Yunus:**

Yes, Grameen Bank operates without collateral. This is the number 1 feature of our Bank. It does not need any collateral. Besides, it does not have any legal instrument between the borrower and the lender. When you lend money, for your legal protection you want to have different kinds of papers signed by both parties. Grameen Bank does not have any of such thing. We think it is meaningless to go through these exercises and waste paper for nothing. This is because we never intend to take anybody to the court of justice for any dispute settlement. How does it work? Trust. Grameen is trust-based. It's a mutual trust, and at the same time mutual interest. Mutual trust is enhanced by mutual interest. We encourage people to form a group of five persons. Several groups of five persons create what we call a center. Our loans are paid back little by little in weekly installments. It has a very good psychological effect. When customers pay a tiny amount, they always feel that they are getting closer to the day when all their debts are repaid. So they continue to do that and save a tiny bit in their savings account. But why do they payback? First, the money that our customers borrowed from the bank generates income for them. Therefore, it is easy for them to pay back. Second, each customer belongs to a group. If he or she does not pay back, he or she will be considered as a troublemaker by the peers. I think nobody wants to be called a troublemaker. Everybody wants to be a good friend of everybody else. It is a matter of pride. Third, nobody wants to be associated with failure, or identified as a defaulter, or a person who is not following the rules. It is true that there are selfish people who only think of their own advantage and cannot care less of what other people say. Fourth, it is very difficult for the poor to have access to financial facilities. That is what I am trying to explain when I am telling the story of moneylenders with their terrible conditions. Grameen Bank has opened the door for the poor. If they do not respect the rule and behave like a troublemaker, the bank's door will get closed down on them. They refuse to pay back and the door gets closed. This is probably the ultimate reason why our customers continue to pay back. And you asked how we managed to keep millions of customers paying back their debts. Our answer is very simple. If it

works with one person, it will work just the same with hundreds of thousands of people. Grameen bank has currently over 1,500 branches. Each branch has about 4,000 borrowers. If a branch is profitable, has an excellent repayment record, and is operating with its own money, you get it done. If you can properly run one branch, you certainly go to get the second one exactly the same way. If there is one person responsible for this branch as a branch manager and he is responsible for his staff and the performance of the branch, you will have another person and his staff to do the same. It is a replication of the same thing over and over again. This is what we do.

For our customers, the bank has become a part of their family. Their children can go to school thanks to the bank. They have their saving and pension schemes as well as their insurance with the bank. They know that if they stop paying back their debts, they will be deprived of these services. We try to keep the bank's regulations as simple and flexible as possible. Even though the customers are in difficulty, the rules will still allow them to cut down their payment and enable them to move on. Our system was created in a way that it does not depend on anything. Initially we had no idea that we would diversify our business and branch out into associated or sister companies. It is important to note that these sister companies are not owned by Grameen bank. Our bank does not invest in them. All these associated companies are independent. In other words, they are stand-alone companies. So whether they do good business or fail, they will not affect the banks' financial situation. Earlier I was explaining about Grameen cell phones. Even if these phones did not exist, Grameen Bank would still be a successful bank. There is no doubt about that. If, for some reasons, suddenly Grameen phone company collapsed, would Grameen Bank still survive? Yes, of course. It will not hurt the bank. The sister company has added value to the organization through its information technology. We do not operate in vacuum and have to take both the negative and the positive sides of the modern world. We build ourselves in a way that no matter what happens, if the whole world goes negative, we still survive. This is how we try to do. We will survive.

**From Department of Science:**

First, I would like to thank you for such an inspiring speech. According to what you said, everything seems to work beautifully. But I was wondering if there is any problem that Grameen Bank is facing. Are there problems that keep on coming back? How do you solve them?

**Professor Muhammad Yunus:**

Well, the world is full of problems. Yes, we have lots of problems too. One problem is that Bangladesh is a disaster prone country. Every now and then occurs a terrible flood, like the one which hit our country in 1987. At that time we thought this natural disaster would never come back again in our history. The 1988 flood was even worse than the one in 1987. It was indeed the worst flood in our history. In 2004, half of the country was under water again. All over Bangladesh is situated few meters above the sea level. That is where we are. When flood comes, water enters the houses from everywhere. People put some bricks to stand on them. Then the flood keeps going up until there is no dry place inside the house so people will go on the roof. But not everybody's roof is capable of holding so many people. So people will look for dry places on the highways. If the flood continues for 1 week, people will go back to their home and look for their belongings. After 2 weeks, it is still possible to find something. The 1998 flood continued for 10 weeks. When they came back after 10 weeks, very little was left there. People had to start their life all over again. It is, again, the poor who suffer the most. Whatever they have built up before the disaster, they are pushed back to square one again. The bank has to step in to help the poor in such a way that they can restart from square one all over again. One of the principles that we try to explain to them even before the flood comes, because it will come one day, that if everything gets destroyed, they must not get upset about it. What is gone is gone. Let's build again.

What does Grameen bank do when suddenly a flash flood hit a village? The branch manager immediately declares, without consulting anybody, emergency situation. And it means something to all of us. The moment he declares emergency situation, it means all banking activities are suspended. The bank transforms itself into a rescue unit. Its job is to protect human lives. The manager will devote all his resources, manpower to rescue people, bring them to safe places, find food and medicines, and give first aid to injured people. The manager is allowed to use the bank's money, without consulting anybody, to carry out his rescue operation. So this is

how we do. Then when the flood is over, his branch will probably have to start all over again. People have lost their cows, chicken or whatever they had. Their duty is to replenish again. People will get fresh loans. What happens to the old loans? The old loans will become long-term loans, which they do not have to worry about. Fresh loans will become their current loans. People decide what they need. Some may need housing loans to rebuild their houses. Others may have other needs. So this is how we try to tackle the problems we face. Of course, we cannot solve all the problems. One of the most difficult problems is flood. We still could not find a good solution to this problem. Many people, especially children, die when they move up to the roofs. Parents holding their babies tight in their arms during the day but fall asleep at night time. When they wake up in the morning, their babies are not there any longer. This is a very common thing in Bangladesh. Every flood is a real tragedy. We have tried different methods to tie up small children or to equip them with a float so that they will not drown in the water. Besides, there are snakes and other dangerous animals taking the shelter at the same place where people have taken the shelter. Snakebites become a problem. Electrocution becomes another problem. So these are some of the problems.

Businesspeople know that there is always a risk whereby their businesses collapse. They have a choice to start their business again. This is life. As a matter of principle, Grameen bank never write off loans. Just because there is a bad flood, we do not write them off. We write off loans when somebody failed to pay, of course. It is a matter of accounting, not as a decision. People are having difficulties to pay we will not write it off. We do not do that. Loans continue with the borrowers. The bank understands problems the customers are facing and will not abandon its clients. We are always on their side whatever happens to them. So we will try to figure it out how to salvage the whole situation. This is how we do.

**Dr. Wichai Turongpand :**

Thank you. We have 2 minutes for 2 more questions. I see a lady in the back raising her hand. I would also like to invite our friends from the community to take the floor.

**Mrs. Sudarat from Thambon Ton Pao, Chiang Mai. :**

I have a few questions concerning the ecological system for the people. How can local communities deal with environmental issues? What are the methods to be used? Who is going to

be responsible for the setting up of the system? Will it be a state agency or a private company? I think if private entrepreneurs will be asked to take the lead in environmental issues, some other problems may occur.

**Professor Muhammad Yunus:**

Some of the environmental issues are very local and very specific. Some are of middle level. Others are national, international and global issues. Local issues such as conservation-related problems can be handled very successfully by their local initiators. It is a question of identifying what kind of problems they are and how to address them. It could be one single issue such as deforestation. Deforestation is a local issue. The local community is, theoretically, in the position of handling this problem by itself. However, deforestation is a legal issue. People must know whose forest they are protecting. As I was mentioning earlier, the forest in our community is the property of the government. And the law is written in such a way that whenever and whatever a non-state actor is trying to do something to or with the forest, it will be thrown out. People have to get the permission from the State first. Garbage is also an environmental issue at the local level. In many cities, garbage creates all kinds of environmental hazards. However, it can be turned into excellent fertilizers. This can be done locally. It does not have to go for petitioning or force the central government to handle it. Garbage treatment can be handled successfully by the local community. Local NGOs, groups of interested people, private organizations can form coalitions and take initiatives because the issue (garbage) affects everybody in the community. The important thing is to always keep in mind whatever policy we are taking as a collective group or as a society, that environment is an issue that must be built into our thinking. Most of the time people think about constructing buildings, digging canals, but forget to ask themselves whether how these constructions are going to affect the environment.

Then comes a bigger issue of regional, national or global levels. Just because the problem is not within our control does not mean that we shall forget about it. Are we a citizen of the country? Are we a world citizen? An individual's voice is as important as anybody else's voice so he or she must let his or her voice heard even if it was a global issue. If something happens to the globe, everybody will be affected. We live here. This is our home. We have to protect it and be careful about it. If Thailand is not doing anything bad to the environment, but somebody else does somewhere else, it is going to affect Thailand sooner or later. Therefore, we should be

protesting and saying out loud that this is not good for us. Consciousness and initiative are two key words that come to my mind. Thank you.

Thank you very much. One person can affect the world. There are so many questions and we welcome all the questions.

**Ms.Suchada from the Ministry of Finance :**

In the last few years Thailand has embarked on so many ambitious projects in micro finance. You mentioned that there is no chemistry between governments and micro finance. We know that we should step aside very soon. My questions are the followings. First, Grameen bank has gone beyond its money lending business. What are other synergies that you see as to expand your business? Who are the stakeholders that may suffer from possible failure of Grameen sister companies? Second, Are there other banks in Bangladesh that have also been a success story like Grameen bank? Or is Grammen bank a miracle case which serves as an inspiring example for all of us? Grameen bank has about 1,500 branches, each of which has approximately 4,000 borrowers. That sums up to about 6 million clients. Do all of them have access to funds? What is the ratio of the people who do and do not have access to formal banking system. Third, you said the government should set up a wholesale fund to enable small micro finance projects to take off. Would you also recommend the mobilization of other financial units, such as the local cooperatives or other micro finance, such as Sajjaomsap saving funds for those in Thailand. Fourth, 4 years ago the Thai government set up a village fund through which 70,000 villages across Thailand were allocated 1 million baht each. Indigenous financial institutions, with a large regulatory body, are to supervise the allocated fund. But instead of enacting the lending rules, they let the villages decide by themselves. So my question is, what is the role of the government in this kind of situation? How far should it get involved with the indigenous financial institutions? And now that we plan to upgrade these financial institutions into banks, meaning that they can now take deposits and micro deposits, to make themselves more integrated in the banking system. Would you suggest the government to set up the rules like they do to other commercial banks? Thank you.

**Professor Muhammad Yunus:**

I will start with the last question concerning the 1 million baht village fund. The program needs a legal structure so that it can become a financial enterprise rather than a local government enterprise. One idea is to transform it into a local micro credit bank with the capacity to take deposits and lending money. This local micro credit bank should have its own balance sheet, etc. A regulatory body should be set up to supervise this type of micro credit banks at the local level. Related laws should allow other banks to be set up as well. It should not be limited to the village funds, but expanded to other similar enterprises. It should allow competition. Do not give monopoly to anybody for anything. The law should be kept flexible enough so that anybody who says he or she can do better can step in and compete with them. In Bangladesh, some of the conventional banks do have micro credit programs. However, micro credits generally represent a tiny fraction on their portfolio. Sometimes, commercial banks lend money to NGOs to run micro credit programs in order to show that they are also connected with the micro credits. We admire that because these commercial banks have been doing it although they are not geared towards it. Even now some international banks such as Citibank and Deutsche Bank are offering micro credit facilities. Giving money to the NGOs will not get them off the hook. You know I was criticizing them. You have to run it as if it was a business of your own so that you can walk into Citibank and ask for a \$50 loan. Grameen did it. So other banks are now trying to make it happen.

