

20% Club for Sustainable Cities

*Case Studies from the Workshop for Post Johannesburg
~ Taking Action from Ground-level*



Looking for Sustainability in Cities

March 2003

20% Club for Sustainable Cities

Preface

Last August, on the 10th anniversary of the Earth Summit in Rio de Janeiro, the Johannesburg Summit was held to discuss how much progress we had made towards the targets set in Rio. In Johannesburg, it was emphasized that the variety of 'programs' inaugurated after Rio, ranging from the global agreements such as the Framework Convention for Climate Change to the local plans like the Local Agenda 21, now need to be successfully implemented: the motto here is "from Agenda to Action".

Since one-fifth of the total world population inhabit China, Japan and Korea, reducing the environmental load in this area will make an enormous contribution not only to environmental protection in northeast Asia, but also to the whole earth's future. It is vital, therefore, that these three countries, which are close to each other both geographically and in their interconnected histories, should establish a solid partnership in the environmental field.

Having recognized such a challenge, the 20% Club for Sustainable Cities held the '20% Club Joint Workshop for China, Japan and Korea – Stepping Forward to Action, Post-Johannesburg Meeting' (March 2003, Korea). Its purpose was to share information and experience for building sustainable communities, and to strengthen the network among those local governments and NGO/NPOs from all the three countries which have been "stepping forward" in the fields of water conservation, agriculture and energy.

Yangpyeong, the county where the workshop was held, is located 50km east of Seoul with a population of 83,000. With 75% of its total area covered with forestland, people in Yangpyeong have enjoyed bountiful nature. The county implements several important environmental programs. The 'Love for Pure Water' project received 30% of the total county budget in order to protect Paldangho which provides water to 22 million metropolitan residents. Organic agriculture is another initiative that Yangpyeong has taken: an 'Environment-Friendly Agriculture' project has been promoted with a focus on the '3 Don'ts' movement which aims to eliminate chemical weed killers, agricultural chemicals and chemical fertilizers.

More than 150 people, including environmental experts, residents and NGO/NPO representatives, participated in this workshop. There were many useful presentations of case studies; these included, from Japan, a project for natural energy use in Kuzumaki Town, a paddy field promotion program by *Medaka no Gakko* (NPO) and a forest management program in Kanagawa Prefecture; from China, water quality conservation programs in Liaoning Province and Shengyang; and from Korea, organic farming and river regeneration activities.

At the end of the meeting, an encouraging comment came from a participant: "I feel we have taken a few steps towards the final target of building a sustainable society, after exchanging information and experience which had been gained from actual project implementation.

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20% Club for Sustainable Cities

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1. Outline

Theme	Post Johannesburg Taking Action from Ground-level
Date	9:30-17:00, March 21, 2003
Location	Yangpyung County, Republic of Korea
Organized by	20% Club for Sustainable Cities, KLA FIR (Korea Local Authorities Foundation for International Relations), and Yangpyung County
Supported by	Kanagawa Prefecture (Japan), Ministry of the Environment of Japan, Environment Division of Republic of Korea, Kyonggi Province (Republic of Korea)
Language service	Japanese, Korean, Chinese

Aim of the workshop

Most of the global environmental problems that we face today result from regional economic activities and people's everyday life. In order to solve these problems, it is crucial for municipalities that constitute the regional community, citizens, NGOs/NPOs, and corporations to actively take part.

It also is indispensable for China, Japan, and Korea—which are geographically and economically deeply linked—to cooperate at the municipality level, to promote the creation of a sustainable community in the East Asian region where one fifth of the world's population resides.

The 20% Club for Sustainable Cities has been promoting exchange and networking among municipalities that have set numerical goals to reduce environmental impacts. In order to enhance these activities, this workshop will focus on Water, Agriculture and Food, Nature Conservation, and Community-Based Energy. With municipalities and NGOs/NPOs from Japan, China, and Korea all coming together to share their knowledge about the best practices in the various fields, we will seek pathways for East Asia's Sustainable Development.

BOX . About Yangpyung County

Yangpyung, home to 83,000 people, is 54 km to the east of Seoul Metropolitan City. Having Lake Paldang, a reservoir for 22 million metropolitan residents, it has strict water regulations, which dissuaded industrial development. The County became one of the pioneers of environmental agriculture, with the "3 Don't's" movement (Don't use: pesticides; agricultural chemicals; chemical fertilizers) and "3 Dos" Movement (Do create: habitat for locusts; habitat for fireflies; field of scarecrows). Nearly 50% of the budget is spent for water conservation and environmental agriculture.

A scheme enabling NGOs to take part in administration allows 100 representatives from 69 NGOs to work in the Council Office.

5 targets were set to be achieved by 2005; 10% increase in organic agriculture practice, 7% reduction in total waste volume, etc.

Workshop program

Acceptance		9:20-9:30
Opening & Welcome	Lim Shu Bok (President of KLA FIR)	9:30-9:40
Remarks		
Keynote speech	Han Tak Soo (Mayor of Yangpyung County) "Environment policy of Yangpyung County "	9:40-10:00
The first session	[Theme] Sustainable Agriculture, Food, and Energy	10:00-12:00
	Chairperson : Il Chyun Kwak (Ph. D , Department of Regional Development Studies of Kyung-Won University, Environmental affairs officer of Economic and Social Commission for Asia and the Pacific)	
	Case Study Presentation (20 minutes for each)	10:00-11:00
	Mr. Tetsuo Nakamura (Mayor of Kuzumaki Town, Iwate Prefecture, Japan) "Challenge of Kuzumaki Town producing milk, wine, and clean energy"	
	Ms. Si Jianghua (Heping Section Sanitation Monitor Station Shenyang, China) " The Measures of Controlling Water Pollution and Solving Shortage of Water Resource in Shenyang "	
	Mr. Jung Sang Muk (President of Paldang Organic Farming Movement, Republic of Korea) "Best Cases and Problems of Environmental Friendly Agriculture near the Source of Water Supply"	
	Question and Answer, Discussion	11:00-12:00
< rest >		12:00-14:00
The second session	[Theme] Maintenance of water and natural environment	14:00-17:00
	Case Study Presentation (15 minutes for each)	14:00-15:15
	Mr. Song Jiming (Liaoning Province Environmental Protection Bureau, China) "The tenth five-year(2000-2005) plan for water pollution prevention in Liao River "	

Mr. Goto Tsunekatsu (Director of Technical Coordination Water Catchesment Forest Development Division, Environment and Agriculture Department, Kanagawa Prefectural Government, Japan)
" Forest Management Project for Water Source Areas"

Mr. Kim Eui Wuk (Director-general of Policy Planning of YMCA, Republic of Korea)
" Environment Recovery of River and Farming Community)"

Mr. Nemoto Shinichi (Vice-Chairman, *Medaka no Gakko*, Japan)
" *Medaka no Gakko* Promoting 'Life-Rich' Paddy Fields"

Mr. Yoon Yeo Chang (Director of Green Group21, Republic of Korea)
"Restoration Movement of Anyang Stream"

< rest >

Question and Answer, Discussion

15:15-15:35

15:35-17:00



Welcome & Opening Remarks
(Mr.Lim Shu Bok, President of
KLA FIR)



About 150 participants
attended the sessions.

