

Panel Discussion

"Eco-Industrial Clusters Leading to Sustainable Local Development of Asia"

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(All titles and honorifics omitted below)

Gunjima

Let's start this discussion on the themes addressed by the panelists today.

I think you noticed that what have been promoted as Eco Towns in Japan are somewhat different from the eco-industrial clusters typically found in Asia.

The projects that have been widely promoted in the past include those based on the concept of Zero Emission, advocated primarily by Gunter Pauli of the United Nations University and projects based on the concept of symbiosis, like the one pursued in Kalundborg, Denmark, which are attempts to vitalize industries while lowering environmental impact by networking industries metabolically. In addition, you

have probably heard about eco-industrial parks in advanced countries, represented by new recycling parks built in both brown and green fields. These concepts sought to find ways to locate industrial facilities, while trying to reconcile, from the viewpoint of the environment and economy, the industrial development in advanced economies and the negative environmental impact produced by them.

Among East Asian countries, Japan pursues the Eco Town concept and China has witnessed an evolution from the clean production concept to the circulating economy concept. This has been followed by the concept of minor, middle and major circulations, whereby the minor circulation represents corporate-

based efforts to lower environmental impacts, the middle circulation is achievable typically through recycling parks and the major cycle encompasses the city as a living organism, inclusive of local communities. South Korea is also pursuing the development of recycling parks.

With such trends in the backdrop, the presentations today covered the issue of eco-industrial cluster development, as pursued in different parts of Asia. Among primary industries, the presentations covered forestry in Japan, rice production in Thailand, fishing in Vietnam and sericulture in India. The recent trend of population movement from rural/mountainous areas to urban areas needs to be countered by the creation of employment or development to be balanced among all of these areas. This requires the formation of eco-industrial clusters that are inclusive of primary industries such as agriculture, forestry and fishing.



The movement of the rural population to cities, driven by the creation of employment, increases the environmental impact on these areas. Therefore, we need to pay a little more attention to issues around the social structure, like the one mentioned with reference to India, as we focus on the issue of employment. While people often discuss the compatibility between the environment and economy, Mr. Anbumozhi, in an earlier presentation, discussed it in terms of environment, economy and social equity. In other words, our aim is to harmonize the three aspects of environment, economy and society. From this viewpoint, recent developments in some parts of Asia ap-

pear to have departed a little from the concept of industrial clusters, as advocated in the past.

As the first step in evaluating the seeds buried in the Asian versions of industrial clusters, Mr. Anbumozhi conducted a SWOP analysis. He presented the results of his analysis in different cases, identifying the strengths, weaknesses, opportunities and potential of these initiatives in different sets of realities. Apart from these examples from other parts of Asia, the project in Maniwa, Japan, seems to clearly represent a new concept in Eco Towns in an advanced country. I believe that the workshop today has presented an opportunity to ponder how we should evaluate the emergence of such new initiatives in Asia, or how we may help them grow by combining our efforts and by exchanging views.

During the discussion, we will look at different factors, one by one, that contribute to the growth of eco-industrial clusters while referring to different cases. We have already received questions from the audience, which will be addressed in the course of the discussion.

Of the panelists on stage, Mr. Shibusawa has not yet made a presentation. I would like to invite him to give his presentation now, which may take as long as ten minutes. Please go ahead Mr. Shibusawa.

Shibusawa

As an NGO representative, I have been involved in the Maniwa project mentioned in an earlier presentation, for about seven years. Before that, I was a corporate manager and prior to that, I taught agriculture technologies in South America as a specialist from the Japan International Cooperation Agency (JICA). I accepted an invitation to this event today believing that I was expected to provide commentary from the standpoint of NGOs, given my working experience for a number of years in developing countries.

While listening to your presentations, I was very encouraged to learn that, as mentioned by Mr. Gunjima, initiatives for building society while reconciling

ecology and economy have already been progressing in various parts of Asia. Personally, I am not quite sure what types of comments are required from me, but there is one thing I can say in connection with an earlier comment from Mr. Gunjima: namely that eco-industrial clusters (EICs) in other parts of Asia differ from Eco Towns in Japan. In this regard, I wish to present some comparative examples, so that you may better understand what these EICs really are.

One such example could be the oil palm plantation in Malaysia. Is it a type of EIC? The plantation industry is located in rural areas or in urban-rural fringe areas and procures raw products from these areas. The industry procures cheap labor from the local population and we find a clustering of technologies. We also find a clustering of different industrial facilities, such as processing facilities, processing plants and compost plants in the environment.

Because corporate social responsibility (CSR) has been emphasized globally in recent years, this industry has attracted considerable investments from companies, which strive to produce an image of being a company that utilizes resources in a manner far more conscious of the environment than in the past by adopting a recycling system that is friendly to the environment. Nevertheless, I don't think that this plantation industry can be categorized as an EIC. This is because, as you may have noticed, the effort towards formation of a local community is missing. We find relationships only between corporations and the laborers hired by them. As Mr. Anbumozhi explained earlier by using an illustration, the importance of the last part of the process, that is to say, the equitable distribution of wealth is ignored. The system is such that profit is accumulated by the companies that run the plantation business.

As another example, let us examine the case of Toyota City in Japan. Does Toyota City comprise an EIC? With this question in mind, we notice firstly that Toyota City is located in an urban-rural fringe area. The city is the home of the Toyota Corporation,

a global giant in the automobile industry, around which we see a cluster of its subcontractor's plants and other related industrial organizations. This area could be foremost in the world in terms of the level of technological clustering. Obviously, the presence of the industries has been approved by the parties involved. Toyota's corporate management is very conscious of the environment and the company is very much involved in environmental conservation. The Toyota City Government, for the first time in Japan, has introduced an environment tax, of which one percent of the water rates paid by residents is fed back to the maintenance of the forests upstream of the city.