**MC.:**

Thank you, thank you very much for this very important presentation. May I now invite Thanpuying Dr Suthawan to present a thank you gift to Professor Yunus.

Professor Dr. Apichai Puntasen, director of rural and social management institute will talk to us on the application of the concept of Sufficiency Economy to SMEs.

**Professor Dr. Apichai Puntasen:**

Thanpuying Dr. Suthawan and honorable guests. It is my turn to give you some insight about the situation in Thailand after the inspiring talk of my friend Professor Yunus. We are not trying to look into the Thai experience, which is different from Bangladesh. The objective of my

presentation is to introduce you to the concept of Sufficiency Economy. I will explain why the application of Sufficiency Economy is needed and how to apply it to SMEs. I will also give a comparison between Sufficiency Economy and corporate good governance on the one hand and between Sufficiency Economy and sustainable development of SMEs on the other.

This morning we have witnessed Professor Yunus's strong commitment to help the poorest of the poor, which is not a kind of incentive that is taught in our economics department. We are extremely impressed by the success of Grameen bank and very much admire its excellent and flexible management as well as the creative thinking of its founder and collaborators. It is very difficult for any formal institutions, be they private or public organizations, to replicate the tremendous success of Grameen bank. When we talk about economics, it is crucial to be able to differentiate different paradigms behind the thoughts of various economic concepts.

Nowadays, we have heard about various approaches in economics, such as Classical Economics, Neo-liberal Economics, Mainstream Economics, sometimes known as Capitalism. We also have Marxist Economics, sometimes known as Socialism. There are Reaganomics and Koizuminomics. The Japanese certainly know the latter very well. In Thailand, we have Thaksinomics. Besides, there are Institutional Economics, Green Economics, Social Economics, Humanistic Economics, Buddhist Economics and Sufficiency Economy, Islamic Economics, etc.

The fact that there are so many "brands" of Economics can be confusing. No matter how many concepts are associated to the word "Economics", all of them can simply be classified into two opposing paradigms, namely, economics which is based on "matter", and economics which is based on "mind". Buddhadhamma, which is the teaching of Buddha, is a clear example of science of mind. I want to distinguish this very clearly from the beginning. This is the reason why Grameen bank has become so successful. Examples of Economics based on material science are capitalism and socialism. Both of them stress on material growth. Unfortunately, in physics material growth also implies material decay. The only difference between capitalism and socialism is that while the former stresses on a return to "productivity" of a factor of production especially capital, the latter emphasizes more on equitable distribution. Not surprisingly, when the faith on equitable distribution is dissipated, socialism can easily be replaced by capitalism. This phenomenon can be observed in contemporary China and Vietnam. Unlike material based economics, economics based on science of mind stresses more on inner development which will

eventually lead to peace and tranquility, while material well being does not warrant such condition. This is a very important point that I want to stress here.

Economics based on mind or inner development has its root from religious ethics, such as Islamic Economics, Buddhist Economics, Social Economics, which has its root in Christianity. Sufficiency Economy derives its concept from religious ethics too. What does Sufficiency Economy mean? According to the official version of the King, Sufficiency Economy is a philosophy that stresses the middle path as an overriding principle for appropriate conduct of the people and the community at all levels.

The key word is middle path. The same concept of middle path can be found in Buddhism. “Sufficiency” means moderation, reasonableness, and the need to create self-immunity and self-protection from the impacts, which result from internal and external changes. I want to point out that we use the word “reasonableness” instead of “rational” because rational in economics implies self-interest, whereas reasonableness does not have that connotation. That is why we want to distinguish “self-interest” from “reasonableness”.

To properly implement Sufficiency Economy, an application of knowledge with due consideration and prudence is essential. This is an essential part of it. Theories and methodologies must be used with great care from the planning to the implementation. At the same time, it is essential to strengthen the moral fiber of the nation so that everyone, particularly government officials, academics and businessmen, adheres first and foremost to the moral conduct based on honesty and integrity.

In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable to create a right balance and to cope with critical challenges arising from extensive and rapid global socio-economic, environmental, and cultural changes. The concept of balance is very important. Without balance, our lives will be in trouble. Before I get to all the rules, I am going to give you a short presentation on how to apply Sufficiency Economy to business and industry. Most of the time people understand Sufficiency Economy as the way to improve the live of small farmers. Sufficiency Economy is not limited to building ponds and growing vegetables. The scope of Sufficiency Economy goes far beyond agriculture. Today, Thailand is no longer a country with its major production in agriculture. The country also has modern industry and service sectors. Sufficiency Economy is supposed to cover all aspects of our life. If we only talk about agriculture, people will wonder how it is going to be applied to industry

and services. In fact, the King has already demonstrated how to apply the concept of Sufficiency Economy to business and industry. I think everyone in this room should have an opportunity to visit the royal factory situated inside Chitralada Villa. The place is open to the public even though you may still need to get a permit to get in.

Some of you may remember the economic crisis that hit our country in 1997. A survey that has been conducted from 1997 to 2000 shows that out of the 200,000 SMEs that were operating during that period, only 8,000 survived the crisis. This seems to be a good starting point to question whether the 8,000 industries that survived the 1997 crisis had applied any concept of Sufficiency Economy in the way the King has explained. In my research, I used them as the population and extracted a sample of about 300 cases.

#### Nine Rules: Application of the King's Concept of Sufficiency Economy to Business and Industry

Rule 1. Use appropriate technology. Technology must be technically sound and inexpensive. This kind of technology must be easily made available for the people. The royal factory at Chitralada Villa use very inexpensive technology. Its operations are cost-effective. One factory will probable cost between 3-6 million Baht.

Rule 2. Use all raw materials and resources at their full utilization as much as possible. This rule is related to the concept of environmental friendliness. At the royal factory, wastes generated by a production process are collected and re-used as inputs for another production process. During the 1997 economic crisis, most of the industries which applied this rule to their production succeeded in improving production efficiency and keeping their operation at a very low cost.

Rule 3. Do not use technology to substitute human employment except to avoid possible damages to product quality. This is the case of Nong Po dairy Co-op. The King personally instructs the manager to keep hiring workers. Unemployment is a social problem. To solve this kind of social problem will cost more than the employment itself. This rule tries to look more at the social costs and benefits rather than the corporate costs and profits. The manager of the dairy told me that that his Co-op employs 700 workers, while his competitor uses more machines and only employs 200 workers. At the crisis time, the dairy with fewer workers had to

stop its operation, whereas the Nong Po dairy Co-op was able to continue its operation. This was possible because most of the workers at Nong Po were members of their Co-op. They discussed the problem with the management and agreed to have their salaries cut in order to save their employment. The decision of the workers enabled the dairy not only to survive the crisis, but also to make profits. At the end of the year, the Co-op could pay bonus to all the workers.

Rule 4. Production scale and effective management must go hand in hand. Do not try to grow too quickly otherwise you may not be able to manage most effectively.

Rule 5. Think long-term. Do not focus on short-term profit. Stable growth is an important concept in Sufficiency Economy.

Rule 6. Be honest. Do not take advantage of the consumers, workers and suppliers of raw materials. This rule has widely been practiced during the crisis years. There was a sense of solidarity among the people. Unfortunately, after the crisis everybody tried to grow fast and compete with one another again.

Rule 7. Avoid market risks by diversifying or changing products in response to the market demand. In Thailand, SMEs are very small and they generally do not practice this rule. I once visited a big dairy Co-op in Fuguoka, Japan, which offered many kinds of products. By so doing, the said dairy was able to avoid market risks.

Rule 8. Apply the concept of low risk management by using internal resources as much as possible. Do not create debts unnecessarily. This is the crucial factor in the survival of most of the industries I have studied. Industries that had decided to grow slowly and rely on their own financial resources did survive the crisis. Those which had borrowed foreign capital went bankrupt once the bath was devaluated.

Rule 9. Use local materials and supply local markets as much as possible. Whenever ready, expand gradually to regional, national and foreign markets accordingly.

Besides these nine rules, I think we still need 4 additional rules to promote sustainability.

First, human capital. Human capital is the most important capital in any production process. To replace human beings with machines is to destroy human capacity. In the past, Japanese industrials were successful in developing innovative systems by engaging people to do many works at the same time so that their working skills could be improved.

Second, social capital. This morning Professor Yunus already told us about the crucial importance of social capital and trust.

Third, environmental capital. I have heard that many OTOP entrepreneurs and other SMEs are running out of natural resources in the areas where they live and have to depend on the import of raw materials. Unless they get the raw materials at a competitive price, they will be in trouble. The key factor is the protection of the environment and the enhancement of environmental capital.

Fourth, physical capital. Least but not less is physical capital.

Should we still bother about the concept of good corporate governance once Sufficiency Economy is in place?

I would argue that good corporate governance is basically based on material science paradigm. It contains 3 major principles, namely transparency, accountability and equality.

The concept of accountability and equality for all stakeholders can be extended to cover social costs and benefits. Unfortunately most corporations do not try to extend the two concepts beyond their immediate stakeholders as the concept is rooted in its material science paradigm. Most of the private organizations and private businesses care more about their bottom line than the social costs and social benefits.

Sufficiency Economy mentions explicitly the concept of business accountability and equality *fifth rule* (“Do not focus on short-term profits”) and *sixth rule* (“Be honest and do not take advantage on consumers, workers and suppliers of raw materials”). Sufficiency Economy attaches great importance to social cost *first rule* (“Use appropriate technology”) and to the protection of the environment *second rule* (“Use all raw materials and resources at their full utilization”). It explicitly expresses social concern *third rule* (“Do not use technology to substitute human employment”) and promotes sustainability *seventh rule* (“Avoid market risks”), *eighth rule* (“Apply the concept of low risk management”). Similar concepts could be found in good corporate governance. However, Sufficiency Economy indicates greater social and environmental concern and attaches more importance to the sustainability of businesses and society than the concept of good corporate governance.

The last point of my presentation is about Sufficiency Economy and sustainable development of SMEs.

As I have mentioned earlier, Sufficiency Economy is based on “science of mind”, with an emphasis on “inner growth” rather than on material growth. As material growth is not a real concern for Sufficiency Economy, the concept is completely consistent with sustainability. Practitioners of Sufficiency Economy believe that excessive production is equivalent to excessive destruction. For them, peace and tranquility of mind is opposite to anxiety, excitement that require material satisfaction and stimulation.

**Mr. Hideaki Shimizu :**

**An application of Sufficiency Economy to SME’s in Thailand “Proposals for Thai’s mulberry paper industry”**

My name is Smith. I used to work with one of the large major chemicals called Misumishi Chemical in Japan. The Japanese name of mulberry is Kozo. Nowadays, the Thai hand-made and machine-made mulberry paper is exported to Japan. The manufacture of hand-made paper has a long tradition in Japan. For over 1,400 years the Japanese have continued to make paper. In this picture you can see a Japanese paper mill where all the products are still hand made. In Japan, there are 3 types of raw materials for paper production. These are Kozo (mulberry), Mitumata (only used for producing paper money) and Ganpi which is very expensive. There are about 250 small Japanese paper manufacturers which employ 2-3 workers to produce hand-made paper. The number of small manufacturers in Japan was 20 times higher 50 years ago and 100 times higher 100 years ago. This is a picture of a machine-made paper mill. The next picture shows the hand-made and machine-made production processes. This is a picture of Japanese paper production. As you can see, the production process in Japan is different from that in Thailand. Paper production is a very hard work. Therefore, most of the Japanese paper factories have replaced their workers with very expensive robots.