Workshop

【Keynote speech】

Environment policy of Yangpyung County

Mr. Han Tak Soo , Mayor of Yangpyung County, Korea

Yangpyeong County, surrounded by beautiful mountains, and with a river of pure water running through it, has taken energetic step to regenerate its natural environment. Among the widespread evidence of environmental destruction that has become apparent in recent years, there are problems concerning water on a global scale: examples include acid rain and shortages not only of drinking water but also of



water for agricultural use. It is estimated that 50,000 species out of a total of 1.75 million are disappearing every year, and that 33% of all the earth's creatures are destined for extinction. The size of these problems can be seen from the fact that the senior politicians from 119 countries from all over the world met at an international summit to discuss global environmental protection and sustainable development, cooperation and internationally coordinated policies concerning environmental issues.

To turn from the macroscopic to the microscopic, I would like to introduce Yangpyeong's environmental policies. Yangpyeong County is located in the east of Kyonggi-do (Kyonggi Province), and has large areas of beautiful landscape. Because the Paldangho Dam, which provides precious water to the metropolis, is in Yangpyeong, for the last 30 years, the area has been designated by the central government as an 'Upstream Water Source Protection Zone' and a 'Specially-Designated Area for Environmental Measures'. This has made Yangpyeong the most environmentally-aware county in Kyonggi-do. Kyonggi's farming population has decreased to 80,000, and as an area that remains primarily agricultural, Yangpyeong is not wealthy. But despite the fact that government restrictions which has been imposed on the area in order to protect the Paldangho Dam have prevented Yangpyeong from achieving a high standard of living, the county has been doing all it can to promote environmental measures. The precarious state of Yangpyeong's financial condition is apparent from its GRDP (gross regional domestic product) ranking the 30th in the country. However in order to protect the upstream water source, six wastewater treatment plants in the county have taken steps to improve the water quality, and this has led to a significant reduction in the level of pollution. The 'Yangpyeong Twenty-Year Plan for Comprehensive Wastewater Treatment Policies' has also been established. The Plan aims at effective management of wastewater treatment in

both the agricultural and domestic spheres, based on the understanding that wastewater from both sources has detrimental impact on the global environment. We also encourage reduced washing machine use because of the quantity of dirty water they discharge. However any environmental protection movement confined exclusively to Yangpyeong is necessarily restricted in scope. Therefore Yangpyeong has enlisted the support of the central government, in order to protect water resources and to create a more sensible approach to water use, and in this way involve all those who benefit from the water of the Paldangho Dam including those who live in downstream areas.

We are also promoting a new agricultural project which focuses on organic farming and environmental protection. In addition, we are making our village and countryside genuinely 'environment-friendly' by implementing long-term projects like 'Creating a Habitat for Locusts and Fireflies' and 'Creating Fields for Scarecrows'. We are especially proud that in 2001, we became the first organization in the world to receive the ISO 14001 certification in the field of management systems for environmental agriculture. Government regulations for protecting the natural environment are established in order to stop unplanned development and to ensure that development is harmonized with the environment. Before new development projects are implemented, their impacts on the environment should be considered. Because of our efforts to ensure that this has done, we have established for ourselves a distinctive image: 'Yangpyeong, the Environmental County'. We will continue to make an effort to maintain a balance between environmental protection and living standard.

I do not think that it appropriate to rely on government institution for environmental protection, because such initiatives will always be subject of a certain limit. Local water conservation requires a commitment from those residents who have a direct interest in the issue, and this in turn requires that each individual must be given an incentive. Let me cite one successful example of residents' involvement. A certain river with a low-grade environmental ranking – grade 5 - in Chungchongnam-do was regenerated so successfully that it was reclassified as the first grade river, as a result of local residents' effort to revive it. The driving force behind this was a potential threat to their property rights: there are restrictions on exercising such rights if the property is in an area subject to regulations. Our county can follow this example, and we will try to improve our living standards while at the same time protecting our water quality. We would also welcome assistance from outside. Those local residents who were rather indifferent to environmental protection now see themselves as stakeholders, and have a strong awareness of the importance of involvement in conservation activities and policy-making.

We are honored to hold this workshop on March 22, which is World Water Day. We hope that the Workshop will produce diverse opinions and useful discussions, and that the participants will find the occasion fruitful for helping their quest for sustainable environmental protection. Lastly, I would like to express my gratitude to the President of KLAFIR, the 20% Club

secretariat, and the participants from Korea, China and Japan. We wish you all a pleasant stay here, and hope that you will return home with a good image of Yangpyeong. Thank you.

(Note: This is a translation from a Japanese version of a Korean original.)

【Session 1】 Theme : Sustainable Agriculture, Food, and Energy

Challenge of Kuzumaki Town producing milk, wine, and clean energy

Mr. Tetsuo Nakamura, Mayor of Kuzumaki Town, Iwate Prefecture, Japan



Since 1975, Kuzumaki Town (with 9000 residents, 3000 households) has implemented a large-scale dairy farming development as part of a national government project. By building a 75km road through a mountain range with several thousand-meter peaks, it has created pastureland covering 1,100ha, divided between 7 private farms and several public ranches. The public ranches have been managed by a joint public- and private-sector organization, the 'Kuzumaki Public Corporation for Dairy Farming Development' (KPC), since 1976. When this organization was founded, I was a staff member of the town office, and was sent there as a manager. For 23 years, until 1999, I worked for its development at various administrative levels. To start with, there were 10 staff members and a maximum of 365 cows (in summer), and the turnover was 20 million yen. Now there are 100 staff members, 3000 cows in summer and 2500 cows in winter. Besides cattle breeding, the business includes hotels, restaurants and treated/processed milk production, and recently turnover reached 1.1 billion yen (60 million yen net profit). It achieved the highest profit among all the 1,150 public ranches in Japan. Three ranches managed by the KPC have now also become producers of clean energy, as I will explain.

I have always considered that my guiding principle in administrating Kuzumaki Town should be to make maximum use of the diverse resources, capabilities and individual talents which the town possesses, in order to further the town's progress while at the same time making a contribution to solving the problems of the 21st century global issues, such as food, environment and energy. By promoting dairying, cattle breeding and agriculture, the town contributes to food production (the daily production of our milk, 111 tons, is equivalent to the

necessary daily calorie intake for 37,000 people). The total area of the town is 43,000ha, of which about 90% consists of forests. Facilitating forestry and forest preservation helps increase carbon sinks, and thus makes contribution to the global environmental situation. The town also has developed the clean energy, which will be described in the following section in detail, here too is shouldering its share of the responsibility for the world energy problem. While addressing all these agendas, the town also makes its own progress.

In March 1999, with support from the New Energy Foundation (NEF) and the New Energy and Industrial Technology Development Organization (NEDO), the municipality inaugurated in its 'New Energy Vision' program. Prior to this, the municipality invested 2.5 million yen, a quarter of the total capital, in Eco-World Kuzumaki Wind Power, Ltd., and took a share in its management. In June 1999, three 400kw-windmills were installed in Sodeyama-kogen Ranch (managed by the KPC) at the cost of 340 million yen. They can produce enough electricity enough for 900 households, which is sold to the Tohoku Electric Power. Current annual turnover is 28 million yen, and the town also gets property tax income (20 million yen annually, averaged over 15 years).