So, is Toyota City an EIC? In my opinion, probably not. This reasoning is based on my view that the most important consideration for Toyota City is the automobile industry built around the Toyota Corporation and that, in principle, a higher priority is attached to the decisions made by the Toyota Corporation than to the decisions made by the citizens. You may say that this is not so, but basically the citizens of Toyota City cannot be major stakeholders in the Toyota Corporation. Major stakeholders in the Toyota Corporation are its worldwide shareholders and consumers who buy Toyota-brand cars.

From this viewpoint, neither Toyota nor the oil palm plantation industry constitutes an EIC. So, what is an EIC? What is the essence of an EIC that is lacking in the two cases I have mentioned? It is the community. In an earlier presentation, Mr. Nagendran from India explained the concept of gender and social capital. These are the exact aspects that I would like to emphasize.

Earlier, Mr. Anbumozhi presented a slide that showed two circles of stakeholders. In the case of Maniwa, the local community is at the exact center of the inner circle of stakeholders. Mr. Nakashima, despite being a corporate manager, acts basically as one of the citizens of the local community. People like him, who are corporate managers and local community members at the same time, formed the core and

began to create a cluster. Subsequently, people from outside began to support it. This is how we see the Maniwa model.

In future, when starting to develop a cluster in one of the semi-mountainous regions of Japan or in the context of social development in a developing country, one naturally needs to have a clear vision of the direction of growth to be pursued by the community. We believed for a long time that a clear vision for Japan was a vision of economic growth. In the 20th century, Japan did grow according to that vision. Presently, however, we are finally beginning to notice that the vision had errors, or that it should not be the only vision.



In an attempt to emphasize what Maniwa represents, I mention that the project started from an initiative to foster pride in living in the area. This pride is based on an awareness, held by the local people as they raise their children while they live in the area, that the energy they use is replenished by trees in local forests, an awareness that the agricultural products they eat are from local farmlands and an awareness that they are able to procure materials and energy in a manner more cost-effective than purchasing petroleum. I believe that the problem is the same with similar initiatives in other parts of Asia. As I see it, when people pursue the development of a cluster like this, the largest stakeholder and an integral part of the project is the local community, that is to say, people living in the area.

What constitutes the happiness of people in the lo-

cal community? Economic wealth cannot be the sole ingredient of their happiness. In the past, as I involved myself in several development projects in Asia, I have seen that pursuing a project with the sole aim of economic wealth and economic efficiency would finally result in the formation of a group of people within the community who profited tremendously and a group of people who did not profit at all. This gradually brings inequality and discrimination to what used to be a harmonious community. To say more about this, I have seen a large amount of money flow into a community that used to thrive on the basis of self-sufficiency. The inflow of capital changes the community's sense of values. I have seen many villages in which the community has become unsustainable because of this. When forming a new industrial cluster, we should never repeat this mistake.

How should we combine the initiatives of local citizens based on awareness that the formation of a cluster will improve the environment, produce economic benefits and enhance pride in living and raising children in the area? In a sense, this should be achieved through education. In another sense, this should be achieved by an emphasis on welfare in the context of strengthening connections between different generations. I believe that the key to the success of these initiatives in the future lies in how we may pursue such community-building activities in parallel to the development of a cluster. However, even if a cluster might have succeeded economically and environmentally, a corporate-centered approach is prone to failure because corporations are looking for a place of business that is more profitable. If it is more profitable to form a cluster in Indonesia than in Vietnam, for example, corporations will move out of Vietnam. After that, nothing is left. The local people are abandoned.

In avoiding this pattern, how can we develop an industrial cluster and local community simultaneously in the context of society at large, while addressing the related issues such as the gender issue mentioned earlier? This process will take time, as has been pointed

out several times today. In trying to build consensus within the local community and in trying to ensure that the given locality will thrive in a sustainable manner with support from people in other localities or countries, a very important theme is how we might share. In the next 50 years, the world's population will reach 10 billion. In this age, how can we share, how can we be compassionate to others? A local community, when trying to develop an eco-industrial cluster, should be aware of these questions that concern human mentality. This, I believe, is most crucial to the success of a cluster. This, at the same time, should be an area in which an NGO like ours makes contributions.

Gunjima

Thank you very much. As pointed out earlier by Mr. Anbumozhi, we need to look at EICs from a viewpoint inclusive of the three factors, namely, environment, economy and society. For too long, in the EU and elsewhere, the primary industries have been identified as a significant source of environmental disruption. While it concerns issues of sanitation as well, I think that we have a better understanding of the issues of pollution and waste being produced by the primary industries.

Now I would like to hear responses to the comments made by Mr. Shibusawa. The importance of looking at the matter in terms of the three aspects of environment, economy and society has been emphasized by Mr. Nagendran with reference to the issue of gender in India. Mr. Nagendran, would you like to comment?

Nagendran

Thank you Chairman. At the outset, I would like to mention that Dr. Shibusawa's comments were absolutely pertinent in the context of developing EIC. As he put it right, when we improve economically, we should not forget the people because after all it is the economy of the people. In the context of EIC for seri-

culture in India, his comments are absolutely important to give the proper direction, because unless the people are taken with us, clusters will not be created. If we economically cluster people instead of clustering socially, there may be dispersion of people later on. In this context, I think his comments are absolutely essential to be considered in the next phase, as we keep his comments in mind to go ahead in our journey to establish EIC.

Gunjima

Thank you very much.

Mr. Visvanathan from Thailand, may we hear what you think?

Visvanathan

Thank you very much Mr. Chairman. I do agree very well with what was said about it. It is not only the community participation. We need to have the community participation, and that is one of the reasons in the Thailand case study we tried to promote decentralized systems. When we talk about power productions or biogas generation, the normal trend is to have big plants because people run on the economy of the scale. These types of projects are viable when you have big projects. But if you want to have clusters, it is important to not only look at the economy of the scale, but also the decentralized systems, developing viable technology for the systems, so that the community can take a leadership role. This is what we were talking about; developing technology or transferring technology to a community level where systems can be operated at a decentralized level. Community holds the ownership, takes the pride, and also the share of the profit, not somebody else, that is very important. Thank you.