In Japan, wastewater control is very severe and dated back 40 years ago. At the national level, there are very strict legislations and related laws on waste pollution control. Specific regulations are applied in accordance with the volume of produced waste, whether it is over 10 m<sup>3</sup>/day or 50 m<sup>3</sup>/day, etc. Measurements of PH, BOD, COD and SS are also strictly regulated. A few days ago, I visited a number of paper factories in Japan. One paper factory is situated in Saitama Prefecture. It uses machines for its paper production. Takano hand-made paper

manufacturer produces 80 m<sup>3</sup> waste water per day. It is important to note that paper manufacturers producing wastewater less than 10 m<sup>3</sup>/ day are exempted from water pollution control.

This picture shows waste water processing facilities with control panel, separation tubes, sinks, ejecting facilities, drainage, etc. These facilities are controlled by the government.

Wastewater pollution has remained a difficult problem for Japanese SMEs for a long time. This was due to the fact that SMEs lacked appropriate knowledge, financial resources, relevant management skills as well as land to build treatment plants. The government tried to solve this problem by providing entrepreneurs with know-how, technologies, financial aid, lending and lease facilities with low interest rate. As a result, almost 80% of SMEs in the paper production sector have now succeeded in acquiring their own wastewater control facilities.

This is a picture of a paper mill which used to produce hand-made paper, but later was mechanized in 1960. Soon after its mechanization, the residents who lived near the factory raised a campaign against the pollution generated by the mill. The owner of the paper mill decided to sell the machine to another company with loss and resumed the traditional hand-made production again.

Concerning Thai's mulberry paper industry, I think it is necessary to install wastewater-processing facilities at each mill.

As in Japan, the government has an important role to play. It should provide necessary support, knowledge, technologies, financial aid through financial institutions, tax incentives, as well as lending or leasing facilities. How much water we need to produce it. This is something we need to think about. The production capacity is very interesting. Nowadays 4.2 televisions are manufactured per second. Where do they go? Anyone of us has at least one television set in our house. What happen with them when they are out of order? They will be thrown away somewhere. Let's have a look at McDonald's statistics. Every second, there are 500 people going to McDonald's to consume 500 burgers. Where do they get all the bread? How about wheat and meat? We also have friends on the earth. There are 2.4 newborn babies per second.

Next is about sustainability that Ajan Apichai mentioned this morning. All of us would like to see our earth developed in a most stable and sustainable manner. Do you know that the expenditures on health service are US\$ 12 billion? Do you know that the cosmetics industry earn about US\$ 18 billion per year? To solve the problem of malnutrition and save lives of hungry

people around the world, you have to spend about US\$ 19 billion. The total amount of sale of pet food in the US and Europe per year is US\$ 17 Billion. To provide drinking water to the poor around the world would cost US\$ 10 billion. The money the rich spend per year on their ocean cruises amounts to US\$ 14 Billion. The cost of immunization for every child amounts to US\$ 1.3 Billion. The total sale of ice-cream sold in one year in Europe alone is US\$ 11 Billion. If you look at the whole picture, you may want to ask whose sustainability is this and how can we solve the problem. This morning, Professor Yunus talked about quality and also equality. These are 2 issues that always come back to us.

### **Professor Kajornsak Supajaree :**

This paper is about an environmental solution for micro-enterprises: a case study on Saa paper production at Baan Ton Poa, Sankampaeng, Chiang Mai. My presentation consists of 4 parts: an introduction, a description of the mulberry paper making process at Baan Ton Poa, existing problems concerning the production, and the mitigation and the solution.

Saa paper is hand-made paper made in the Northern Thailand. Saa paper is used as material for making handicraft items such as books, calendars and souvenirs. Most of the products made of Saa paper are exported to foreign countries. We have selected Baan Ton Poa as our pilot project. The other one is management strategy. For your information on the production process of Saa paper at Baan Ton Pao, I would like to present this flow chart to you. The diagram you see here shows the production process of Saa paper. The bark which comes from all regions of Thailand is put in a tub of water for 24 hours. Then, the bark will be put into a boiler and cooked in Sodium hydroxide or caustic soda. Substances such as lignin, tannin including residue chemicals and Sodium hydroxide will be released from the cooked bark.

The bark will be washed with water 2-3 times and then bleached. Bleaching is necessary in order to change its red color to white color. Sodium silicate and Hydrogen peroxide are used during the bleaching process, which still contains some of the Sodium hydroxide. After bleaching, the bark will be washed and trimmed. This is to eliminate its hard fibers. Then, the bark will be put into a beater in order to make pulp. If colored paper is needed, desired colors can be added during the pulping process. Next step is the weighing process. The bark will be weighed into a

ball that is suitable for making a sheet of paper. Now, workers can start hand-making paper. After that, paper will be dried, collected, peeled off and put into suitable packages, ready for sale. This diagram shows the inputs and outputs of each process. For examples, in the boiling process, water, chemicals (such as Sodium hydroxide) and combustible substances (such as wood) are inputs. Steam is output. Bleaching generates wastewater. In each process, we have conducted a study on mass energy balance to check what inputs and outputs are. In the hand-making process, we do the same to check inputs and outputs. This diagram shows the soaking, cooking and boiling processes. This diagram shows the bleaching process which contains Hydrogen peroxide. We use a lot of water to wash and trim the barks. This diagram shows the beating and drying processes. This is how they prepare balls to make sheets of paper. This is the paper-making process. There are two ways to dry paper. One is to dry the paper on a screen frame. The other is to dry it by using sunlight. We also collected some samples of wastewater to check the amount and the characteristics of different substances in the water which were mentioned in the previous session. At the pulping and papermaking processes, approximately 24 m<sup>3</sup> of wastewater are produced per week. Toilets produce about 4 m<sup>3</sup> of wastewater per week. We tried to compromise the characteristics of the wastes so as to enable us to select appropriate treatment methods. This is the chemical oxygen demand (COD) which is related to the characteristic of the water that can be oxidized by chemicals. We detected 2000 milligram per litre of the COD in the pulping process, and about 400 milligram per litre from the toilets. When we combined the COD in the pulping and paper-making processes and from the toilets, we get about 2,400 milligram per litre. This figure is used to determine the treatment process of the wastewater.

A research on the production of Saa paper has been conducted in the community to identify the problems of Baan Ton Pao's papermaking industry.

First, inappropriate technology of wastewater treatment;

Second, inadequate equipment for the paper production;

Third, lack of environmental management strategies.

As far as wastewater treatment is concerned, there are two categories of treatment plants that can be applied to the community, namely on-site plant and centralized plant. The on-site plant is suitable for individual enterprises which dispose of available land to be used for the construction of the treatment plant. The treatment plant can be operated by the owners of the

enterprise themselves. On-site treatment plants are relatively expensive. The centralized treatment plant has to treat wastewater of private households and industries. The collection system, which is costly, can be pipes, sewages or tubs. To build a centralized treatment plant, a very large plot of land is needed. Centralized treatment plants must be operated and managed by specialized technicians. Inadequate equipment of the production is another problem we face. We have set up a pilot project to help improve the quality of the machines by providing on-site training programs as well as operation and maintenance course. This is a very important point because when our research team went into the community, the villagers said they preferred on-site trainings to lectures. So I gave them a demonstration on how to improve the beater machine. In order to address the problem of management strategies, two options have been selected, namely Cleaner Production or Clean Technology (CT) and Project Case Work (PCW). CT includes good housekeeping, process improvement, waste minimization, resource management. PCW includes situation assessment, developing and identification of options and selections. It is a 'Learning by Doing' process which will be conducted by micro-enterprises that are confronted with similar problems. A discussion group will be set up to identify problems and find solutions. Our responsibility is to provide guidelines and suggestions. Any decision taken will be made by the enterprises themselves.

We made a demonstration on the functioning of the treatment plant, by installing a treatment system at a factory in the village. This was done on a voluntary basis. Interested entrepreneurs, factory owners and workers were invited to see how the system worked. After the demonstration, they could decide whether they would like to have the same system for their business or not.

Thank you for your attention.

**Chaiyod Bunyagidj** (Moderator):

Thank you very much, Dr. Khajornsak. This morning before the lunch break, Dr. Apichai talked about 'Sufficiency Economy' with an emphasis on appropriate technology that suits the production capacity. This afternoon, Dr. Khajornsak has told us about the "learning by doing" process. These are two important key words that our speakers want to share with us. The Q&A

session will take place right after the social presentation. Please note down your questions or comments that you may wish to discuss with the speakers.

Next, I would like to give the floor to our friend from Korea, Dr. Soo-Tae Choo. He will talk about ‘the Application of Clean Production to Plating Process by Spot Inspection and Usage of Alternative Chemicals’.

**Dr. Soo-Tae Choo:**

Thank you. Good afternoon ladies and gentlemen. My name is Soo-Tae Choo. I come from Korea. First of all, I would like to thank the GSEI and the Office of SME Promotion for inviting me to participate in this conference. Today, I intend to present a paper entitled “the Application of Clean Production to Plating Process by Spot Inspection and Usage of Alternative Chemicals”. To make the application of clean production to plating industry work, the spot inspection or process assessment has to be conducted. The spot inspection is an important tool to control the clean production. So I will start with the spot inspection on the plating process.

From now, two topics that I will present are endeavors and effects for introducing Clean Production (CP) concept over various industrial processes in Korea and the research in plating process for introduction of CP concept.

In the first section, I will explain the roles and functions of Korea National Clean Production Center (KNCPC). Today, KNCPC has a plan to promote and support various programs such as CP, industrial development, professional standardization and education. This institute develops policies for sustainable industrial development and manages the clean production technological projects. Moreover, KNCPC establishes the clean production infrastructure and has cooperation with various international organizations such as UNIDO and UNEP.

Until now, this organization has performed many activities. KNCPC provides funds for developing environmental-friendly materials and technologies for major business areas. It supports industries to adopt Environmental Management System (EMS) and Clean Production.

In addition, this organization also promotes international cooperation with advanced countries such as Japan, Europe and USA. Besides, the organization plans to expand the professional resources and to raise cooperation awareness by education and training. KNCPC

operates the cleaner production technology training program, in cooperation with Korean Society of Cleaner Production Technology. It also develops the CP professional courses for Korean Standards Association. To develop standards on environmental management, the institute has constructed the supply chain environmental system and environment management account. In addition, we use the Life cycle Assessment (LCA) software to connect many companies and the institute conforms to ISO or International Standard Organization. Also, KNCPC takes part in the information network area related to clean production. This organization constructs the web pages on CP technological developments and constructs network with other cleaner production information portals.

The next topic is '**Results of Introduction of CP Concept in Plating Process**'. As you know, the clean production means the application of an integrated and preventive environment strategy to processes, products and services in order to increase the efficiency and reduce risks to human and environment.

Finally, CP has the comprehensive concept that contains pollution prevention, waste minimization and eco-efficiency. To control CP in the workplace, especially material and energy flow has to combine in the processes. In most cases for material balance, input is a raw material and processed water and output is the gas emission and discharged water. Clean production mostly deals with the material-recycling and managing raw materials. This slide shows the background and need for clean production system over plating process of small enterprises in Korea. Plating companies especially small plating enterprises are well known to generate wastewater. Aluminum alloy, used in various metal-based goods, are processed with treatment steps with activation by alkali solution and removal of smut by nitric acid solution. Furthermore, the small business enterprises have not installed an effective control system to reduce nitrogen content in wastewater, mostly due to the limitation of place in plating work and high cost of system installation. In addition, as you know nitrogen content in wastewater generates Eutrophication and the usage of nitric acid in plating process causes various occupational diseases.

Today, the government of Korea has issued the criteria of nitrogen content in wastewater. The concept of clean production has to be introduced into the plating process, which is different from the existing end-of-pipe technology, in order to dissolve the previous problems in small business.