A survey to check wind conditions was conducted over two years in Kamisodegawa-kogen Ranch (also managed by KPC) by the Electric Power Development Company (EPDC). The result showed that the site was one of the most promising places for wind power generation in Japan. In 2001, the Green Power Kuzumaki Wind-Power Generation, Ltd. was founded with 100% subscription from the EPDC, and a capital of 100 million yen. In 2002, work started on the installation of twelve 1,750kw wind-power generators (maximum height, 93m) at a total construction expense of 4.7 billion yen. Power generation will begin in December 1, 2003, and will provide electricity equivalent to that for 16,000 households. This also will be sold to the Tohoku Electric Power, and is expected to yield about 550 ~ 600 million yen. The municipality itself has not joined the management, but has supported the project by helping arrange planning permission and facilitating the procedures prior to the construction phase. For this, the EPDC donated 70 million yen to the town. The town will also benefit from the property tax income – approximately 30 million yen annually, averaged over 15 years.

In March 2000, a solar power generator was installed in Kuzumaki Junior High School. This only generates 50kw of electricity, but provides 25% of the school's demand, and also encourages the students to get interested in clean energy.

In 2000, with support and advice from NEDO and NEF, a feasibility study for the introduction of bio-mass energy into Kuzumaki was conducted. In 2002, a generation facility was built in Kuzumaki-kogen ranch, where excrement from 200 Holstein cows from the ranch is mixed with kitchen garbage from the residents to produce a calorie level sufficient for methane gas to be produced; electricity is then generated by combustion of this gas. This

is expected to become operational in May 2003. The machinery used is German (cost, 250 million yen). The power to be generated is 35kw, and all of it will be consumed inside the ranch. The slurry that is left after extracting the gas will be used as a fertilizer. Moreover, in 2001, a research project, 'Kuzumaki Cogeneration System by Advanced Bio-Gas Application' was initiated as a partnership between industry, academia and administration, with support from the Bio-Oriented Technology Research Advancement Institution. The purposes of this project include development of a high-efficient bio-gas generation system (stable supply of bio-gas), a high-level bio-gas refinement and concentration system (concentration and compressed cylinderization of bio-gas), and a fuel cell for bio-gas. If we succeed in putting the gas in cylinders for sale, we could use the excrement of 650 tons discharged daily from our 13,000 cows as a resource, rather than (as at the moment) a waste product requiring disposal. This will be consistent with our principle mentioned earlier.

As a part of our local resources, we have forests. The process of making wooden chips creates, as a byproduct, a vast amount of barks and pieces of wood. There is a factory in the town where these discarded pieces are crushed and heated to make wood-pellet fuel. In Kuzumaki, the local wine is made from wild-grapes. The winery uses a boiler with wood-pellet fuel (250,000kcal/h) for heating. In April 2003, a new Old People's Home will open. The place will have a floor-heating system and the boiler will use wood-pellets (2 boilers of 500,000 kcal/h). The power will be provided by a solar-power system (20kw).

Another source of clean energy in Kuzumaki is hydropower at the 'Seven Waterfalls' area. These waterfalls are illuminated at night by electricity generated by a micro- hydroelectric generator. The town supports a 'School of Forest and Wind' at the site of the former school, and runs a 'Natural Energy School'. In 2001, the School made its own windmill and solar-power generator, and in 2002, it conducted a survey on solar-heated water, bio-gas experiments, etc., as a study material for schoolchildren and students, and also for ordinary citizens. The municipality provides instructional visits and an environmental information magazine called 'Eco-Net' so that people can learn more about clean energy. As mentioned before, the municipality received a donation from EPDC for its contribution to the inauguration of Green Power Kuzumaki Wind-Power Generation. The municipality has used this to create a fund, which provides local residents with subsidies for switching to new energy, and promotes a new energy vision, and an energy conservation vision, with help from NEDO, in order to save energy in the town. Our target is to establish a self-sufficient system for clean energy use, and to play our part in solving the global energy problem.

All these activities have been publicized through lectures I have given, seminars I have participated in seminars as a panelist, or newspaper articles and TV programs I have featured in. As a result, such a small town like ours, all town corners of which you can cover every corner in a 90-minute drive, has suddenly become the focus of nationwide attention,

and we have had an endless streams of visitors. Kuzumaki is 3.5km away from the closest train station, and 60km away from the closest highway interchange. There is no hot spring, no ski resort, and no golf course. Formerly people did not visit such a place. But during the last 5 years, the number of visitors has grown from 200,000, to 250,000, then 300,000, then 370,000, and now 500,000 each year, and mainly they come to see the Kuzumaki-kogen Ranch, winery and clean energy projects as these have become well-known. The more people have come, the more exchange programs have been created. Subsequently at the various facilities, sales have been increased and employment can be expanded. Kuzumaki has become a 'lively town', a place worth visiting, indeed a must-see destination. The revitalization of the town is in progress.

The Measures of Controlling Water Pollution and Solving Shortage of Water Resource in Shenyang

Ms. Si Jianghua, Heping Section Sanitation Monitor Station Shenyang, China

Introduction

Shenyang, the capital city of Liaoning Province, is the economic , cultural, transportation, financial and commercial center of Northeast China and a city famous for its history and cultural heritage. At present, total area of the city is 13000 Km² including area of urban area 3500 Km²; Population is 6.71 million, including population of urban area is 4.73 million. Shenyang was developed by the state as a key heavy industry base, since 1950s. However, few measures were taken to control pollution or to protect the environment over the past decades, serious water pollution and shortage of water is one of the major environment and resource issues which Shenyang faces currently.



Status

Hun River is the main river of Shenyang and the river accepting wastewater of urban area of Shenyang, and is the surface water body which is of great influence to economic development and people's living of Shenyang. At the beginning of 1960's, because flow of Hun River is small in dry season after the construction of Dahuofang Reservoir. Hun River was polluted by the wastewater of Shenyang. Now volume of wastewater charged into Hun River is 1.46million M³/day. The quality of water in Hun River was serious polluted.

Average utilizable water resource volume per person of Shenyang is 354 M³. Comparing with the international critical value of water crisis (average utilizable water resource volume per person is 500 M³), Shenyang is under the condition of water crisis.

Pollution of water quality and shortage of water caused by human activities. In particular, following development of cities, development of industrial and agricultural production, and increase of population, this issue is more and more serious, which not only influences urban and economic development, but also may thread the existence of human being in Shenyang.

Shenyang city has input certain staff, funds and materials to save water consumption by disposing industrial wastewater, strengthening environmental protection, developing program for controlling water pollution, and compiling regulations of environmental protection, so as to control the development trend of water pollution of Shenyang.

In order to effectively control the trend of pollution of water environment, solving shortage of water resource of Shenyang and realize planned objective, the measures of combining management with pollution treatment must be implemented. The objectives include that to strengthen control and management of industrial pollution for reduce drainage load; to build urban wastewater treatment plant; to reutilize all wastewater after treatment; to change urban industrial composition; to improve self-cleaning of river.