Gunjima

Thank you very much.

Ms. Van Ha from Vietnam, may we hear your comments?

Van Ha

I have a short comment although we already had agreement with the comment on policies because finally the local community, in our case the fish farmers, will be the one to benefit most by the industrial clusters. So now the people are already aware a little bit, but I think we have to make a lot of effort to increase the awareness of the local community. Thank you.

Gunjima

Thank you very much. The importance of building consensus in the community concerns the importance of building social capital, a capital in the form of social relationships, according to the words of Mr. Anbumozhi. Mr. Anbumozhi, would you like to share your ideas on this?

Anbumozhi

I agree with Dr. Shibusawa's observation about the social capital and the community building skills. Actually, I had been to all these four clusters and spent a week there, and interacted with business people in Maniwa. I found that Maniwa has some kind of model to deliver to developing Asia in terms of social capital. What is social capital in right terms? It is kind of dealing with the institutions and also the individuals. It includes the institutions, the individuals, their relationship, their values, their values attached to the environment and also their attitudes that govern these interactions. That is a very important and unique aspect observed in Maniwa. They started in 1992 as "Maniwa Juku" and it took nearly eight years to be translated into social development or the economic development process.

Actually in that process, there are three steps. One is the trust, building the trust among the companies and the community. Then, the next step is to take some kind of collective actions or agreeing with the common points on where to start, when to start. This later transformed into a collective action of this eco-

friendly cluster or creations. So social capital becomes the necessary condition for building an eco-industrial cluster in any part of the world. Thank you.

Gunjima

Thank you very much. All the panelists seem to agree on the point that one of the visions connected to the formation of an EIC should be the harmonization of the three aspects of environment, economy and society.

Now, let us address one of the questions from the audience. This is a rather basic question, submitted by a person from JICA: "While I understand that EICs are designed from the viewpoint of utilizing waste, isn't it true that the process of waste utilization involves the issue of secondary pollution?" The questioner hopes to hear from all the panelists. I would like to know if the panelists have found or dealt with such an issue in their research or experience. Mr. Nakashima, may we hear your comments first?

Nakashima

We specialize in log processing and there are many people in the district who are engaged in this. Since trees cannot be utilized as they stand in the mountains, we cut them down and transport the logs to lumber mills. Log processing produces a lot of waste wood. Bark and wood shavings produced in the bark stripping process are currently regarded as industrial waste in Japan. Many people in our area must have them collected by an industrial waste service company and pay for this. Among all the advanced and developing countries of the world, Japan may be the only country that regards bark as industrial waste.

Forestry-based timber industries thrive in Europe, the United States and Canada. In these countries, there is a system of utilizing almost all wood waste as fuel. Given this fact, why has wood wastes come to be regarded as industrial wastes in Japan? In the past, the Japanese used to utilize wood completely. However, from around 1980, which we now see as the bub-

ble economy period, the price of timber in Japan rose steeply, which caused us to neglect quality and utilizing by-products fully. In other words, business could continue in economic terms even in the absence of these being used as products. An attitude of discarding bark as waste rather than taking the trouble to use it seems to be the attitude that has prevailed since the 1980s.

Fortunately, wood waste is unlikely to produce harmful secondary pollutants, even when it is burned, or to constitute a bulky load. There are many ways of utilizing wood waste besides using it as fuel. The choice between regarding these products as waste and establishing a system that values them correctly along with major wood products, makes a great difference. I believe that the absence of such a system has harmed the evaluation of wood itself in Japan, where the price of cedar and Japanese larch logs are the lowest in the world.

Gunjima

Thank you very much.

Mr. Visvanathan, would you like to say something?

Visvanathan

I tend to slightly disagree with this statement. I do not think that EICs have to depend only on reutilization of waste. If so, EICs will depend on how much waste you generate. What EIC should do is to try and find out an alternative use for the waste. I think it should not be developed primarily for reutilization of waste. That is the belief for nothing. Now when you use these ways, it will create secondary problems as I said in this case. When you are trying to use a decentralized system of converting agriculture residue to biomass, there could be a problem related to air pollution and we have to look into the problem. When we talk about converting piggery waste to an anaerobic digester, we are converting the organic fractions into the methane part, and the digested wastes will contain large amount of nitrogen that we need to take care of.



When you are moving from one problem to another, we are surely going to create another problem. Certainly you have to look at it in a holistic approach. That is important. Thank you.

Gunjima

Ms. Van Ha, what is your opinion? You have valued the potential of EICs, to significantly lower environmental impact, highly. What do you say about the view expressed by the person from JICA?

Van Ha

For EIC, one of the very important objectives is to minimize the waste. Keeping it in mind, in our cluster we try to minimize the mess by reusing and recycling all of the waste we generate. One of the problems derived from byproduct that we use to treat fish. Bones and skins are to produce the fish powder, which is used for the animal and fish feed. I agree in a part that we may create a new waste like in the case of fisheries, the risk is it could create large amount of wastewater and sludge from fishpond. That is why we gather here to try to continue to find a technology to minimize the impact. For example, we have to treat the sludge from fishpond to produce fertilizers. One of the important points is how we manage the wastewater from the fishpond, because the government already had the policy that in each area of fishponds 10% of the area should be kept to treat the wastewater before it is discharged into the environment. We always keep it in mind to minimize the waste, and if we

regenerate another kind of waste, we have to find a technology or find a way to minimize, to manage it. Thank you.

Gunjima

Mr. Nagendran, would you like to add something?