Finally, CP is necessary in plating process which employs nitric acid as de-smut solution and alternative chemicals excluding nitrogen element in processed water has to be employed.

This slide shows the overview of procedure of chromate plating process. The plating process composes of three major treatment steps which are pre-treatment step, main target coating step and the final post-treatment step. Nitric acid is the solution used in the pre-treatment step to remove the smut and to activate the metal dissolution. This slide shows the potential of the nitric acid, the solution that can remove the smut and to dissolve metal effectively. Nitric acid has been used for this purpose for a long time in plating process.

This slide shows the tin-plating process. In this case, nitric acid solution is used for activating or de-smutting in the pre-treatment step too. To effectively find out some problems by using over nitric acid, we have to check and decrease the chemicals employed in the plating process. In the figures, this is each unit's step or process and on the right is the workflow in the tin-plating process such as chromate, nickel and silver coating on metal. In addition, we can easily check the mass and the energy flow as well.

This is procedure overview of the tin-plating process and the water flow line in each process. During the study, we can make use of these tables and the spot inspection in plating process. This slide shows us the mass balance and the analysis of pollution sources in nickel-plating process. In addition, you can see that in each process it generates wastewater. This table is about the aluminum anodizing process and nitric acid is used in this process to de-smut.

This table shows the analysis of raw material and operation conditions in chromate process. This is the analysis of nickel-plating process. This is the analysis of silver-plating process and next is the analysis of the tin-plating process. Now by the spot inspection of the various plating process, you can understand easily about the plating process, its operation, findings and the nitric acid usage. Therefore, we perform the spot inspection for clean production and we can design alternative chemicals for de-smut step instead of nitric acid. The design factors of alternative chemicals are high efficiency, corrosion resistance, productivity and so on.

Finally, from our various researches and previous study, we can select the new suitable chemical to replace the nitric acid but still has the same function. This slide shows us the new mixed chemical which we developed. It has the same function as the nitric acid solution to reduce the smut on the metal surface. The new chemical can also remove the smut effectively on many types of surfaces from general fiber to aluminum alloy.

The composition of ingredients combines 10% of sulfuric acid, 0.5% of the fluoric acid and 2% of Hydrogen peroxide. We can see that in the slide.

After we change to use alternative chemicals excluding nitrogen sources, the nitrogen reduction effect is about 96%. By using alternative chemical, we can estimate the economical efficiency to target chromate, silver and tin-plating process. If we change to use the alternative chemicals we will save about 10,000 dollars per year.

Based on this data, I would like to conclude that in Korea, KNCPC has been supporting and promoting various programs such as R&D, standardization, education to introduce clean production in industrial works. Besides, many Korean small companies have involved positively in these CP programs and endeavored to improve the poor working environment. Finally, in the case study of plating process to introduce CP concept, the new alternative chemicals replacing nitric acid could be successfully applied in de-smutting process of plating work in introducing CP concept of source reduction.

This is the end of my presentation. Thank you for your attention.

**Chaiyod Bunyagidj:**

Thank you very much, Dr. Soo-Tae Choo for your very interesting and detailed presentation. The electro-plating maybe something we are not aware of. Let's look at the automobile-parts, motorcycle parts, rice-cookers, refrigerators and anything made of metal in your home or in your car. They are electro-plated. To clean up the metal surface before plating, it was necessary to use nitric acid. Now less toxic chemicals can effectively remove the smut. This new chemical is less harmful to our health and our environment. Besides, it is less expensive than nitric acid solution. It is obvious that CP helps improve people's health as well as economic and environmental efficiency. Thank you very much.

Next, I would like to invite our neighbor and friend, Dr. Rakmi Abdul Rahman. She will talk about the '*Greening of Batik and Tanning Industries in Malaysia*'.

**Dr. Abd. Rahman:**

Thank you. Good afternoon. We heard a lot about the cleaner production which consist of treatment and preventive measures. Batik and tanning are important industries which mostly produce polluted wastewaters because of the dyeing substances or ‘recalcitrant organics’ and chemical dyes. These chemical substances, which are discharged to the environment, cause a lot of long-term effects.

I am from the Chemical Engineering Department where processes for SMIs and SMEs are being developed. SMIs and SMEs contribute to about 97% of the industries in Malaysia. This is quite similar to other Asian countries such as Indonesia or Thailand.

The existing environmental management in Malaysia consists of the management of cleaner production (CP), management of effluents and the socio-economic implications. So far, the management has been focusing on ensuring that factories meet the effluent discharge limit or discharge standard and the hazardous waste disposal procedure under two main regulations affecting the two industries.

The first regulation is the Environment Quality Sewage and Industrial Regulation. Under this regulation, there are Standard A and Standard B. The Standard A is designed for industries discharging above the water intake point (WIP) or above the point where water is taken for processing into drinking water. The Standard A has to be strict, especially for things such as dye substances. The Standard B will be downstream of water intake point. This is applied very strictly for those discharging above 50 m<sup>3</sup> per litre. Most small industries do not discharge that much. But now we are developing industries’ specific limits because some small industries generate very small volume of waste but very toxic to the water. This is the case of wastewater which contains high volume of heavy metal and toxic substances.

The second regulation is the Environmental Quality Scheduled Waste Regulation 1989 . Under this regulation, any wastewater containing dyes from pulp is considered as hazardous which is called ‘scheduled waste’. Scheduled waste means the listed wastes that cause other effects than those which are commonly caused by the so-called ‘hazardous’ waste. The effects caused by scheduled wastes can be carcinogenic or accumulative over the time. The scheduled waste must be disposed of in a secured landfill or processed by the company of Kualiti Alam Sdn Bhd which has the exclusive authorization to take hazardous wastes. This is due to the fact that

the disposal and transport processing are so costly that no other companies can afford to do the job.

This diagram shows the limit under the Sewage and Industrial Regulation. You can see the two rows, A and B. It is just the list of the limits including BOD at 20 degree centigrade and 20 mg/L for law A. I think it is similar to the figures from Japan and Thailand. COD is about 50 hundred and you have the list of about over 20 of substances; such as heavy metals, free chlorine, sulfide.

This regulation came into effect in 1979. A new parameter concerning Nitrogen was added to the existing regulation. Increased population has augmented the amount of Nitrogen disposed to the river. The situation has become dangerous especially during the dry season when the ammonia content in water is too high which results in the closing of some of the water treatment plants. If you are to take the water for treatment it will consume a lot of chlorine or generate carcinogenic substances.

Specialists are now proposing new amendments of additional parameters to be incorporated in the regulation. However, the law has not been passed yet because of the protest from a number of factory owners.

This diagram shows the limit for Nitrogen, which is very low (5 mg/L) and the limit of color, which is low too. These limits are going to affect tanning, textile and batik industries as well as many other handicraft industries. For example, by the Standard A, the limitation at 10 mg/L is very low. Actually when you look at the amount of 10mg/L in terms of color it will be almost colorless.

The limit on chemical substances such as nitric and nitrogen are necessary if you want to have eco-labels for the product. Many South East Asian countries are not ready to meet any of such labeling restrictions yet. Korea is quite advanced in pollution control and many of their products have eco-labels. Under the eco-labeling and under ISO 14025, there are six categories of the impacts, one of which is Eutrophication. Therefore, it is very necessary to introduce the limit on chemical substances such as Nitrogen.

This picture shows the bath for batik which has a very strong color. Water that is used for washing the floor becomes the floor-washing effluent. Wastewaters containing chemical dyes from batik industries will not only impose the color on the effluent but contaminate it.

This diagram shows the modification of existing limits that have been introduced, for example COD limit from 50 and 100 to 80 and 200. This is the lowering of the standard because many industries produce recalcitrant organics and cannot meet the COD discharge standard. Paper mills or even the recycled-paper mill manufacturers find it very difficult to meet 200 mg/L limit. Other modifications propose the tightening up of discharge standards except for oil and grease which used to be non-detectable. Tan now is 1 mgs/L. Many industries are actually tightening up their discharge standards.

This diagram shows what we call *equalization, physical chemical treatment and biological process*. Physical chemical treatment of a large amount of sludge requires high chemical cost. In Malaysia, sludge has to be sent to the effluent or to the hazardous waste management company, which increases cost. It is therefore necessary to reconsider the management of wastewater in SMEs by using CP and introducing a simpler but effective treatment process.

This picture shows the tanning process. This complex process includes removing of the flesh, removing of the hair and pickling and so on. Tanning produces a lot of COD including high volume of color and salt which limits the reuse of the wastewater. COD will contribute to the acidification of the wastewater of the environment. Acidification is one of six impact parameters under eco-labeling. In tanning process, the effluent is very strong and highly colored. The picture shows the very strong color. This is from kids' Teddy plant where ready-made skins are used. Our review shows about 3,000 mg/L and 2,000 COD.

The process is simpler in the case of batik making. However, most of private enterprises use a lot of dyes and still lack appropriate environmental management. Batik industries help create jobs in many rural areas. We need to make sure of demanded use of raw materials, utilities, especially water and electricity to minimize the waste flow so as to make the treatment process cheaper. Regular auditing and evaluation will help improve the process. Factories owners must be aware of the best appropriate technology available in the market. All processes can be designed for SMEs.

This table is about cleaner production. Concerning the eco-labeling calculation, it consists of the calculation of *the sourcing of raw materials*, *the processing*, *the use of the product* and *the minimization of waste*.

These slides show the whole cleaner production. You can look at it one by one in your hand-outs. This is one of the CP measures. To turn around the pipe in the rinsing process will help reduce the wastewater generation by 30%. The main impact is on the cost reduction. It is crucial for SMEs to have access to appropriate and simple wastewater treatment technology.

This slide shows the oxidation and biological process which will be marketed by my university. This actually cracks up the recalcitrant organics and reduces the color in the water. The COD hasn't been cracked. Its residue is not down to zero. But it can be brought down to zero by the biological process.

Nowadays it is possible for small and medium enterprises to operate clean industries. Eco-labeling makes it easier for entrepreneurs to export their products. In Malaysia, the Vice Prime Minister is now trying to popularize hand-made batik, bringing it to Paris. It is an excellent idea because these are high quality products. Besides, batik industries help create jobs for the rural people.

Thank you.

**Dr. Chaiyod(Moderator):**

Thank you very much. We have learnt a lot from your excellent presentation. Dr. Rakmi Rahman gave us the overview of the application of cleaner technology or cleaner production in Malaysia with an emphasis on Batik and tanning industries. Hand-made and beautifully dyed batiks are popular in Thailand and can be purchased in Phuket or Krabi. This textile industry helps create jobs for the people in many rural areas. However, the use of dyes may cause toxic wastewater. So how can the people make batiks and have clean environment at the same time? Dr. Rahman has just explained how you can do that. We have also learned about the application of clean technology in tanning industry. In Thailand, most of tanning industries are concentrated in the province of Samut Prakarn. Dr. Rahman has given us the examples of two industries which are typical in many developing countries.

Now, I could like to move on to the next speaker, Mr. Qiu Jin from China. He will talk about the clean production for SMEs in China.

**Mr. Qiu Jin: (Presentation was given in Chinese)**

*(Translator1):*

The Chinese government is now very keen in developing clean technology. In the past, the investment in environment was less than 1% of GDP but it has now reached 1.4%. In the developing countries it represents 3%. From the last thirty years, China has developed a more complete eco-development system. In China, there exists a very large number of SMEs all over the country. Many of these enterprises are operating quite well. However, much effort has been focused on the West side of the country, where environmental management is lacking and needs to be reinforced.

*(Translator2):*

First, it is well known that the national economy of China has maintained a rapid and stable growth rate ever since the reform and opening up policy was implemented. Small and Medium Enterprises (SMEs) have played an increasingly important role during this process.