Measures of solving shortage of water resource

Saving water

Saving water is a main measure of solving the shortage of urban water resource and an effective means of reducing drainage of wastewater and improving environmental quality. Main reasons which cause the shortage of water resource of Shenyang are large consumption, low utilization rate of in industrial water, high loss of agricultural water consumption and serious waste of civil water consumption. Thus, saving water and increasing water utilization rate are main means of solving the shortage of water resource of Shenyang.

To develop new water source

Developing new water source is the fundamental means of solving the shortage of water resource of Shenyang. "Allocating water from the east to the west" Engineering will be implemented in 2000-2010 by guiding water Huanren Reservoir to Dahuofang Reservoir and then to Shenyang through Hun River, its expected annual water supply volume is 365 million m³/a; "Allocating water from the north to the south" Engineering will be finished during 2010-2020 by guiding water of Heilongjiang River and Songhuajiang River to Liao River and then supplying water to Shenyang.

Measures of controlling water pollution

Municipal wastewater treatment plants construction

By 2005, 4 municipal wastewater treatment plants will be built in Shenyang with the total capacity of 12000000m³/d and the municipal wastewater treatment ratio will reach 80%. The treated wastewater will be used for industry, urban greening and agricultural irrigation. Treating water can not only control pollution of water quality, but also relax the shortage of water resource.

To strengthen prevention and treatment of industrial pollution

- To implement pollution treatment in source, drainage within standard, and controlling total volume of drainage in main industrial source of Shenyang.
- To adjust urban layout, to remove polluting enterprises located in city proper.
- To adjust industrial composition of the city, to control development of those sectors with high material and energy consumption, low utilization rate of resource, and serious pollution.
- To pursue clean production process, to make process level of industrial production reach advanced domestic level.

To regulate water flow

- To regulate outflow volume of Dahuofang Reservoir scientifically and rationally.
- To increase outflow in dry seasons, to guarantee water demand volume of environment in the section of Hun River in Shenyang.
- To sufficiently utilize the self-clean function of water body to reduce pollution to control pollution of rivers in dry seasons.

Best Cases and Problems of Environmental Friendly Agriculture near the Source of Water Supply

Mr. Jung Sang Muk, President of Paldang Organic Farming Movement, Republic of Korea

Introduction

Paldangho, one of the most important water sources in Korea, is an artificial lake created by the dam construction at the meeting point of several rivers including Namhangang (South Han River) and Bukhangang (North Han River). Water continues to flow downstream through this



lake, as in a river. Paldang Dam was constructed in December 1973 for hydropower generation. Its reservoir provides 244 million m³ water for domestic and industrial use to 20 million metropolitan residents.

On July 9, 1975, in order to secure a supply of clean water, the areas surrounding Paldangho in Kyonggi-do were designated as 'Upstream Water Source Protection Zone'. On July 19, 1990, the upper areas of the lake became 'Specially-Designated Areas for Water Quality Protection'. These areas had been already designated as a 'Green Belt' (meaning an area where development is restricted) since October 7, 1971. Therefore the local residents have experienced considerable hardship by numerous restrictions imposed on them, apart from the obvious loss of agricultural land and houses as a result of the dam construction.

'Affected Residents Joint Committee in Paldang'

Under the military regime, the local residents were treated like criminals through strict regulations and supervision. They were not allowed to expand their homes even in case where a room was too small for a chest-of-drawers to fit inside. Aerial photographs were often used for exposing residents' activities. People lived in terror. When democratic government came to power, the residents started to reveal their past suffering and the unhappiness which had been held back for years. Having started in the community of Namyangju-si which once took an important part during '3-1 Independence Movement' and which refused to surrender to the anti-reformist campaign, the drive for reform reached the Upstream Water Sources Protection Zone, too. It was recognized that an institution for the general public was necessary in order to face the imprint of years of pains and damages, and strict regulations. In February 1994, the 'Affected Residents Joint Committee for Action' was founded. On April 15, 700 people met at Yangpyeong Civic Hall for a public hearing on measures for the protection of Paldang upstream water source and for the livelihood of

residents who had been affected. This eventually led to the suspension of the Land Purchase System which was about to be established, and also to the revival of fishery (restricted to those local residents with permission).

Organic Agriculture Movement in Paldang

Although the Affected Residents Joint Committee for Action vigorously promoted their movement, it came to a turning-point because of the divergent views concerning the future courses among the leaders from different backgrounds. Pro-environment leaders insisted that they should protect the Paldangho even if this meant fewer benefit, while pro-development ones suggested that the regulations should be relaxed in favor of further development. Fierce disagreement between two groups resulted in resignation of the pro-environmental wing from the Joint Committee.

The pro-environment group, after numerous discussions on their principles, reached a consensus that the only way to protect and maintain clean water was to change their agricultural methods. Under the leadership of the farmers who had practiced organic agriculture for more than twenty years and those belonging to Christian Farmers' Society, on a snowy day, December 22, 1995, 'Paldangho Headquarters for Organic Agriculture Movement' was established.

Promoting Organic Agriculture in Paldangho

One resident of the Upstream Water Source Protection Zone suggested to the Central Agricultural Association that people living in Seoul, the biggest users of the Paldang water, should support the development of organic agriculture around Paldangho, since this is vital to preserve clean water. It was accepted. Later the mayor of Seoul and the chairman of the Association made an agreement to start a new program. The original plan included a grant of 40 million won each available to 2,500 farmers (total of 100 billion won at an interest rate of 5%) which should be paid back within 2 or 3 years on installments. Seoul City authority was going to settle the balance by paying 7.5% interest.

It was arranged that the organic produce would be bought by Seoul City authority, and that the City should provide shops (at least one in each district) while the Farmers' Cooperative would be responsible to manage these shops.

Initial Progress and Problems

Around this time, an 'Environment-Friendly Agriculture Section' was set up in the Kyonggi Branch of the Farmers' Cooperative. The office responsible for the Paldang area held a two-day workshop on organic farming at the beginning of the program. But it proved difficult to get the produce sold. Although a shop was provided by Seoul City Authority in

Garak-dong and was ready for business, the company in charge refused to sign the sales contract. In the end, the farmers could not sell their produce and simply had to take it back. Then angry farmers went to Seoul with their unsold produce, and held a demonstration in front of the City Hall. Because both parties were inexperienced in the organic farming business, maybe such a trouble was inevitable.

This deadlock was broken by seeking advice from experts on organic produce marketing from the Economic Implementation Union(Citizen's Union for Implementing Economic Fairness) and the Authentic Agriculture Co-operative. They came up to an idea that the Authentic Agriculture Co-operative will run the Garak-dong Distribution Center. The mayor of Seoul agreed with this, and the Paldangho Headquarters for Organic Agriculture and the Authentic Agriculture Co-operative jointly established the company called 'Senon'. But this new business was subjected to various forms of interference and harassment from other merchants in the area. Within a year, Senon was on the verge of the bankruptcy, at which point, the Authentic Agriculture Co-operative amalgamated it into the main body. Even that could not save Senon. The business did not prosper and the deficit steadily increased. In the end, as the biggest shareholder, the Paldangho Headquarters took responsibility, and Senon, again, was separated from the Authentic Agriculture Co-operative. The previous manager was called back to Senon for a new start, and a system of employee share-ownership was introduced.