Nagendran

With reference to the sericulture industry, this comment that EIC issue of reprocessing the waste is not a direct problem. Because basically sericulture is not an un-eco-friendly industry, actually it is quite eco-friendly industry. The examples of the suggestions made or options available such as getting products from the waste are the dead silk moth and the silk-worm that are dead after the process. In the context of EIC, we would be approaching not from the perspective of value addition due to reprocessing or secondary environmental problems, but from value capture out of something which has not been used at all. It is something new which has not been attempted in India, but it is a very important point that we have to consider. When we suggest something, we should see what is going to happen to the environment. And so EIC, in our opinion, should follow the principle of prevent and prepare rather than repent and repair later on. So this should be the approach of EIC. Thank you.

Gunjima

Thank you very much.

I think that we have formed a general understanding of the concept of the three visions connected with EICs.

Next, a member from the audience asked if excessive focus on the development of an EIC might not result in neglecting the main line of business. The questioner, addressing Mr. Nakashima, has asked: "While I understand that the project is pertinent to Meiken Lamwood Corporation, is the Maniwa community not seeking to build an eco-industrial cluster without attending to the need of revitalizing forestry, which

should be the main line of business?" Mr. Nakashima, can you please comment?

Nakashima

I appreciate that this is a very good question. I think the questioner refers to the fact that our timber industry is based on forestry in Japan, which currently appears to be in very bad shape. I have just mentioned that the trading price of timber in Japan is the lowest in the world. According to an evaluation done in March this year, the value of cedar trees as they stand on a mountain is in the order of 3,000 yen per a square meter of land. I also mentioned that the timber price was at its highest in 1980. Then the trading price of timber was in the order of 25,000 yen, or greater. Thus, the price has gone down by a factor of about ten, and so, in reality, there remains only a little stock of timber left in the mountains.

With this background, in Japan generally and particularly in our locality too, the productivity of lumber mills has not improved much in the past 40 years. Looking at the statistics from Okayama Prefecture during the period from 1965 to 2004, the year before last, the production per capita in this industry has improved by a factor of only about 1.6. At timber production sites, typically in Europe, that use wood from man-made forests, productivity has improved by a factor of about ten. Even though high productivity is not our only goal, poor productivity certainly is one of the challenging issues.

Another issue is that we have not been making products with added value. In our locality and elsewhere, there is now a very large demand for strong high-performance timber and nail-less timber. In the face of such demands, the timber industry in Japan is not even capable of drying timber thoroughly. As far as I know, Japan is the only country in the world that uses petroleum-based fuels for drying timber. In all other countries, drying is done by using the heat of burning bark and wood shaving. Japan has so far not only failed to establish such a system but has also

abandoned its traditional ways of working.

At a lumber mill in Europe, the sales of by-products like chips for paper manufacturing, bark and shavings have a 20% share, on average, of total sales. In Japan, even at our lumber mill, this share is less than 3%. 3% is not a bad figure when compared to other lumber mills. Some lumber mills even have to pay to have these products disposed of as waste, in acceptance of an unreasonable criterion that labels them as waste. Since this is a matter basic to the industry, the presence or absence of the required infrastructure affects choice greatly. The options available for biomass utilization similarly differ between countries or regions that have established a system and countries or regions that have not. I believe that Japan is now in extremely bad shape concerning these matters.



The regions that are capable of establishing a good system of biomass utilization will survive and increase the value of trees grown in their mountains. The regions that cannot do this will have to remain as they are now. I believe that biomass utilization belongs to our main line of business and constitutes the very essence of our business.

Gunjima

Thank you very much. When developing an EIC, we must pay attention to different aspects of the undertaking: one is the technology, another is the human resources and the availability of experts and additionally, we must think about financing and the economic efficiency of a business built with collective

funds. Furthermore, there are issues around the formation of inter-firm networks, the lowering of environmental impact by such networks and the requirement of comprehensive policies.

In earlier presentations, there was mention of the fact that different ministries and agencies pursue their individual policies without integrating them. What could be missing for integrated policies to be pursued? Mr. Visvanathan from Thailand, would you like to comment on this?

Visvanathan

In terms of integrating policies with inter-firm networks, it is not done to a large extent, but I think there is a difficulty because the initiatives can come only between the industries if they are above medium or relatively large scale. It creates a contradiction when we are talking about bringing out inter-firm interactions into a smaller scale, trying to promote as an eco-industrial cluster. In order to do that, I think we need to start at a pretty low level, at the grass-root level. This level of integration is necessary, and it has to be looked into very carefully. Honestly, I do not have the experience at the moment, but it is one of the things we are trying to look at, how to bring out the inter-firm interaction, especially when they are working on a competitive environment. Thank you.

Gunjima

Mr. Shibusawa, you, as a representative of an NGO, may not see the need for such policies. Nevertheless, there is still the question of who should assume leadership in coordinating activities. From this viewpoint, could you say something about the question of whether integration of policies is required or not?

Shibusawa

I believe that the matter differs from case to case.

For example, I receive many queries from people in various parts of Japan asking from me advice on

how they might develop an industrial cluster around wood-based materials, like the one formed in Maniwa. When I was involved in the Maniwa project, I was simultaneously involved in projects in three other localities. I often wonder why Maniwa alone has developed while the three other localities have not succeeded. Generally in Japan, a project is initially led by the local community or by corporations that belong to the local community. This was the case, at least in Maniwa. The community was clearly aware of its goals and moreover, the community was capable of determining how much money and what type of measures, human resources and technology would be required for achieving these goals. Thus, the community planned for interaction with ministries and agencies according to their own assessment of the need for such connections: this year with the Ministry of Economy, Trade and Industry, the next year with the Ministry of Agriculture, Forestry and Fishery, the following year with the Okayama Prefectural Government and so on. This initiative in selecting partners distinguished Maniwa from other local communities.

In semi-mountainous regions in Japan, the reality is such that capable human resources are concentrated in administrative bodies or public offices. It is very rare for capable human resources to remain in the local community, particularly as corporate managers. I don't think that the Maniwa style is universally practicable. Nevertheless, we should note that the success of Maniwa, as evidenced today, is owed mostly to the fact that about ten years ago, prior to any administrative initiative or public policy, the local community formed a clear vision of how they would like to grow.