And there were almost 200,000 industrial enterprises in China by the end of 2003 and the number of SMEs has approximately increased by 88%. Also it contributed about 43% of the total national tax revenue and 75% of the total employment. These figures have demonstrated that SMEs have made tremendous contribution to social and economic development of China. Therefore, the Chinese Government has attached great importance to the development of SMEs, formulated the *Law of the People's Republic of China on the Promotion of Small and Medium-sized Enterprises*.

However, SMEs are major players of environmental pollution due to their small production scale, outdated technology, high-energy consumption, heavy pollution and unstandardized treatment process. Take papermaking and textile as an example, the number of the enterprises of the two sectors accounts only for 15% of the total, and most of them are SMEs.

The Chinese Government pays special attention to environmental protection work of SMEs and has taken various measures to ensure proper environmental protection during the development of process of SMEs. This problem cannot have put for strategies of sustainable development in a bid to effectively address the issue of environment and development as early as in the 1990's. Such a strategy was further developed into the scientific concept on development in recent years. During this period, China has taken the following two major measures:

First, we have carried out industrial restructuring to control structural pollution. We have phased out a batch of production processes, equipment and enterprises that apply out-of-date technology, waste resources, generate heavy pollution, have no market and no hope for pollution treatment according to the law. Such actions have reduced the load of industrial pollution and reduced structural pollution. In August of 1996, the State Council issued the *Decision on Several Problems of Environmental Protection*, demanding the banning, close or production halting of 15 types of existing small-sized enterprises. Besides, the Central Government regularly publicizes the catalogue of production technology, techniques, equipment and products to be phased out within a prescribed limit of time.

Second, we have transformed the economic growth mode and implemented clean production. In 1992, State Environmental Protection Administration (SEPA).....

**Mr. Qiu Jin**(Translator2):

...of industrial pollution must be shifted from the end-of-pipe treatment to overall production process control. And the clean production should be implemented. In 1994, the State Council issued that *China Agenda 21*, setting up the special field of developing clean production and producing green products. In 1996, the State Council issued the Decision on Several Problems of Environmental Protection. In 1998, China signed up the *International Clean Production Declaration* and it became one among the first groups of signing countries of this declaration. In 2002, China promulgated the *Law on SMEs* stipulating that one of the uses of the National Production Fund for SME should be for the support of the implementation of clean production among SMEs. In the meantime, China also promulgated the *Law on the Promotion of Clean Production*. As a result, clean production policy has implemented in an all-round way in China. Within the decades, at the initial stage of clean production, the work was gradually promoted in China.

For years, SEPA has made substantial progress in such areas: demonstration of the clean production enterprises, personal training, institutional and legal development.

First, in terms of enterprise demonstration, most provinces and cities have already carried out examination work on clean production.

The examination work has enhanced innovation in production techniques and technology, improvement of production management level, recycling of material and reduction of resources and energy consumption.

Second, in terms of personal training, we strengthen clean production training program and improve publicity on clean production. Up to now, almost 600 cleaner production training programs have been conducted through different channels.

Third, regarding the institutional development, nearly 40 sectors or local clean production centers have been established.

Fourth, in the aspect of legal development, in order to implement the *Law on the Promotion of Clean Production* and fulfill the responsibility of environmental protection department, the government had issued the series of documents. In 2003, SEPA issued the *Proposals on the Implementation of Law on the Promotion of Clean Production*, and in December 2003, the General Office of State Council relayed the *Proposals on Accelerating the Implementation of Clean Production*. Also, in 2004, SEPA and the NDRC formulated the *Provisional Measures on the Approval of Clean Production*. Furthermore, SEPA also developed the standards and the guidance for clean production. So far, three industrial standards for clean production have been issued and ten draft industry standards for cleaner production have been completed; moreover, the draft industrial standards for clean production in other 17 industries are under solicitation stage.

Fifth, in the aspect of the international cooperation, China has carried on extensive international cooperation with international organizations such as World Bank, UNIDO, UNEP, UNDP and Asia Development Bank as well as the foreign countries such as USA, France, Australia, Japan, Canada, The Netherlands, Denmark and Norway.

Besides the central government and the local environmental protection institutes such as Yuan Ning, Jiang Su, Xen Dau, Guang Dong, etc. have promoted and implemented the clean protection.

*(Translator1):*

The implementation of clean production has generated both economic and environmental benefits. According to the statistics of over 200 pilot enterprises, carried out by State Cleaner Production Centre, about RMB5 million Yuan, has been gained and the amount of major

pollution has been cut down by 40%, showing remarkable environmental benefits. Clean production has achieved a win-win situation for both economy and environment.

Further efforts will be focused on the following aspects in order to promote clean production and foster a new path of industrialization.

First, vigorously promote circular economy. Absorbing the experience of western developed countries and based on the concept of clean production, we put forward the idea of secular economy in recent years and carry out secular economy demonstration activities at different scopes in enterprises, conglomerates, cities or regions. Sound effects have been achieved. We will keep promoting various pilot demonstration activities on secular economy, study and develop the Law on the Promotion of Secular Economy and making plans to develop secular economy in key areas and industries.

Second, conduct mandatory audit on clean production. Based on the investigation on the real situation of enterprises, we review the enterprises that are subject to compulsory audit on clean production, make public the name list of enterprises causing heavy pollution and guide enterprises to undergo clean production audit.

*(Translator2):*

Third, continue the demonstration and replication work of clean production, apply clean production technologies in and all round way and guide more enterprises to implement clean production. At the same time, the requirements of clean production will also be incorporated into the work of creating environmental friendly enterprises.

Forth, strengthen affords to make cooperated environmental information transparent. In September 2003, in order to implement the law of People's Republic of China on the Promotion of Clean Production, SEPA decided to have the enterprises across China to make their environmental information made public so as to facilitate public supervision on corporate environmental behavior.

Fifth, gradually implement performance assessment system on clean production of enterprises. We will evaluate corporate performance on clean production in a timely, accurate and just manner in accordance with laws and regulations. In addition, we will enhance the management and supervision on clean production of enterprises under compulsory program.

Sixth, incorporate the requirements for clean production into environmental impact assessment. SEPA proposed that environmental impact assessment on construction should include the components of clean production as early as 1997. According to the *Law of People's Republic of China on the Promotion of Clean Production*, environmental impact statement shall include a chapter on clean production. The law stipulates that basic construction and technological reform projects give priority to clean production technologies, process and equipment and minimizing environmental risks imposed by such technologies and products. Environmental protection departments shall not approve the environmental impact statement of construction projects applying backward or out-of-date technologies and equipment to be phased out in a given period of time.

Seventh, enhance international cooperation and exchange on clean production. Developed countries enjoy a long history of clean production and have accumulated rich experience and technologies. With the help of international cooperation and exchange, we can learn advanced experience and best practice from foreign countries, raise the level of clean production and accelerate the development of clean production in China. Clean production is still at an early stage in China and there is huge market potential. With increasing competition and raised quality of economic development, China's accession to the WTO and the full implementation of the Law of People's Republic of China, Chinese enterprises will have more and more initiatives in clean production, which will serve as a driving force for the market. We earnestly hope to join in hands with foreign industrial circles and government departments to promote the development of clean production and make positive contributions to sound economic growth and sustainable development of China.

Ladies and Gentlemen. China's environment has been improved. Thank you.

**Dr. Chaiyod Bunyagidj:**

We have been listening to many interesting presentations on traditional paper making, batik, tanning and plating industries. We have heard about government policies on environmental protection and concrete measures to improve the performance and environmental management in the SMEs sector.

Before we continue, I would like to mention some technical terms which are used in many presentations today. The term '*cleaning technology*' or *CT* is originated in Europe. They have clean production which is UNET. In Japan, people use the term '*green productivity*' or *GP*. In the business sector, it is called '*equal efficiency*'. Engineers use the term '*waste minimization*'. In fact, the fundamental principle is the same for everybody. However, the applications are different depending on what you do and where you are. But whatever you produce or wherever you live, the main objective remains the same, namely *prevention is better than solving the problem*. This concept has been exemplified in Sufficiency Economy. Many speakers have talked about the importance of capacity building process through training facilities as well as demonstration programs. Besides, we have also learned that a number of legal measures and frameworks have been put in place in China to promote clean production in that country.

It is my hope that when each of us go back to our country and our workplace, we can make use of the knowledge we have acquired here and continue to share our experiences through the network which has been created at this forum. Again, I would like to thank our four speakers for their great presentations.

**MC :**

I would like to thank all the speakers for their excellent presentations. Thank you, Dr. Chaiyod Bunyagidj for having accepted to be our moderator. May I invite Prof. Dr. Apichai Puntasen to give thank you gifts to our speakers and the moderator.

Dr. Chaiyod Bunyagidj, Assoc. Prof. Dr. Khajornsak Sopajaree,

Dr. Soo-Tae Choo, Dr. Rakmi Abdul Rahman, Mr. Qiu Jin

Thank you, Dr. Apichai

**MC :**

Welcome back to the economic and social session. May I now invite Dr. Wichai Durongpand to be our chairman of this session. I would also like to invite our following speakers to the podium.

-Dr. Udomsak Silaprachawong

-Dr. Soparatana Jarusombat

-Mr. Quarch Huy Thong

- Mr. Abraham Varampath and
- Dr. Ren-Yow Huang

The floor is yours, Dr. Wichai. Thank you.

**Dr. Wichai:**

We have about an hour from now. We have five speakers for this session. The first speaker will be Dr. Udomsak who will present a paper on *'Sufficiency Economy and the SMEs Environmental Management: A Case Study of the Mulberry Paper Industry at Ban Ton Pao, ChiAng Mai'*.

The second speaker is Dr. Soparatana, from Thammasat University. She will make a presentation on the issue of *'Public Participation in Enhancing SME, Environmental Management and a Case Study of the Mulberry Paper Industry at Ban Ton Pao, ChiAng Mai'*.

The third speaker is Dr. Quarch Huy Thong from Vietnam, who will talk about the *'Use of Cleaner Technology to Reduce Environmental Pollution in Micro Enterprise'*.

The next paper is entitled *'The REACH and Its Implication on the Indians Industry: the Analysis of REACH: Implication beyond EU'*, presented by Mr. Abraham Varampath from India.

And the last paper, presented by Dr. Ren -Yow Huang from Chinese Taipei, is entitled *'Sharing Experience of Sustaining Taiwan Local Industrial Environment'*.

Now, I would like to invite Dr. Udomsak to start first. Thank you.

**Dr. Udomsak:**

Thank you, Dr. Wichai. Good afternoon. Today I'm going to present a paper on Sufficiency Economy and the SME environmental management: a case study of mulberry paper industry at Baan Ton Pao, Chiang Mai. This paper has been commissioned by the Office of the SME Promotion. We went to Baan Ton Pao to visit the site and interviewed the producers and manufacturers of mulberry paper. We also conducted a research on environmental management at Baan Ton Pao. SMEs are the backbone of the Thai economy. It is estimated that SMEs contribute over 40% of Thailand's GDP. The Thai government has set up an *'One Tambon One Product'* or *OTOP* program in order to build capacities and develop necessary skills in favor of new entrepreneurs. However, in several places, SMEs do create environmental problems such as the

problem related to untreated wastewater. This is, in fact, our initial concern regarding the mulberry paper production at Baan Ton Pao, in Chiang Mai province.

This is a photo of a mulberry tree which is taken from the site. This diagram shows the paper production process at the Ban Ton Pao. The barks, which are used for the paper production at Baan Ton pao, are imported from Laos or Uttaradit Province in Thailand. This photo shows the boiling process. Chemical substances such as Sodium Oxide and Hydrogen peroxide are added. After the boiling process, the barks will undergo fiber-grading process. This picture shows the pulping, forming and drying processes. This picture shows a sheet of dried paper, ready to be used as the raw material for creating more valuable products, such as photo albums, boxes and containers. This picture clearly shows how local manufacturers dispose wastewater after the boiling process without any appropriate treatment.