Problems

(1) Training for environment- friendly agriculture

Training courses for environment-friendly agricultural practices conducted by an organization commissioned by the Farmers' Cooperative. Considering the significance of these, it would be better if the courses were given directly by the Environmental Agricultural Union, to which 27 organizations of organic farmers and consumers belong.

(2) Sales strategy

Although the original plan was to promote 2,500 organic farmers, only 1,137 (just above 45%) participated in organic farming training, and 70% of them were breeders. The current sales situation is not as good as was originally expected. The key to successful sales will be the introduction of a strategic approach.

(3) Independent organizations for farmers

Currently about 40 full-time staff members work for the secretariat of the Headquarters for Organic Agriculture, the Senon, a processing company and a distribution center. Considering that it was been only a few years in operation, the employment scale is remarkable. Mobility, loyalty and high negotiation skill - all cultivated during the Farmers' Movements - are the vital resources of the Headquarters.

(4) Involvement of the Farmers' Collectives

The Farmers' Cooperative played an important part in training organic farmers. But its general aversion to commercial innovation and diversification should be remedied.

(5) Farmers' attitude

Farmers are, on the whole, passive, partly because after the 'Saemaoul Movement', they have become accustomed to being guided by bureaucrats. The fact that farmers' dependence on the authorities leaves them unable to solve their problems is rather damaging for the future of Korean agriculture. Organic farmers should have strong willpower, courage and belief.

(6) Processing and sales of organic produce

The Paldang Headquarters for Organic Agriculture conducts all the processes of production, storage, processing, transportation and sales of organic produce. Among them the processing stage can generate significant profits. Moreover at this stage, lower-quality produce can be used to make other profitable products. But there are some problems concerning regulations on food processing.

Conclusion

In the past, the condition of Korean agriculture in terms of both exports and domestic markets, was very bad. However, even under the difficult circumstances that followed Uruguay Round negotiations and the humiliation of the IMF loan, organic farmers survived without too much suffering. The secretariat of the Headquarters receives 8.5% of the produce price from the members as a handling charge, and this funds institutional management.

The annual turnover is approximately 2 billion won; for a food processing company (bread, jam), 400 million won, for Senon and Senon Mart, 7 billion won.

Paldang organic farmers promotion program has not achieved the original target, but it is still at the stage of establishing itself. Meanwhile 32 farmers were given certificates for their organically grown produce by the National Institute for Quality Control of Agriculture Produce. Paldang represents probably the biggest single concentration of certified organic farmers.

There is also a suggestion that excrement from the area should be used as organic fertilizer so that not only livestock-breeders but also other farmers will benefit. On top of that, water will become cleaner, soil will be revitalized, farmers will be released from their dependence on chemicals, and consumers in the cities will buy safer food and will become healthier. One single initiative might thus create a quintuple benefit.

(Note: This is a translation from a Japanese version of a Korean original.)

The tenth five-year(2000-2005) plan for water pollution prevention in Liao River

Mr. Song Jiming, Liaoning Province Environmental Protection Bureau, China

1 Situation and Problems

Liao River is the biggest river in Liaoning Province with 480 km, it covers 69 k km². Liao River basin is one of the most important industry base of China and also the important crop planting area of Liaoning Province. During the period of “the Ninth Five-year Plan”(1996-2000), the average GDP increment is up to 10% per year. The socio-economic development had a great impact on pollution prevention field which arouse some new problems.



Scared water resources

The annual average water resource only 603 m³ per person which is 1/3 of the average national level. Up to 76.3% of total water resource has been utilized higher than national level. The shortage and over-utilization of water resource results in less runoff in river courses.

Serious water quality

In 2002 the domestic and industrial wastewater flow was 1.8 billion m³ which 1.15 billion m³ (62.8%) was from industry and 0.68 billion m³ (37.2%) was from domestic sector. COD load discharge was 479800 ton which 219700 ton (45.79%) was from industry and 260100 ton (54.21%) was from domestic sector. With the rapid development of high-yield agriculture and centralized livestock raising, over-applied chemical fertilizer and pesticide caused Non-point pollution has becoming more and more serious. In dry season of 2002, 9 out of 15 monitoring sections of Liao River worse than standard (COD 40mg/L), the compliance ratio was 40%, it was the worst one in China.

Targets

In order to promote pollution prevention in Liao River, “The Tenth Five-year Plan for Liao River” has been worked out to steer pollution prevention in Liao River.

Main tasks

Potable water sources protection for urban and rural residents;

Municipal wastewater treatment plants construction;
Pollutant loads reduction and gradually achieve standard compliance for all industries;
Commence pollution control in agriculture field;
Guarantee the quality of irrigation water and inshore marine water.

Water quality targets

Centralized potable water sources water quality is beyond standard (COD 15mg/L);
Remain or improve the water quality of river for better than standard.

Implementation

- Potable water source reservoirs protection

The water function zoning and catchment protection regulation of potable water source reservoirs will be formulated. The forest should be planted within the catchment to have the soil erosion under control.

- Municipal wastewater treatment plants construction

Accelerating the progress of municipal wastewater treatment plants and reusing treated effluent to both industry and agriculture have been regarded as the main approaches in solving water resource shortage and water pollution. Total 22 new municipal wastewater treatment plants will be constructed with the capacity of 1965000m³/d, the COD reduction will be 191200tons/a. There will be 33 municipal wastewater treatment plants when all proposed projects have been finished with the total capacity of 3965000m³/a and the municipal wastewater treatment ratio will reach 74.6%.

Wetlands protection

Shuangtaizi estuary wetland is a national level nature preserve zone. Shuangtaizi wetland makes the great sense in ecology protection to both Liao River and the areas further more. 1380 hectares degenerated wetland will be rehabilitated, additional 17009 hectares of reeds will be planted, 2001 hectares of cultivated lands will be replanted with reeds, and 4002 hectares bird forage zone will be established.

Industrial pollution prevention

Pollution prevention for industrial pollutant sources should be continuously strengthened to control both wastewater flow and load and reduce 20% of wastewater flow to achieve the goal in total load reduction and steady standard compliance discharge.

Water saving and wastewater resourcelization

31 water saving projects will be implemented and 424 million cubic meters water can be saved per year, up to 22.14% of municipal and industrial wastewater will be reduced.

Municipal solid waste disposal

The construction of municipal solid waste disposal plant should be speeded up to eliminate the impact to the river caused by the solid waste. It is proposed to build 6 new municipal solid waste plants with the total incremental capacity of 5700 tons/d. When all these works have been finished there will be 12 disposal plants with the capacity of 9740tons/d and municipal solid waste treatment ratio will increase to 88.22%.

Non-point pollution prevention

The main tasks in terms of Non-point pollution are standard compliance discharge for slaughterhouses, integrated utilization of livestock excreta and pesticide and chemical fertilizer applying reduction.