Gunjima

Thank you very much. In the earlier presentations, it was mentioned that eco-networking could be rather difficult in developing countries because of the absence of some technologies, or in other words, because of the presence of some missing links.

Ms. Van Ha from Vietnam, can you say something more about this? Later on, I would like to hear from Mr. Shibusawa as to what he thinks about the facilitation of eco-networking in terms of bottom-up efforts from citizen level rather than in terms of top-down policies.

Van Ha

In our case, first, I think on technology aspects, the enterprises or companies have to acquire the green technology they are using. And it is true that fish farmers need technologies used for clean production as well as advanced technologies in order to adapt the requirement from the international market. The second thing is that the technological innovation for reuse of waste is important. For, eg, if we cannot find a technological solution to transform fish waste into bio-fuels, then it will be very hard to move from industrial clusters to eco-industrial clusters.

Gunjima

Mr. Nagendran, would you like to say something?

Nagendran

About technology transfer with reference to sericulture, some of the options are getting pharmaceutical products, health product like chlorophyll, other chemical outputs like poly amino acids, and so on. They are really high technologies as far as this sector is concerned, and with the assistantship and guidelines from countries like Japan, it would go along way in developing not only this industry, but more and more small-scale and medium-scale entrepreneurs, who can use some byproduct from this industry, so that we can put this technology in place and produce more from the waste. In other words, what is considered as waste can be converted into wealth if technology transfer takes place in the right context. This is my view, and may I request the Chairman to kindly permit me to make one comment on integration of policy, please.

Gunjima

Yes, fine.

Nagendran

There was a question as to who should take the initiative. In our opinion, it is the promoter of EIC, that is, all of us, who should take the initiative, because in its present form the policies are not integrated or they are separated due to the lack of integration at the grassroots level. If EICs are realized, the promoters of EIC disseminate the point that these EICs are not just structural amenities or features but they are functional ecosystems. When the policy addresses ecosystem, it would become integrated on its own. This is my comment on integrating policy.



Gunjima

Mr. Shibusawa, would you like to say something about eco-networking?

Shibusawa

I would like to share my experience while adopting a different point of view.

Twenty-five years ago, when I was a university student, I formed an agricultural organization with my friends. We used to burn rice straw in the northern part of the Kanto area. It was a major source of pollution. We received complaints about the quantity of smoke we produced. Apart from that, cattle ranchers were confronted with the problem of how to dispose of feces and urine. Farms that were located in

the urban fringe area were receiving many complains about the odor.

We were collecting rice straw from farmers. Since unprocessed rice straw cannot be fed to cattle, we implanted catabolic enzymes in it to break up the substance called lignin in the rice straw. At the same time, we planted mushroom spores in the rice straw. By the time we harvested the mushrooms, the rice straw was ready to be fed to cattle after the lignin had broken down. Apart from that, we collected sawdust from a local lumber mill, which we placed under the cattle being fed on rice straw, to remove the odor from the excrement, from which we made manure.

Then, I established a company that specialized in growing earthworms. We made a great profit because the excrement of earthworms was priced very highly as a good fertilizer in the market at that time. After removing the earthworm excrement, the manure, including earthworms, was distributed to poultry farms as poultry feed. This also produced good profits because, at that time, native chickens that were raised in the area in a very free-range manner began to achieve a high market value in comparison to broilers from other poultry farms.

Finally, we formed a program that completed the cycle by returning the fowl droppings to farmers. Instead of paying the farmers for their transport of rice straw to our place, we gave out, at the end of the cycle, well-matured manure that included fowl droppings. In a sense, the idea was to form a cluster for efficient use of waste that the producers did not know how to dispose of.

This business failed after three years. The failure was due to a sudden drop in the price of beef. Then I really felt that the most prominent risk with such a cluster formation business was that a failure in one of the links would affect the entire business. Then I realized, as mentioned by others today, that when combining technologies to form an industrial cluster like this, we must ensure the involvement of some industries and technologies that are entirely different from the

original technology. In other words, we should always have bypass channels which we may use when another channel has failed.

However, creating such bypass channels naturally results in a loss of profitability. The given locality will obtain the maximum profit if it concentrates capital and labor in the field that is most profitable. However, the requirement of more than one bypass channel demands the parallel development of industries that are not quite as profitable. This dilemma invariably arises. The solution to this dilemma is the growing recognition in local communities for the need to create many bypass channels, a recognition based on a different sense of values. This is awareness that forming a cluster of industries may be a little less profitable than pursuing the growth of a single industry, but in the context of community building, the former is more valuable because it fosters trust relationships among local citizens, producing a milieu supportive of the education of children. Again, therefore, I would say that a project like this requires the synthesis not only of technologies but also of values.

Gunjima

Thank you very much. Producing an industrial portfolio and increasing diversity for segmenting the risk in forming a network certainly will have the drawback of reduced profitability.

Next, I invite Mr. Nakashima to respond to a question addressed to him: "What are the conditions that must be met for wood biomass power generation to be economically sustainable?"

Nakashima

Again, a good question. In 1984, we started biomass power generation on a 175kW scale. It was a very small facility with very good cost performance. In 1996, we decided to rebuild the present power plant, because the amount of wood shavings and bark produced by the factory had increased. We went to a bank to ask for finance. At the time the annual sales

of our company was less than five billion yen. We told the bank that we required a little more than a billion yen to build a power plant. They asked us what the annual return would be on the investment of a billion yen. When I told them that it would be around 30 million yen in terms of financial return, they objected to the plan, saying: "This is absurd. How can you complete the depreciation if a billion yen investment produces an annual return of only 30 million yen?"