Now, I would like to talk about *the application of the concept of Sufficiency Economy* in building a healthy community at Baan Ton Pao. The result of our interviews shows that the owners of mulberry paper industry need environmental management. Wastewater is their major concern, especially for the village which has paddy fields. This is because the wastewater can damage soils and destroy rice production. I think the expansion of paper production in the late 1980's has resulted in the abandonment of the agricultural land. Furthermore, the development of paper industry has had negative impacts on people's health, especially severe respiratory diseases. Some workers even died of cancer. There exist some scientific evidences which show that these cases maybe caused by the paper production.

The concept of sufficiency economy is about *moderation, reasonableness and self-immunity from the unexpected events*. In addition, to make Sufficiency Economy work, two more factors are indispensable, namely: *knowledge and morality*. Without knowledge and morality, sustainable economy cannot be achieved. Sufficiency Economy has taught us that the production of mulberry paper at Baan Ton Pao should be kept moderate and in total harmony with the nature. The industry should be developed in a sustainable and reasonable manner. In other words, the paper manufacturers should not operate the business over their production capacity. They should not invest too much and rely on their financial resources rather than borrowing money from financial institutions. In order to create a self-immune system, the owners should employ only local workers and utilize raw materials which can be acquired locally. According to the interviews, some producers admitted that they have imported mulberry barks from other

countries; such as Laos or Myanmar. Some of them probably employed illegal workers from Myanmar. The inhabitants of Baan Ton Pao want to have a community learning and development center which provides information and knowledge on development alternatives. They said in the interview that their village should develop other types of activities, such as tourism industry. Activities which are environmental friendly are also preferred. The villagers advocate the idea of creating a community development master plan. This is quite similar to what Dr. Yunus said this morning about the 16 decisions. This is exactly what Baan Ton Pao needs. The objective of the community's master plan must not only be economically oriented but also include social issues such as health benefits and social welfare. We have come up with two strategies to solve the problem at Baan Ton Pao.

First, we focus on '*Product Strategy*' such as green labeling. Manufacturers using environmental friendly inputs or methods in the production process; such as the use of natural colors in the dyeing process or the application of energy saving schemes in the production process, should get a certificate or a green dot from the Office of the SMEs Promotion.

Second, we emphasize on '*Process Strategy*' through the implementation of clean technology in the production. We suggest that SMEs banks give micro credits such as soft loans to paper manufacturers to implement clean technology. However, it is important to make sure that SMEs banks also give financial aid to very small and poor manufacturers.

I would like to conclude my presentation here. Now, I would like to invite Dr. Soparatana to present her paper.

**Dr. Soparatana:**

Good afternoon. I would like to take maybe a few minutes to share some of information with you. Our research team, Prof. Benja who is in this room. This information is not complete. I hope our friends from Baan Ton Pao can give further details about it.

The mulberry paper industry in Baan Ton Pao creates many environmental problems. Over 100 years, Baan Ton Pao has been well-known for its traditional papermaking activities. However, since 1981, the government has tried to encourage the mass production of Saa paper by introducing new production technologies. The change of the production process increased the income of the manufacturers, but contributed to the deterioration of the environment. The major problem is the discharge of wastewater. Communities that are situated along the canals as well as

those in the vicinity of Baan Ton Pao are suffering from adverse effects of the factories' wastewater. Nobody knows how to deal with this problem. As Prof. Yunus mentioned in the morning, producers, manufacturers and those who are related to this problem must take an initiative to deal with this complex problem. Like many other traditional communities which are undergoing the transformation process from rural into urban communities, Baan Ton Pao is also in transition at the moment. This situation has made it even more difficult for the people to deal with the environmental issues. In a rural community, people do help each other, whereas in the urban area people will compete with each other. This is due to economic pressures as well as the social and cultural change.

In Northern Thailand, communities in the rural area are grouped into "Pok". The word "Pok" means a group of communities where people who are relatives, live and work with each other. There are three Poks around the Baan Ton Pao area. Many people in these Poks care more about the selling of mulberry paper than the environmental problems they are facing. I think it would be beneficial for their communities if people in every Pok could set up appropriate mechanisms to solve the existing environmental problems.

A few years ago, we discussed the problems with paper producers and manufacturers. Everybody accepted that the wastewater was a quite serious problem. Some of the producers and manufacturers used new production technologies by acquiring modern and costly machines and equipment. However, they were not satisfied with the outcomes. I think it is necessary to find a more appropriate technology for them. Regarding the wastewater problem, the municipality of Baan Ton Pao constructed a drainage system around the area. Unfortunately, the problem still exists. Right now, the municipality has a plan to build a central wastewater facility in the community. The local people have not accepted this plan yet. During an informal meeting with the local people, we found out that there were different sorts of conflicts within the community and the people did not trust each other. They also lacked legal knowledge and management skills which would enable them to tackle the problem effectively. As a political scientist, I think we should create a people forum in the community to enhance public participation in environmental planning. As Dr. Udomsak mentioned earlier, this community environmental planning could help the people solve the problem. However, capacity building facilities including relevant technical support regarding the wastewater treatment must be provided to the people to ensure its successful implementation.

These are a few suggestions which are the result of my 3-month research. Thank you.

**Dr. Wichai:**

Thank you very much, Dr. Udomsak and Dr. Soparatana for your comprehensive presentation on the application of Sufficiency Economy and on the importance of the public participation within the context of the community of Baan Ton Pao. There is a question that Prof. Dr. Hideiki Shimizu can help explain. There are many good lessons that can be applied to Thailand as well. An important point which was mentioned by our two speakers is about the market pressure which lead to the environmental deterioration. This is a very good point that we should think about.

Next Mr. Huy Thong from Vietnam will talk about air pollution and cleaner technology. Thank you.

**Mr. Huy Thong:**

Thank you. Good afternoon. The coordinator who assisted me in collecting data in this paper was Dr. Ranjith Perera from the Asian Institute of Technology. However, due to his previous engagement, he cannot attend the seminar today.

Vietnam has many traditional villages like Japan and Thailand. In Thailand, the government has set up a 'One Tambon One Product' program. In Vietnam, many villages are developing tourism industry and promoting their handicrafts, such as ceramics, furniture, silk, paintings and household goods.

Our case study was conducted at Bat Trang, a traditional village very well known for its pottery. The main objectives of the research are to study how to apply cleaner technology to reduce environmental problems and to improve the environmental management with the participation of the community as well as to raise environmental awareness of the people.

This diagram shows the pottery making process, which can be divided into 3 parts, namely making pieces, decorating pieces and baking products. Pottery making generates not only solid waste and air pollution but also wastewater. Air pollution is released from the baking process. Substandard and damages products are either recycled for other purposes or destroyed and disposed of. I would like to talk about cleaner fuel. In the past, pottery factories at Bat Trang used fossil fuel or a coal-firing to bake their products. Later, gas-fired kilns were introduced. We

find that thanks to gas-fired kilns, the baking time can be shortened, thus reducing the amount of air pollution. Carbon dioxide, Nitrogen, Sulfer dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> are about two to five times higher than the national standard.

This picture shows the waste dumped on the bank of the river , affecting the ambient air around the community. Fuel and coal briquettes sticking on the wall have an adverse effect on the beauty of the site and its architecture.

This diagram shows a comparison between gas and coal consumption. Coal causes pollution and damages human health. Gas kilns are costly but environmental friendly. Therefore, we have to encourage the people to use gas kilns which will help reduce air pollution, solid wastes, and wastewater in the community.

Thank you.

**Dr. Wichai Turongpand:**

Thank you very much for a very concise and straight to the point presentation. Mr. Huy Thong highlights a very important and critical issue on how to reduce air pollution by decreasing the consumption of coal and the generation of solid wastes. Another interesting point is how to encourage people in the area to continue their traditional production activities without damaging the environment.

Our next speaker is Mr. Abraham Varampath who will talk about ‘the approach or the analysis on REACH that stands for the Registration Evaluation and Authorization’.

**Mr. Varampath:**

Good afternoon. In the globalization, the environment policy is made in Europe. This paper is to show how the environment policies which are made in Europe can affect Indian industry, particularly the SMEs. The implications of these policies do affect not only India but also many other countries in Asia.

We all know that today chemicals have become a part of our daily life. There are chemicals in almost everything; food, textiles, clothing, electronics. We have chemicals everywhere. Many chemicals cause environmental problems. Let me give you an example; chemical pesticide.

The chemical pesticide is put on to the farm to kill pests. This dangerous substance is harmful to both human beings and the environment because it kills many beneficial micro-organisms. The production of these chemicals requires a lot of resources, energy and fuel. So both the product and the process by which the chemicals are made do create a lot of problems. For risk prevention, there is a policy called REACH. REACH stands for Registration Evaluation and Authorization of Chemicals. Initiated by the European Union, REACH is likely to come into force in Europe *in 2004 to 2007*.

What are the objectives of REACH? The primary objective is to increase competitiveness of the European industries and to improve the environment and human health. To enhance the competitiveness means that people must be able to sell more of their products.

What is the whole process about? Now, the manufacturers or importers in Europe, who buy chemicals or articles which have chemicals in a quantity of one ton or more per year, will have to register. The registration dossier is a document that proves whether there are chemicals in the products and whether these chemicals are harmful to human and the environment. The dossier has to be submitted to the European Chemical Agency for evaluation. The Agency will check whether all the properties of the chemicals have been clearly listed. Should the document does not contain this information, the chemical substance in question will be subject to further evaluation.

The system brings in both chemicals that are 'existing' or used prior to 1981, and the 'new' chemicals which are used after 1981. After the evaluation, should the Chemical Agency find that there are risks to environment and human health, an *authorization* has to be given. This authorization will be given only in case that the risk management strategies have been revised with the manufacturers or the importers. Some of the samples of these chemicals are carcinogenic and bio-accumulative. The Chemical Agency can ban the use of chemicals and the products which contain those chemicals.

That is what I would like to talk to you all. People use chemicals in their industries for instance bio hue in textiles. Bio hue has caused much concern in Europe. If people put chemicals in one product and those chemicals can harm the environment then they have to register the document. After the registration, if it is found that these chemicals are bio-accumulative; then, a special authorization for management strategies is needed. Should people fail to comply with it, they will be banned.

The environmental policies are made in Europe but have important implications for all Non-EU suppliers. The European Union purchases products from different countries. Therefore, the implications are on the entire supply chain. If a European importer buys more than one ton of chemicals, let's say, from buyers in India, he or she also has to comply with the REACH system. That is, the importer has to register and find all the risks contained in these chemicals and find the risk management strategies, etc. In other words, the system definitely affects the downstream industries as well. Finally, if people export some chemicals or textiles to Europe, they have to comply with the REACH system too.

Now I would like to move on to the implications on the Indian industries. According to the 2003 statistics, Indian economy is growing very fast. The expected growth is between 10%-11% in the coming year. The GDP in the industry is increasing by 6%. It is important to note that SMEs constitute the backbone of the country. They contribute to 50% of the GDP. There are over 3 million SMEs in the country.

What are the implications? If REACH is implemented, some suppliers in some industries; for example, the textiles, the chemicals and agricultural products who export goods to Europe will be affected.

I would like to give the overview of the chemical and the textile industry. The chemical industries are quite large and contribute to 2% of the global chemical industry and the textile industries contribute to 30% of the export earnings and contribute to 3% of the global textiles trade as well.