Forest Management Project for Water Source Areas

Mr. Goto Tsunekatsu

Director of Technical Coordination Water Catchesment Forest Development Division,
Environment and Agriculture Department, Kanagawa Prefectural Government, Japan

1. Introduction

As a member of the '20% Club for Sustainable Cities', Kanagawa prefectural government set itself nine numerical targets for environmental improvement. One of them is 'to expand designated forestland in water source areas under prefectural management from the current 9,200ha to 12,000ha in 5 years.' Since 1997 (fiscal year), the *'Forest Management Project for Water Source Areas'* has been implemented.



2. Kanagawa's Forests: Current Conditions and Problems

The forest area of Kanagawa is 95,000ha, accounting for 40% of the total area of the prefectural region (241,000ha). In 2000, the forest area in South Korea was 6.25 million ha (forest rate, 63.3%); in China, 163.48 million ha (17.5%); and in Japan as a whole, 2.4 million ha (64.0%).

11% of the forestland in Kanagawa (11,000ha) is designated as national property, and the rest (84,000ha) is owned by private individuals, corporations and municipalities. 38% of privately-owned forest is artificial forest plantations of cedars, cypresses, etc.

8.64 million people live in Kanagawa (as of January 2003). The per capita forest area is 110 m², which puts the prefecture in the bottom group among Japanese administrative regions. Nevertheless, the forest plays an important role in providing people with clean air and precious water.

There are 44,000 owners of forestland plots larger than 0.1ha in Kanagawa, 82% of whose plots are smaller than 1ha. The economic record shows that the profits from forestry have dropped dramatically, which has caused the decline of the business. Taking 100 as the base cost of planting and maintaining trees per 1ha in 1975, it was 281 in 2000, while net profit per 1m³ from a timber was only 30 yen.

3. Background of the Forest Management Project for Water Source Areas

In 1994, *'Kanagawa Forestry Program'* was established with a target of passing on local forests full of vigor and attraction to future generations in the 21st century (implementation period, 1994~2010). In this program, one of the central goals is to ensure a stable water flow.

In 1995, the year after the program's inauguration, lack of rainfall caused a nationwide severe water shortage from summer onwards. In Kanagawa, for the first time in 29 years, an Emergency Unit for Abnormal Shortage of Water was set up, and the requirement for a stable water supply for residents became more urgent.

This situation made us think that there was a limit to what the private forest owners could do for forest management, and that local residents who have benefited from water resource areas should also take part in forest preservation. In 1997, the *Forest Management Project for Water Source Areas* was inaugurated, in order to support privately-owned forestland in the water source areas, and to allow the public sector a role in its share of the management.

4. Outline of the *Forest Management Project for Water Source Areas*

Prior to the implementation of the project, target areas were identified in the forestland upstream of dams and water intake points. The preliminary survey was conducted to understand the present conditions of forest management, and moreover, to establish what measures should be taken for improvement (Table). Questionnaires were also sent to the forest owners to ask their opinions.

Table Management Conditions of Artificial Forest Plantations (1996; area of subject land, 4,000ha)

Management conditions	% of the total area
Active management	9%
No active management in recent years	40%
No active management for many years	47%
No prospect of forest growth	4%

The Project has classified the target forests in four categories, and identified a different management method for each of them.

(1) Four Types of Forests

Large-tree forests: forests composed of trees older than 100-years

Multiple-layered forests: forests composed of trees of different ages

Mixed forests: forests with coniferous and broadleaf trees

Broadleaf tree forests: forests composed of broadleaf trees

(2) Four management methods

Co-operation agreement and subsidies

Lease agreement for forest preservation in water source areas

Profit/responsibility – sharing forests in water source areas

Purchase

The forestland managed by Kanagawa prefectural government includes three types (, ,).

5. Planning and Achievement

(1) Management Plan

Over the period between 1997 and 2019, for 23 years, the plan envisages that 28,130ha out of 40,243ha of privately-owned forestland in water source areas will be restored and maintained (approx. 70%). 97.5 billion yen will be provided for this project from the special budget.

(2) Achievement

Over five years (1997-2001), a total area of 4,287ha has been secured as '*water source forestland*', which is 105% compared to the beginning of the project, and 15% towards the final target. The numerical target that Kanagawa declared in the 20% Club for Sustainable Cities was gaining 2,800ha of water source forestland, but in fact, 3,282ha has been secured, which is a 117% achievement rate for the target. During these five years, restoration and maintenance work has been carried out on a total area of 2,678ha of forestland.

6. Issues to be Considered

This is a long-term project which will be implemented over 23 years. Forest management also needs long-term planning and continuous effort. By achieving the targets, we believe that we could pass over the forests which could contribute to the public welfare (and preserve the water source) of future generations.

The following issues should be considered for achieving targets.

Securing stable funding for the steady progress of the project

Having capable institutions to ensure the smooth implementation of the project

Gaining understanding and co-operation from forestland owners

Under the terms of the agreement between the PG and forestland owners, the PG will preserve the forest plantations to develop them into multi-layered forests.

Subject: cedars and cypresses (21~50 years-old)

Period: Until trees will reach 70 years-old

Prepayment : 1.2 million yen/ha

Under the terms of the lease agreement between the owners and the PG, the forest plantations are preserved to allow development into mixed forests.

Subject: cedars and cypresses (over 11 years-old)

Period: 20 years

Rent: 27,000 yen/ha

The PG will buy important forests and water source areas for preservation. Purchased trees are aimed to grow for foundation of large tree forests.

Tree purchase: cedars and cypresses (over 40~50 years old)

Forest purchase: land and trees

When private and municipal owners agree to co-operate for forest preservation in water source areas, they are subsidised to cover a part of their expenses by PG.

Subject: cedars and cypresses (over 11 years-old), broadleaf forests

Restrictions: Indiscriminate felling for larger area than 2ha is forbidden.

Changing land use and indiscriminate felling within 5 years are forbidden.

Rate of subsidy: 10% (with other subsidies)

80%(no other subsidies)

Note: PG = prefectural government

Environment Recovery of River and Farming Community

Mr. Kim Eui Wuk, Director-general of Policy Planning of YMCA, Republic of Korea

1. Changes in Local Society and Rivers

1) Physical Changes to Rivers during the Process of Modernization and Industrialization

In 1960s, in Korea, rivers were changed from their natural state as part of the disaster prevention policy. When the rush for economic growth slowed to a steadier pace, people became interested in the problem of river conservation. Then the rivers were partly naturalized by creating parks on the banks for children to play in, or by removing concrete from the surface of artificial embankments.



In recent years, a strong consciousness of the need for humans to restore rivers to their natural condition has developed, and the target is now to create not naturalized or recreational park-type rivers, but ecological rivers. This is also the concept behind our river regeneration movement.

2) Changes in Political and Social Institutions and their Impact on Rivers

In the past, the rivers were managed mainly by government administrative authorities concerned with water supplies. But the urban and ecological functions of rivers require that not only bureaucrats but also the general public should participate in river management. The concept of 'ecological rivers' requires that the whole local area along the river should be transformed into a bountiful environment to be enjoyed by all living creatures.

3) Conflicts and Problems in Local Society

The basic problem in river regeneration is the intricate connection between the river and local interests. Disagreements are often apparent between different stakeholders. The dilemma between private concern for profit and public concern for nature conservation remains unresolved in the current Korean environmental protection movement.