Their statement was true in terms of financial return, but the situation then was such that unless we established a system for using up wood waste in an efficient manner, we would have to pay a lot of money for having it disposed of as industrial waste. I also explained to them that sooner or later, there would come a time when companies that have established a system for using up wood waste will be demanded by society. With these explanations, the bank finally accepted our request for finance.

As to how the power plant performs today, we are now able to, with the progress in depreciation, expect an annual return of about 200 million yen as income, in various visible formats. A 200 million yen return on a billion yen investment may sound quite ordinary. Nevertheless, this is run as a decent business because we have completed the depreciation.

The power plant we have now uses dry wood shavings as a major fuel. In terms of profitability as a business, I mention that the energy conversion efficiency into electricity at our facility using this type of fuel is quite poor. In terms of the generation efficiency, only 12-13% of the energy is transformed into electricity. With a somewhat larger plant, we can double the efficiency to about 25%. With that efficiency, the value of wood shavings can be improved from the present level of 9-10 yen to the level of about 20 yen. At a price of 20 yen, wood shavings are something very valuable that starts contributing significantly to the sales achieved by a lumber mill. Even with 20 yen pricing, wood shavings are still more cost-effective than petroleum. While there is an old story in Japan

about a problem being solved by three parties accepting an equal loss, this solution brings profit equally to all three parties involved. As industries are affected by increasing energy prices and impacted by restrictions on waste disposal, providing a decent means of dealing with such problems can constitute a business. I believe that the situation is such that the timber industry may become unsustainable if it is unable to make such contributions.

Gunjima

Thank you very much. Next, Mr. Anbumozhi, would you like to say something about funding in the general context of EIC development?

Anbumozhi

Actually I have two points to share. Just coming back to what Mr. Nakashima said, and that is financing and how do we finance these kinds of new eco-initiatives, which have inherent economic risks. Of course, we know that unfortunately this eco business or the environmental business is not in the main stream. We have to find new mechanism. Is there exist any operational models? Yes, some characteristics of microfinance programs, examples include Grameen Bank of Bangladesh or the self-help groups in India that can become a model. Micro-credit program for the micro-enterprises, that is financing the micro enterprises was not the mainstream, but this Grameen Bank in Bangladesh was successful in making it happen. So that kind of model can be considered for financing EICs, which essentially deals with small business.

How? How they did this, there are three steps in this. One is developing a group funding. First, these environmental-related companies, come together and they form group funding. Then they accelerate the savings, increasing the capital. The third step is promote a kind of internal lending, so they lend themselves. In the case of Grameen Bank, first, they went for internal savings followed by lending and

then they went for cooperation with banks to make borrowing from the financial institutions. In that case, NPOs has become some kind of intermediary between these self-help groups and the financial institutions. I believe that kind of model can also be applicable to environmental-related business. During this process, the pay back system is becoming flexible, and also it promotes the innovations. When micro-credit system shows flexibility, group of entrepreneurs operate their business on mutual collateral, then the system becomes more innovative. This is my point. Financial systems related to EIC can look for innovative models one among the appropriate ones is micro finance or the micro credit model.



My second point is policy integration. EIC is dealing with developing entrepreneurial business. It is very difficult to create EICs deliberately through single policy instrument. On the other hand, business can not operate in policy vacuum. Policies should promote and maintain the conditions that enable EICs to emerge. There are some successful stories, and in Thailand and Vietnam, we found that there exist favorable policy environment. But if analyzed in deep, policy integration is uncommon in the studied EICs. There is no single policy that promotes eco-industrial clusters in the rural-urban fringe areas. In Maniwa also it happened. Basically, I believe that there are three levels of policy integration. At the lower level, we can see the policy information or the policy cooperation. At this level, just exchange the information between sectoral institutions as that is happening

in Maniwa takes place, where the Ministry of Environment, Trade, and Industry, the Ministry of Agriculture and Forestry come together, just to share the information. The next step is the transparency in information sharing or the policy coordination. This should be done at the national level. This is usually done whenever new project comes up, and is carried out in the form of environmental impact assessment or sustainability assessment. By this process we try to avoid the policy conflicts. The third level is true policy integration. This is much needed for EIC as it is a cross-cutting area. It cross-cuts across the boundaries of traditional ministries, whether the Ministry of Environment or Ministry of Economy, or the Ministry of Agriculture and Forestry, or the Ministry of Industry. So what is essential is working together to unlock the synergies between sectoral policies. Maximization of the synergies among ministries or the two separate policies should be the aim of policy integration. That needs common goals and commitment to achieve it. For example, in Thailand, we talked about the technology transfer. If the Ministry of Industry has its policy against the import or the international transfer of technology, while the Ministry of Environment continues to promote uptake of energy technologies, then there is going to be a conflict, with no synergetic effect. So we need to think together, come together and work together both horizontally and vertically towards a joint goal that needs a commitment from each and every sectoral ministry. EIC initiatives have to cut across the operational policies of ministries as a common approach towards achieving a sustainable society or environmental sustainability. So, I believe this policy integration and the innovative financing system are important to have more functional eco-industrial clusters emerge. Thank you.

Gunjima

Thank you very much.

Ms. Van Ha, would you like to comment?

Van Ha

Can I have one comment? After my studies, I come to the question where I can get to find credit to shape up my eco-industrial clusters. In the traditional ways, we would think that we would take the budget from the government and the contribution from local community and enterprises. But then I think that in my cluster analysis, I have not analyzed that one of very important factors or components is buyer, and I think in the new approach maybe the buyer can help to set up this eco-industrial cluster inside the country. We have one model called eco-fish feeding support by Germany. The Germany buyers will set a standard and requires Vietnamese fish farmer to raise the fish with bio-foods and with a very clean way in order to produce very good quality of fish for their market. It is only for their market, and they will consume our entire products. But unfortunately this cannot work in the large scale, because I think the budget is limited and also the demand from the market, from Germany is limited. Another way to approach this sort of problem is the international market. International buyers can have influence and also can help the country to set up the first buyer model in our study areas. Thank you.