What are the concerns of the exporters and manufacturers? One of the concerns is trade barrier. Registration incurs expenses regarding the collecting of data on the chemicals, on the risk management strategies, and properties, etc. If producers cannot comply with the regulations, they may have to use cleaner technology which is costly. In other words, their products will cost more and may no longer be competitive. Due to their limited resources, it is difficult for SMEs to comply with these regulations. There are industries that use one or two kinds of chemicals in the production process, for example, the dyeing industry. Manufacturers may use only one chemical to dye textiles. If that particular chemical is banned in Europe, the manufacturers may have to close their businesses or look for other alternatives. In order to assist SMEs in dealing with the REACH system, 2 infrastructures should be put in place. One important infrastructure is to help collect data and substances and to provide downstream SMEs with information on the

chemicals and the properties. The second infrastructure is to improve laboratories to test chemicals according to EU standards. For more information, you can visit our website. I would like to thank you all and the organization for giving me the opportunity to present my paper. Thank you.

**Dr. Wichai Turongpand:**

Thank you very much, Mr. Varampath. Actually, I have a question. You mentioned the problem of trade barrier due to the fact that most suppliers are non-EU and that they have to comply with the EU regulations. SMEs are too small to voice their concern and fight for their rights on the international trade arena. What do you think? Is it good for the SMEs? If the EU really impose REACH and we accept this, is it good to have REACH, if we consider from the side of EU?

**Mr. Varampath:**

Well, what I have presented is the view of the industry. If I have to give my personal view, I think it is a blessing in this case. We have had a lot of difficulties in streamlining the environmental performance in SMEs for a long time. It might affect businesses but they might take an initiative to improve or look at the transfer of technologies too. It is a positive thing. This is not my personal view but the view of the industry.

**Dr. Wichai:**

Yes. It helps screen dangerous chemicals. All the processes can also be checked along the way. This is the reason why I take one or two minutes here to ask this question. However, you have clearly expressed your personal view on this. I would like to leave this question to the audience for further discussions. Our next speaker, Dr. Huang, from Taiwan. Dr. Huang is director of the Division of Management Consulting SMEs.

**Dr. Huang:**

Good afternoon, everybody. First of all, I would like to thank the organizers, the GSEI and the office of SMEP, for inviting me to come to Bangkok. This is my second time here. I first came here 11 years ago. Today, Bangkok has become a successful and modern city. I have spent

15 years in Madrid, working for my government. I can express myself more fluently in Spanish than in English. However, I will try to do my best.

I will present you the information on Taiwan's SMEs, our strategies and related measures for SMEs. I will talk about the 921 earthquake, the promotion of environmental conservation, and the government's related policies on the protection of the environment.

Lastly, I will present to you a case study on the promotion of environmental conservation in a community.

Taiwan is very small, with the area of 36,000 square kilometers and the population of 23 millions. Last year, Taiwan's per capita income was approximately US\$ 14,000. A colleague here in Bangkok at the Taipei Economic Culture Office told me that there are about 140,000 Taiwanese and 3,000 Taiwanese companies in Thailand. Our bilateral trade has generated mutual benefits for us, especially in the investment area. Regarding the SMEs, there are over 1,171,780 enterprises in Taiwan. The proportion of SMEs share is about 97.83%. I think the proportion maybe around 98% last year. SMEs contribute 77.56% of the total employment, 71.47 % of the direct export .

The size of SMEs and micro businesses in Taiwan varies according to the sectors. In manufacturing construction, mining and quarrying sectors there are approximately 20 employees in each micro enterprise. However, in commerce and service sectors, the number of employed personnel is only 5 workers per enterprise. In exceptional cases, SMEs in the manufacturing sector can employ up to 200 workers, whereas those in the service sector can employ up to 50 workers. The capital of basic SMEs is only 18 million New Taiwan Dollar (NTD). Last year (2004), the revenue generated by the service sector amounted to NTD 100 millions.

This diagram shows the future Industrial development of Taiwan. The shares of manufacturing and technology industries are very significant. According to our industrial strategy, we want to develop local and creative industries including chain store systems. A so-called smart model has been set up for this purpose.

Every region in Taiwan is implementing relevant measures to promote its SMEs by creating an appropriate and healthy business environment that is beneficial to the development of new and existing SMEs. We want to enhance SMEs information technology capabilities, strengthen SME management guidance function, integrate the SME financial mechanism and build a platform for start-up and incubation.

This chart shows the responsibilities of our five divisions of the Small and Medium Enterprises Administration (SMEA). There exist twelve SME guidance systems at the Ministry of Economy Affairs. These mechanism or guidance systems deal with pollution prevention, production technology, industrial safety and R&D. This diagram shows the work of the Industrial Development Bureau under the Ministry of Economy Affairs. The Department of Commerce is responsible for domestic marketing, whereas the Bureau of Foreign Trade is in charge of international marketing. SMEA is in charge of mutual assistance and collaboration, information management, finance, quality upgrading and management. This diagram shows our eleven-guidance system. This chart shows our new system named Start up and incubation guidance system. I work at this Start Up and Incubation Division. My responsibility is to promote the guidance system. There are currently twelve systems.

A strategy was set up to develop and promote local specialty industries. There are four components in this strategy: (1) establishing a steering group on guidance and assistance, (2) integrating public sector resources, (3) promoting local business owner's participation, and (4) integrating private sector resources. The objectives of the said strategy are to design networking innovative promotion, to enhance local industries' capacity and organization development and to improve local image identification.

On 21 September 1999 an earthquake hit Taiwan. This earthquake, which is called 921 Earthquake, is one of the biggest natural disaster ever occurred in our country. In terms of human casualties, 2,494 people were found dead and 11,305 people were injured. More than 51,962 major buildings and more than 54,332 moderate buildings were damaged. The total economic impact amounted to NTD 11.5 billion.

These are some photos of casualties and damages caused by the 921 Earthquake. Next, I will talk about the government related policies. When the natural disaster or Earthquake occurred it was so serious. In order to rehabilitate the areas which were hit by the earthquake, related policies were laid down by the government to (1) conserve natural resources and environment, (2) reduce the use of plastic bags, (3) promote garbage classification and products recycling, (4) prohibit excess cultivation in high mountain areas, and (5) promote tourism industry.

Further efforts are being made to (1) reduce the quantity of garbage, (2) reduce landslides, (3) protect original environment of high mountain areas, (4) maintain water quality and the

environment in mountainous areas, (5) reduce non-biodegradable substances, and (6) create value from the use of recycled resources.

Three environmental protection measures are currently implemented to reduce wastes, recycle wastes and create wastes value.

Several methods have been used to reduce wastes. This picture shows food made of the wastes of taro (Chinese potato). These are new products made of bamboo wastes. This one is made of disposed cans.

Regarding the wastes recycling measures, we may consider the application of recycled natural materials by (1) using recycled bamboo bowl, (2) using bamboo sections as rice bowl, (3) using tea dust to make cleaning bag, and (4) using bamboo charcoal wastes as absorbents. These are some photos of recycled bamboo bowls.

Handicrafts can also be made of wastes. The purpose is to add value to wastes. We use wastes to produce aluminum sculpture art works, wood and bamboo sculpture works. Bamboo wastes are recycled to produce dining utensils, cleaning bags, etc. These are some photos of the handicrafts made from recycled wastes materials. To promote the environmental conservation in local communities, the government has provided education and training programs to raise the people's awareness on the environmental protection and ecological conservation. Abandoned bamboo forests have been transformed into beautiful gardens. Local people can now enjoy clean and healthy environment.

I have conducted a research in two communities, namely Luke township and Jhushan township. These products, shown in the photos, are made of recycled materials.

Lastly, I would like to present a case study of a natural dye made from plant in Jhongliao province. "Happy Colors at My Hometown", said Dr. Sun-Qiaie, Director of the National Taiwan Craft Research Institute. Jhongliao is situated in Northwestern Nantou, with the area of 14,665 square kilometers. The province is blessed by picturesque mountainous landscape and pleasant climate, making it an ideal place for recreation and outdoor activities. Jhongliao is also well known for its agriculture. But due to its isolation, it is barely visited.

After the 921 Earthquake, a workshop called 'Adroit Plant Dyeing' was established by a group of Jhongliao mothers led by Shu-Zhen Hwang, a teacher from the National Taiwan Crafts Institute.

The Small and Medium Enterprises Administration (MOEA) has set up in Jhongliao the Local Industry and Economy Advancing Association to help develop local specialty industries by providing counseling programs to the dyeing enterprises. The initiative is to make sure that these local enterprises which produce 100% natural dyes are able to operate smoothly. A project named **‘one target, two strategies and six programs’** was also set up to run the entire process. The target is to develop the dying business into a local specialty industry. The strategy is composed of **‘Resource Input’** and **‘Achievement Output’**.

This diagram shows the strategy of Resource Input. Here is the Result Output Strategy.

Lastly, I would like to talk about the government’s **‘Healthy Community Six-Star Plan’**. The plan includes six aspects, namely community security, social welfare and medical care, environmental and ecology protection, environmental scenery and tourism, education of humanities and local industry development. The Ministry of Economical Affairs is in charge of local industry development in this plan. Our divisions are responsible for the annual program entitled *‘Dream to Create New Business’* and the mechanism of incubators.

A forum of incubators was organized for the second time last March in Taipei. The third forum will be organized in Korea later this year. For further information concerning the development of incubators, please contact me at my office or at [ryhuang@moeasmea.gov.tw](mailto:ryhuang@moeasmea.gov.tw). Thank you.

**Dr. Wichai Turongpand:**

Thank you very much, Dr. Huang for your presentation and the environmentally friendly products you have brought from Taiwan. We can take a look at them and appreciate the progress of Taiwanese technology in the field of the environmental protection.

The next session is reserved for questions and answers. May I invite the participants from Chiang Mai and Nan provinces to ask questions first. Khun Sudarat? Are you in this room? I think you probably have a lot of questions to share with us. You may identify yourself and ask your questions. Please point the questions directly to the speaker that you want to ask.

**Mrs. Sudarat from Tonpao, Chiang Mai:**

*(\*Translator)*

If we have materials or products to export and the importing countries require only quality products and raw materials, can they help us improve the quality of our raw materials?

**Dr. Wichai Turongpand:**

The processing of raw materials, which takes place in Thailand, produces wastes and environmental pollution. What are the responsibilities of our foreign trade partners?

**Dr. Huang:**

Well, from my point of view and my experience in Taiwan, SMEs lack technology, information, and financial resources. Therefore, it is necessary that the government assists the SMEs in solving this problem. As I already mentioned in my presentation, there are a twelve guidance systems in Taiwan which help SMEs deal with the question of raw materials. Regarding the pollution problem, the government has to play a leading role in assisting SMEs and new businesses.

**Dr. Wichai Turongpand:**

I would like to invite Mr. Shimizu to help us answer this question. Let me repeat the question again. When pollution occurs at the first stage of production, what are the responsibilities of the importers towards the producers?

**Mr. Shimizu:**

Japan has its regulations. When they import products from other countries, they have to get the approval of the products. I think this approval is substituted for the responsibility.

**Dr. Wichai:**

I think what Khun Sudarat is trying to say is that Japanese firms, import mulberry paper from Baan Ton Pao and let the community deal with the pollution and other environmental problems. The mulberry paper in question will be used as raw material by Japanese

manufacturers to produce finished products. What are the responsibilities of these Japanese manufacturers towards Thailand in the matter of environmental protection.

**Mr. Shimizu:**

Well, maybe all Japanese producers have their own responsibilities. However, they cannot accuse the producers in Thailand. But I can say that in the United States, American importers can be accused of supplying this kind of products. The Japanese regulations are not as strict as those in the US. So when you export products to the US, you should be careful.

**Dr. Wichai:**

This is the reason why I have invited Mr. Shimizu to give a lecture on the Japanese best practice so that Thailand can learn from it.