2. A New Approach towards River Conservation

The emphasis in earlier schemes was to seek means of improving water quality and increasing water flow. These have been replaced by a more diversified approach, where soil and land use in the basin are taken into consideration so that the river can be regenerated.

This approach also recognizes the whole area in the basin as a single ecosystem which needs to be treated as a whole.

3. YMCA's 'River Regeneration Movement'

1) Operational challenges

Ever since the disaster that occurred in 1993, YMCA has been at the forefront of river rehabilitation activities. Rivers do not exist as a dumping ground for domestic or industrial wastewater. The main target of our movement is – apart from our obvious concern to improve water quality - to regenerate the area throughout the basin.

To promote such a movement, it is not enough merely to reveal the problems. To win sympathy and agreement of the general public, we cannot just point out individual culprits when a problem appears. Problems appear constantly, and people have rather short memories. Therefore our first challenge is to disseminate the awareness that these problems are directly related to ourselves, to our children and to our communities.

Secondly, because previously initiatives had been taken according to whatever issue was currently 'hot' and therefore tended to cool down and die, we now try to take a comprehensive approach, and to seek for fundamental solutions.

Thirdly, institutional reform is necessary. In Korea, there are six different laws related to river management, but in many ways, these are not consistent with each other. We think that the basic regulations should be amended.

Fourthly, in order to maintain sustainability of rivers, local residents must be ready to take charge. But until now, they have been mere spectators, just watching what was going on. Residents need to become stakeholders in the river management process, and to develop an adequate understanding of embankments, and of the construction and function of the water supply and sewerage system. Everyone should know how the river is managed and used. They must be conscious of their responsibility to protect their own rivers.

The fifth point is that a decentralized approach, where the central government allows the local communities to take charge of water supply and sewerage in their communities, is more effective for the regeneration of urban rivers. Water use policy must give priority to local residents in issues of water management and use. This will develop a close relationship between local people and their rivers, and will moreover foster a partnership between government and citizens.

Lastly, urban residents, who generally take little interest in rivers must be made to realize how closely their own lives are connected to them.

2) Basic Principles for Planning the Movement

First, our basic principle is that just as problems cannot be solved merely by picking up one 'hot' topic, and working on it, no single project to improve pollution in one single part of the river will contribute towards a fundamental solution. It is necessary to have knowledge of the condition

of rivers throughout the basin.

Second, the river regeneration movement involves problems between local governments. If they truly desire to solve the water problems, they must put aside their own interests over river use, and cooperate with each other to form a joint force.

Local residents also need to implant the idea that they are the masters of the river deeply in their consciousness, to replace the previous view that it is nobody's business as water flows. We call this idea 'water citizenship'. One of the most important aspects of the movement is to find people who share these ideas, and to harness their leadership in order to promote the movement.

3) 2002 River Trust Program

The 'River Trust Program' is a unique activity in which 'river conservationists' aim to act as wildlife representatives in order to give continuous protection to the wildlife in and around the rivers. The ultimate aim of this program is to preserve the ecosystem throughout the river system. The wildlife representatives will act as peace-keepers, maintaining the balance between the totality of water habitat wildlife on one hand and human beings on the other hand. By taking such an initiative, the details of which are provided below, our aim is not only to amplify the call for river conservation, but also to encourage individuals to become more active and to start making their own personal contributions, for example through combining their leisure activities and with conducting an environmental survey.

The Programs Undertaken by the River Conservation Trust

Areas where the Trust Conducts Programs

Andong-dong, Anyang, Busan, Chonan, Daejeon, Gimhae, Gumi, Gwangyang, Incheon, Jinju, Mokpo, Suncheon, Yeosu

Structure of the Trust

The main participating members are groups of junior high- and high school students who are interested in the issue, volunteer groups, university students' members from YMCA, family members from YMCA, and housewives' groups. The participants establish project teams (small groups of 5~6 people, family groups, or other action groups). Each group chooses a plant or an animal as its conservation theme, and maintain an interest in this theme in order to prepare to be able to become a leader to solve the related problems.

Symbol for Each Project Team

All the participating groups choose emblems from 12 species of animals and plants. Local governments have their own symbolic badges as royal families had in history – like the red and white roses of the English Houses of Lancaster and York – and as families and schools continue to have. These symbols encourage the members in their ecosystem conservation

activities.

Education

In the present era of life-long learning, there is an increasing appetite for education. General interest in ecosystem is also becoming stronger. By combining these two factors, it is possible to establish a life-long learning program as a daily recreation.

The Education Program of the River Conservation Trust aims at motivating the participants and strengthening the level of voluntary involvement. Through courses designed to develop understanding of the ecosystem, and to deepen knowledge of the wildlife, and by holding a joint workshop where solutions are proposed on the basis of surveys conducted by the participants themselves, the Program tries to develop the process of self-learning.

To support these educational programs, a standard core curriculum has been established. By adopting this, education systems have been developed for each project team according to the members' age or other features of the group.

Ideal educational programs include on-site learning so that the participants can see the results of the conservation activities with their own eyes. In some areas, participants who are not professional educators have been persuaded to take a leadership role in implementing the educational programs, and this, at the same time, both promotes voluntary participation and acts to spur interest. In fact, the proportion of professionals (like university professors and experts from related institutions) is decreasing, and a process of peer learning is taking shape.

Surveys and Research

Through ecological surveys on creatures chosen as emblems for project teams, along with the basic survey on water environment, enough fundamental data is obtained to enable us to implement conservation activities focused on the status of the habitat. Meanwhile the natural habitat of river creatures also needs to be assessed. The ecological movement needs to identify priorities, directions and concrete targets in order to promote a symbiotic relationship between all the living creatures.

Surveys and research activities can give local residents the chance to learn through experience. With the team emblems serving as a spur, these opportunities can have a direct impact on the members' willingness to continue their participation in the conservation process.

The survey programs so far established cover such areas as baseline data, the current conditions of the basin, water quality, waterside environment, and ecosystem. There are also thematic surveys, which cover ecological changes before and after the seasonal rains, the current conditions of the sewerage system, underground rivers, etc.

All the results from the activities have been recorded in the 'YMCA River Trust Field Notes'.

Survey and research activities can be combined with thematic on-site learning programs (culture, cycling, ecological tours, history, etc.) to make them more diverse.

Purposes of the action programs

Through conducting surveys and following educational programs, participants can identify measures which will protect the habitat of the species that they have chosen as their emblems. As a result, the citizens should take the chief responsibility for implementing the actions which will improve their local society.

Public awareness can be raised through activities such as the publication and exhibition of the project results, campaigns, and the choice of a particular species as a team emblem. An independent environmental investigation institute, or a cooperative joint-responsibility institution should be established to gain public trust. There should be the river supervision system: the administration should delegate river management to local volunteer groups.

Just as the river flows from upstream villages to downstream cities, a similar sense of connectivity should be created by joint projects which will enhance upstream-downstream exchanges, such as the introduction of organic farming and of cooperative movement.

(Note: This is a translation of a Japanese version of a Korean original.)