Gunjima

Thank you very much. As we approach the time when we have to end this session, we continue our discussion as each person shares additional information on various factors that could be important in developing an EIC. I intend to lead the discussion and to provide you with additional pieces of basic information to assist your judgment, about which I expect the audience to give us feedback, using the questionnaire forms that have been distributed.

Finally, we would like to answer a question from the audience concerning technology transfer. The questioner asks: "I would like to hear more details about technology transfer, mainly from an advanced country to a developing country. What are the reali-

ties of and challenges to technology transfer? Who or which sector should assume the leadership? Excuse me if this sounds like a vague question."

In connection with this question, I would like to read the fifth question from the questionnaire form: "In your opinion, what kind of contribution should Japan make to the development of EICs in Asia?" Bearing in mind that we discussed financing a little while ago, I would say that Japan's possible contributions to the development of EICs in other parts of the Asia include financial support, technology transfer, activities by Japanese corporations in the given locality in a manner supportive of the creation of employment and the sharing of information based on experiences in Japan. In addition, probably as a form of support backed by government policies, Japan may contribute by dispatching and developing human resources. JICA's activities, for example, fall into this category. I invite Mr. Shibusawa, who used to work at JICA, to speak briefly on this subject. After that, I would like to invite the guest panelists from developing countries to share their views.

Shibusawa

I worked at JICA a long time ago. I believe that the present approach by JICA differs greatly from the approach I knew in the past. When I was working at JICA, my biggest concern was the prevalence of mismatches among the technology required in the field, the technology that the government of the recipient country believed that they needed and the technology that Japan intended to provide.

The most characteristic feature of EICs is that there can be no perfect model from the outset. Rather, the local community has to start from imperfection and through various discussions within the community and with support from people outside the community, gradually strive toward perfection. This process, therefore, always requires a very flexible form of technology transfer, or in other words, different forms of technology transfer for different phases of develop-

ment. In discussions with any national government, we often hear requests for the transfer of state-of-the-art technology from Japan. Such technology transferred from Japan, however, will never suit a given community. In order for an outsider to know in detail what is required by the local community, I believe that it is always necessary that people go there to gather information and spend a considerable time living in the community, acting as a bridge to other countries.

They bridge, not only between technologies but also between markets, as mentioned earlier by Ms. Van Ha. For example, fair trade practice is now gradually becoming common in Japan. I was once in the frontline of mangrove planting and shrimp pond development projects. One of these projects involved the development of an eco-shrimp market in Japan. I was involved in the project to enable the cultivation of eco-shrimps by planting mangroves in shrimp ponds that had been polluted by chemicals to the extent that this was widely recognized as a problem, bringing about the birth of a new eco-industry. I believe that a challenge for advanced countries is how they may provide not only technology, but also an appropriate market for the given country to penetrate.



Gunjima

Now, from the viewpoint of developing countries, what contributions are expected from Japan? Mr. Shibusawa mentioned that if Japan is to take the initiative, we should avoid a mismatch with reality by

starting with decent research of needs or seeds in the given locality.

I invite any panelist from a developing country to share their views about a desirable form of cooperative relationship with Japan, important factors pertaining to such a relationship and the types of organizations in Japan that should be involved.

Visvanathan

Thank you very much Mr. Chairman. I think as Dr. Shibusawa put it very correctly, it is important that technology suppliers have to work very closely with community, because we started with a clear understanding of the EIC for developing countries in Asia. The main driver of these projects is the community participation. Whatever technology we are going to bring into this, it has to be owned by community and operated by community. We should, to a large extent, avoid importing technology directly. It is very important to develop or adapt a technology and train people in the competence at various levels, so that the community feels they are not using some alien knowledge. They should feel that it is something - it is day-to-day in their life. Regarding the financing part of EIC, when it comes to operation and maintenance, it has to be handled by the community, whereas the initial investment of capital can come from donor agencies, the government, or different possibilities. In the end of the day I strongly feel that it has to be operated by the community to a large extent.

I think intellectual property is an issue, when we are talking about transferring technology and developing technologies. There is one interesting case among our studies, which is the bio-fuel generation from fish fat in Vietnam, and there is an issue related to intellectual property. Is it easy to transfer the technology, for example, from Japan for anything direct to a developing country? How do you over cross this issue? That is one issue we never looked at. But I think it is important that boundary should be crossed so that the technology could transfer and be taken up by

community. I think this is one of the bottlenecks, but maybe it is not in all cases, in some cases, it might be important. Thank you Mr. Chairman.

Gunjima

Mr. Nagendran, please go ahead.

Nagendran

I see it as a kind of four-point program. One is that Japan could be the most sought after country for technology transfer with reference to sericulture in our case study. The Japanese model would go well with Indian model because of this Asian connection instead of drawing in some western model which may or may not work. The number two is JICA and sericulture, which have been brothers for a long, long time, and technology transfer to this field would be extending the support that is already given. Instead of going into a new pasture, I think JICA can be a wonderful agency, and Japanese contribution should be monumental in furthering the interest of sericulture. Then as I made in my presentation, there are some issues to be tackled. These cannot be done by very basic research or some kind of basic applied research, so institutes like IGES and other universities in Japan and universities in India can have a joint research project to develop this. After the development of the technology for converting some of the byproducts into useful products, Japan-Indian small scale entrepreneurs can taken it up as joint venture. I think it would be a model that could be successful. Thank you.

Gunjima

Thank you very much.

Ms. Van Ha, would you like to add something?

Van Ha

I think that Japan can absolutely be the leader of the technology transfer to our case. I am sure of it after listening to the presentation from Mr. Nakashima, who also works with bio-fuel. I also heard what the

JICA Japan has achieved, and we already have successful model on the shrimp. We are thinking about this joint research. Also from the ODA, I met one of the researchers in Kyoto University, and we had the same interest and need further cooperation. Thank you.