**Audience 2:**

*(\*Translator)*

Good afternoon. My name is Kaset Yosaboonreung. I am Chief of Na-Noi Sub-district in Naan Province. Nowadays, the destruction of our forests and the pollution of the environment in our community are caused by people outside the community, not by the local people. How can we solve this problem? We have a lot of raw materials in our sub-district, for instance bamboo. We use bamboo for food, and to produce chopsticks which are exported to Taiwan. I would like to learn more about environmental management at the community level. What measures can be taken by our community to help protect the environment? What lessons can we learn from Taiwan and other developed countries? I would like to ask Dr. Huang who has explained us about the Taiwanese case.

**Dr. Wichai Turongpand:**

Dr. Huang, would you like to answer this question?

**Dr. Huang:**

Regarding the external cause of environmental destruction, it is indeed very difficult to solve this kind of problem. The authorities and the people in the community should get together

to brainstorm the problem and try to find out an acceptable solution. In the globalization, there exist international standards, which we have to respect.

Concerning the use of bamboos, Taiwanese industries employ nanotechnology to develop a series of new products from the wastes of bamboo, thus contributing to the protection of the environment.

It is also crucial to create innovative products by using new technologies. Highly innovative bamboo products can be exported to countries like Japan. Traditional products require new designs or new functions. We will learn more how to improve our environment this way. Thanks.

**Dr. Wichai Turongpand:**

It is important to integrate the environmental issue into the management system. People in the community should discuss relevant rules and strategies. They should agree upon a set of environmental standards to be used within the community. It is necessary to instill environmental awareness among the local people. A local ‘watchdog’ on environmental conservation should be set up to ensure that all related regulations are properly implemented.

**Mr. Varampath:**

I would like to tell an interesting and real story which occurred in India. Coca Cola came to a village in Southern India to establish its factory there. It was a very big plant that produces about million bottles a day. To make Coca Cola, the factory had to take all the water which was used in the village. The factory failed to provide water for public use. It was a very unhappy situation for the villagers. So all of them decided to form a people army and went on to close the factory. At the same time, the case was filed at the High Court against the company. Within the month, the plant was closed. This was the initiative of a very small village in Southern India. As Prof. Yunus said in the morning, it is all in the mind. We can make anything happen.

**Audience 3:**

*(\*Translator)*

We talk about managing the environment for SMEs industry. We need to understand this very clearly about how we are going to implement this because it is about protection, not about

mitigating. You can see from all things that we have been listening to from the morning that there are various case studies about textiles, dyeing and plating. It is very important that you need to gather the information because every industry will have to look at itself and consider how they are going to solve the problem and gather all the information. We have to take this matter into our hands. I have been working in a noodle plant. Some noodle plants dispose the wastewater to the environmental system, creating pollution.

About the second point, I think there are two perspectives. I think we talked about the efficient production but never talked about the consumption. Sustainable consumption, I have already shown you some of the slides. We are now able to produce goods so efficiently. What I am not sure about the slide is whether the biggest industry is just about an advertisement. You have to sell more. They have got the mobiles and they have got the TV spotter. So I would like you to think about what 'sustainable' means.

The third point is about networking. We have been talking all day and we can see that there are many networks; such as the Asia Pacific network that organizes the forum every year talking about how we are going to produce goods efficiently and cleanly in Australia, I think, about 6 times. The forum was then held in Kuala Lumpur and Bangkok.

I think we can exchange ideas about the service industry and share our experiences. If you look at the websites, you can see much progress. All of this information is from good networks on which we need to capitalize because it really helps us.

Lastly, everybody is interested in green products. Now the Federation of Thai Investors is going to organize an international conference which will display the products that have good impact on the environment. It will be held on 6-9 October in Thailand at Muang Thong Thani. So I think this maybe the place where you probably will be able to promote green products. Now we have been listening to a lot of things and it is time for you to learn and teach yourself. Thank you very much.

*(\*Translator: F)*

What you said is based on your information but my question is how we can prevent the problem. We said we had to walk on our feet. I walk on my feet all the time and I win all the time. But I would like to ask about those experiences that you get by walking with your brain and information. If you go to my sub-district, we consume information about life from dawn to

dusk, daily monthly and yearly. The community plan will be submitted to the Sub-district administrative organization. If the plan has been proved successful at the sub-district level, it will be included in the government's planning at the provincial level. This is what we have been doing all the time. But my question is how we can protect ourselves from multinationals and hypermarket chains, such as Macro and Lotus which invade our community.

**Dr. Chaiyod Bunyagidj:**

I would like to answer this question. The problem can be solved at various levels. If people want to do it by themselves, they can follow the example of Southern India where villagers managed to close down the Coca Cola plant. This is one way to deal with the problem. But if people cannot do it by themselves like that, I think they might have to form a networking. It is not easy despite the fact that there exists good media to voice our concerns. For example, an old lady was protesting for over ten years against the government that had expropriated her land. She used the media to publicize her case and win the public support. This is another way to deal with it. As you see, there are so many ways we can do but first we have to use our brain before we use our feet.

**Audience 4:**

*(\*Translator)*

My name is Vimol. I am City-Clerk of Bann Ton Pao where mulberry paper is produced. Thanks to the government's policy on poverty eradication and the promotion of SMEs, the income of Baan Ton Pao community has augmented, and the export of its mulberry paper increased by 80%. There was no unemployment, and the income distribution was equitable. However, the government seemed to forget something. It was the environmental prevention. Paper mills generate wastewater, causing water pollution. The small entrepreneurs in our community are aware of this problem, but lack knowledge and appropriate technologies.

I would like to ask Mr. Varampath from India about the registration of chemicals and information concerning the risks towards the environment which are contained in those chemicals. Do you think that the producers of these chemicals will comply with this regulation?

I have a question for Mr. Shimizu. Most of the pulp produced in Baan Ton Pao is imported to Japan. As you know, both the pulping and bleaching processes are very polluting.

That is why Japan does not have wastewater problem, whereas Thailand is now facing this problem. Can Japan provide us with appropriate waste management technologies? Thank you.

**Mr. Shimizu:**

I am not a specialist in this field. Major pulping companies in Thailand have very good water treatment facilities. I suggest you to learn from these companies in your country first. This afternoon, I talked to a professor of Chiang Mai University and I suggested him to ask

They may have some ideas. The final approach is to have specialists sent from Japan. But I am afraid that this kind of water treatment does not exist any longer in Japan. I will have to check when I go back to Japan.

**Dr. Apichai Puntasen:**

Wastewater can be bio-digested by trees. Therefore we should plant lots of trees. All technologies have their limitations. Shrimp-farming activities generate wastes which pollute the water. We should strike a right balance between the production capacity on the one hand and the environment's bio-digestive and bio-degradable capacity on the other hand. In other words, we should not overstretch the natural capacity of the environment to accommodate our production facilities. Besides, we should not over consume and might think of other consumption patterns.

It is true that we have to depend on technology. But at the same time, I think, like Professor Yunus said, initiatives and final decisions should come from the people themselves. Academics and technicians should not monopolize the solutions. Their role is to provide relevant information and ideas. Sometimes we depend on other people just because we neglect our own potential. Actually, we have the potential. Concerning the question about the Japanese import of Thai mulberry paper and the pollution problem in Thailand which is caused by the paper industry, I think the Thai manufacturers may have to increase their export price to accommodate the social costs. At present, these hidden social costs are not calculated or included in the selling price. That is why Thai products are very cheap.

**Dr. Wichai Turongpand:**

I have a question about how to deal with market competition that have negative effects on the environment.

**Audience 5:**

*(\*Translator)*

My name is Napong Sanguan-napaporn. I come from the SMEs Northern Region Centre, Chiang Mai Province. I would like to share a little bit of my experience with you. The effects of the globalization on trade and environment are of great concern to the people in our center. The question of free trade and its impacts on local SMEs are preoccupying small producers and manufacturers in the community. The situation is forcing the people to work separately and compete with each other. The environmental issue is becoming more and more important. Right now, buyers will not only look for the quality of a product, but will also investigate both the environmental impact and environmental management of its production. Employees' incomes and welfare as well as their working conditions are also taken into consideration. These are key factors which will determine the quality and the price of the product. Prices and products standards have to be negotiated. There are winners and losers in every negotiation. Those who have more power will put pressure on the weaker ones. Somebody has asked whether Japan should take a responsibility for the wastewater produced by the Thai paper mills. I think trade should not only be free but also fair. I took my products to a trade fair in Germany. If I left a box there, I would have to pay for the disposal of the box. But in our country, if someone throws a box in front of our house, somebody may take it. When I talk about free trade or about environment, it is not only somebody's issue, but an issue that affects everyone and every country. Today's forum is the APEC forum. I think all the governments concerned should have a closer cooperation in this field. Bilateral trade is conducted in compliance with trade agreements and agreed responsibilities. Responsibilities make free trade a fair trade. I believe the question concerning the responsibilities should be discussed between government and government. This is a crucial problem. After all, it is not only a matter of promoting businesses or improving GDP. It is, in fact, the development issue, which is at stake. Unless the objective is clear, we cannot find the solution. Thank you very much.

**Dr. Wichai Turongpand :**

To summarize, there are three points which can be used as recommendations for our future cooperation. First, 'networking' should be strengthened to improve the understanding of environmental sustainability.

Second, in the case of Thailand, the Office of Small and Medium Enterprises should set up a forum for SMEs to exchange ideas and promote activities relating to environmental management. Third, environmental management for SMEs should be included as an important agenda in all APEC meetings such as the ministerial meeting in Korea to be held in October.

**MC (F):**

Thank you very much, Dr. Wichai. We now come to the end of our seminar. May I invite Mrs. Nitnirun Suwannagate, Advisor of the Office of the SME Promotion to close the seminar.

**Mrs. Nitnirun:**

Dr. Suthawan Sathirathai, President of the Good Governance for Social Development and Environment Institute, Professor Dr. Apichai Puntasen, Director of the Rural and Social Management Institute, the Foundation for Thailand Rural Reconstruction Movement under the Royal Patronage, Distinguished participants and guests, ladies and gentlemen,

On behalf of the office of SME promotion, I would like to express my most sincere thanks to all who have participated in today's important seminar on Environmental Management for APEC Micro-Enterprises towards Sustainable Development.

This is a very interesting topic and we have learned from many countries' experiences in promoting small and medium-sized entrepreneurs to improve their production lines that are sustainable and environmentally friendly. And even better, we have gained a plenty of thoughtful and insightful ideas, suggestions and comments from several well-respected experts. Some have given us very exciting macro pictures of their national policies on environmental protection while others have given us very useful and interesting cases of problems and solutions as well as successful improvements. This seminar has produced a very interesting set of ideas and suggestions. Our work and discussion today will be conveyed to the Office of SME Promotion and to the conference of the APEC SME 2005 in late August in South Korea. It has been a long and hard-working day for all of us. Nevertheless, I am certain that everyone agrees that it is

worth our time and effort. Right now, on behalf of the Office of SME Promotion, I would like to close this seminar.

But before we leave, there are some small gifts that I would like to present to our speakers as a token of our appreciation for their precious contribution.

**MC (F):**

May I now invite my Advisor to present the gifts to our speakers and our moderator.

Dr. Wichai Durongpand,

Mr. Quarch Huy Thong,

Mr. Abraham Varampath,

and Dr. Ren-Yow Huang.

Tonight, our guests are cordially invited to a luxurious dinner cruise on the Chao Praya River. The meeting time is 6.30 p.m. at the hotel port.

On behalf of the Office of SME Promotion and the Good Governance for Social Development and Environment Institute, I would like to thank you for participating in today's seminar. Good bye and have a good trip back home. Thank you very much.

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