Gunjima

Thank you very much.

Mr. Nakashima, do you think the Maniwa model from Japan is transferable to other countries in Asia as it is? What do you think is a possible form of cooperation or assistance that you may be able to provide? I invite you to speak briefly about this.

Nakashima

That will not be easy. However, I would like to mention that, in the area of advanced technologies for wood biomass utilization, gasification technology is currently in focus. By the end of this year, we plan to experiment with Finnish technology. It is a very small gasification furnace but produces a lot of gas. Since it does not require a major facility, I expect to find it useful in practice.

Gunjima

Thank you very much. As you know, one of the missions of IGES is to identify the ways in which we can support environmental efforts in Asia. I might say that it was rare in the past for the IGES Kansai Research Centre to have organized a symposium or workshop with so many guest panelists from other parts of Asia. Since we don't want this to be the last such opportunity, I now invite each panelist to share his or her expectations of the progress we can make by continuing these workshops. Let us discuss what we can achieve together by combining our efforts.

At the end of this session, I would like to invite Mr. Anbumozhi to summarize the remarks from the other panelists and make a suggestion on the orientation of our efforts in the future. Now I invite each panelist to

share his or her expectations of the ways in which we can cooperate with each other as we continue this project.

Nagendran

In one way, we continue our progress is nothing like demonstrating. Probably in the next step of the project, we should establish a functional EIC, however small it is in size, and demonstrate it to the public at large and then to concerned ministries in the country and also to the donor of the project. And then it is possible to achieve the objective of the project, if EIC is established. I think we should move in the direction of first whatever existing physically that need to be more crystallized, and pumped in more functionality. That's how EIC's role can be demonstrated to show how it can be a working model instead of remaining a table model.

Visvanathan

I would say there are two things we can do. Initially, our research finding should be circulated to a large extent to the Japanese potential investors. There are three different sectors, and there is possibility of bringing them for a field visit or dialogue with the stakeholders of our studies. There is a possibility where we could have a meeting, I mean, directly on the field. So, ours is basically a research to look at different possibilities, potentials, and so forth, and to bring the stakeholders. Through this information transmitter, we have a field dialogue, then we can see how it could be; some technology could be transferred and looked into the next stage of investment. I think that has to be mobilized by IGES, and surely we as partners, will be able to help you to decide this, no problem, but I think we need to mobilize on that. Lastly, I am sure there is potential to extend this study to other countries. There are other bigger countries that have potential, so we may also look into them as a possibility. Thank you.

Gunjima

Today's audience includes representatives from corporations and NPOs. So far we have answered only some questions from the audience. Now, I would like to invite comments from the audience.

Floor

Ms. Van Ha from Vietnam has made a good point. According to her, Vietnam neither has legal standards concerning the formation of clusters nor standards concerning solutions. I am very concerned about that as a policy issue. While I am satisfied with many of the comments by the panelists about the philosophies of EICs, I get the impression that policy issues, along with technology, are very important. Technology is important because planning finally depends on technology. Is the government going to regulate the development with laws or systematize the development? And will the project take place in Ho Chi Minh in the south of Vietnam?

Van Ha

I think further standard should be issued from the government, and as I presented in our study so far we lack some policies related to the bio-fuel. It is a new product to us and has involved a lot of development of techniques. Now we produce the bio-fuel from the factory - from this pilot experiment only can be used for the fish farmers. They cannot sell in the market because we do not have the product quality standards. So now the university, institute, researchers want to



find a solution how to propose to the government in order to issue the standard immediately. I think we do not have much experience, so we could borrow the standard from developed country like Japan. That is one aspect that Japan also can help, I think, to drive toward the right direction of the policies made by the government.

Floor

Thank you very much for your consideration.

Van Ha

Thank you for your comments.

Gunjima

Mr. Anbumozhi, would you like to say something before we close?

Anbumozhi

Thank you very much, and I agree with most of your observations. As you know, the IGES is a research institute. Our mandate is to do research rather than to go in for direct implementation. Moreover, we don't have the capacity to do it. On the other hand, we can facilitate implementation first by communicating the findings as messages to the policy makers for actions. That is the immediate first thing we can think of. There are potentials for extending further analyze and dissipating this information to the developing Asia. We identify these success stories, analyze them and develop a common framework for EIC, which can be dissipated to the policy makers in the developing Asia.

Also there is observation on technology transfer. I think in a broader sense, it is not only the technology, but it is knowledge transfer, which also includes technology. In that sense, I could visualize three important actors in the international cooperation regime related to EIC. Of course, when coming to the technology, it is owned by business; so it is basically cooperation between the enterprises. These technologies

may be spread across various fields like energy, water etc. This is the hardware aspect of knowledge transfer component that we are discussing. Then there exist software components such as planning aspects as well as the capacity and capability of these companies located in the clusters to improve their environmental performance and innovativeness. This needs government to government cooperation. Then another is the human ware or social capital, which may need a kind of NPO and NPO cooperation at international level. So we need a have business to business cooperation, government to government cooperation and the NPO to NPO cooperation between Japan and other Asian countries. Of course, whether we like it or not, we are living in geographic entities named countries that are governed by sovereign rules and policies. These policies have to be reoriented towards facilitating this kind of knowledge transfers.

As a research institute, we are capable of acting as a facilitator and international communicator to disseminate these results to the policy planners, business community and NPOs and help them in designing action plans. Thank you very much.

Gunjima

Thank you very much.

[Concluding remarks]

Gunjima

Today, we shared some views concerning the realities of and challenges to the development of EICs in Asia. In the future, as we continue to make progress in studying this theme, our aim is to share our concerns with all of you about what we can do and how we may move toward the formation of a sustainable society through cooperative relationships with other countries in the Asia.

We conclude the session now. Let's applaud the panelists. Thank you very much.



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