Medaka no Gakko Promoting 'Life-Rich' Paddy Fields

Mr. Nemoto Shinichi, Vice-Chairman, Medaka no Gakko, Japan

A Newborn NPO

Medaka no Gakko, literally 'Killifish School' was founded as an NPO (non-profit organization) in 2001 in order to promote naturally-plowed paddy fields for protection of nature, agriculture and health, and to familiarize children with this ultimate biotope. *Medaka*, the killifish, represents the diverse



life forms found in paddy fields. It is therefore as young as a newborn baby. The Chairman is a housewife and I, the Vice-Chairman, am a journalist who used to be in the publishing business. The board of directors includes such colorful members as a freelance writer, an architect designer, a brewer, a farmer, etc. But what they all have in common is knowledge of particular paddy fields through their different connections, and they have always cherished the idea of expanding these wonderful paddy fields nationwide basis.

A 'Life-Rich' Paddy Fields

In these paddy fields, many forms of life are born. When daphnia, chironomids and sludgeworms breed, numerous little creatures like loaches, fresh-water snails, frogs and dragonflies prosper from eating them. Soon locusts, grasshoppers and birds like swallows and herons come, too. In the end, the paddy field becomes a lively wonderland full of living creatures.

7% of the total area of Japan consists of paddy fields, where in most cases, rice is cultivated using agricultural chemicals and chemical fertilizers. As a result, living things have disappeared from there, and rice grows in a dead world. The promotion of profit-focused, life-destroying agriculture have led to the destruction of both the farming environment and the natural world.

Now, however, we have found a type of paddy field which can restore the bounty of the natural environment. It is what we call a 'life-rich' paddy field. Unlike most paddy fields, this one is not plowed. One of the instructors of this method is Mr. Nobuo Iwabuchi, Chairman of the 'Society for Promoting Non-Plowed Cultivation in Japan'. Year after year, Mr. Iwabuchi wondered why modern agriculture could not solve the problems of weeds and pests despite pumping chemicals into the land, and thought there must be a different way. One day when his eyes caught a forest, he realized that the big trees could grow and the beautiful flowers could blossom every year without the forest's being plowed. 'Trees and flowers can grow on

non-plowed land. Rice, like them, is also a plant,' he thought. 'Maybe rice can grow without plowing the paddy field.' As an experiment, he left a corner of a paddy field unplowed, and planted the rice. Sure enough, it did grow.

20 years have passed since then. He has established a 'Non-Plowed Cultivation' method which is completely opposite to modern approaches, having invented a technique of non-plowed cultivation which begins from creating seedlings. He also has developed a new machine for planting. When a paddy field is not plowed, straw and stubble from the previous year are left on the ground. The rice is planted there. Soon the straw in the water decomposes, and green algae appear, which produce much oxygen in the water by photosynthesis. The whole process does not destroy the habitat of microorganisms or small insects and animals, but produces an oxygen-rich environment, where a rich diversity of life forms can appear one after another.

Outreach to Primary Schools

The first step we took to promote these 'life-rich' paddy fields was to make a miniature paddy field in a foam polystyrene box (30cm × 50cm) for children so that they could have direct experience of the natural environment. First we fill the box with soil, and press it hard. Straw and stubble from the real non-plowed paddy fields are added. Then water is added; when the temperature rises, eggs of daphnia on the stubble begin to hatch, and the micro paddy field is soon full of them. Now we plant two rice seedlings. This is *taue* in Japanese.

Then we put some *medaka* supplied by neighborhood paddy fields into the box. After a month, in the micro paddy field, the eggs which these *medaka* had laid on the algae hatch, and a couple of dozens of baby *medaka* start swimming around, while rice grows steadily. Thanks to the abundance of oxygen in the water, the *medaka* can stay in good health in this over-crowded place.

Children in the 6th grade of one primary school near Tokyo tried the non-plowed cultivation of rice at a borrowed paddy field close to their school. At first, the place smelt, and children were reluctant to work in such a place. But after several months, when they went there for *taue*, everyone was astonished. Water has become clear. There was no smell. And the frogs sang to them!

The teacher told them that this was all thanks to the straw. Decomposed straw produced green algae which emitted oxygen into the water and cleaned the water at the same time. The children were very impressed by the power of nature.

Sending the Japanese Ibis back to the Wild

Medaka no Gakko introduced the non-plowed cultivation method for rice growing to Sado Island, Niigata prefecture. Sado was the last home to the Japanese Ibis, which was driven to extinction by over-capture, deforestation and widely-used modern farming methods that

depend heavily on agricultural chemicals and fertilizers. Its fate is a symbol of the environmental problem.

Currently there are 25 ibises in captivity in Sado. Many people in Japan including local residents of Sado or Niigata, hope to send them back to the wild in near future. Can Sado once more become an island where birds and people can live together? Everyone is watching Sado expectantly. 'Life-rich' non-plowed paddy fields could help ibises, too.

Responding to our new idea, in 2001, seven farmers went through the totally unfamiliar experience of non-plowed rice cultivation. Mr. Iwabuchi visited Sado many times to pass on the techniques to the farmers, and they made every effort to match his commitment. It was a success. The crop was 8 *hyo* per *tan* (576 liters per 992 square meters), which was quite good. The pioneers were all satisfied with their tasty rice. The chief of the village named this rice 'Tokihikari' ('Ibis Rice'). Most of it was shipped to the metropolitan area for sale.

The favorable result persuaded many other farmers, and in the second year, 18 of them took up the non-plowed method, which expanded the land worked by this method by 5 times. As early as in the second year, this way of growing rice thus got on track.

Talking to consumers is as important as persuading the producers. Unless the consumers in cities back up the farmers in Sado who have committed themselves to this campaign to return the ibises to nature, the movement cannot go further. This is where we, *Medaka no Gakko* come in, as a bridge between producers and consumers. We organize and host a variety of lectures, seminars, discussion meetings and other events in order to gain understanding and support from consumers. Besides their understanding and support, probably the most important thing is that they buy and eat this rice. The 'life-rich' paddy fields at the production end cannot expand unless urban consumers eat their rice.

To our joy, over the New Year period this year, NHK BS1 broadcast a 50-minute program on our activities entitled 'Life Returns to Paddy Fields'. This helped promote our 'life-rich' paddy fields. To restore the rich natural environment in Japan, *Medaka no Gakko* looks forward to traveling all round the country this year, too.

Restoration Movement of Anyang Stream

Mr. Yoon Yeo Chang

Director of Green Group21, Republic of Korea

Secretary-General, Managing Committee of the Aayang River Rehabilitation Network

1. Current Status and Conditions of the Aayang River

The Aayang River is the first branch of Han-Gang (Han River) running from Uiwang-Si, Kyonggi-do through the central Seoul including Guro-Gu and Yeongdeungpo-Gu. This river is 32.5km long, and among the branches of the River Han, it is the second biggest after the Jungryang River, and designated partly as national waterway and partly as local second-grade waterway.



The Aayang basin includes seven districts of Seoul City and seven cities of Kyonggi-do. The outflow channel reaches maximum length of 35.016km, the maximum length of the river system is 24.296km as the crow flies, and total surface area is 268.35km².

As of 2000, 5.5 million people (2.5 million in Kyonggi-do, 3 million in Seoul) live in those 14 local administrative districts. It is estimated that directly along the Aayang River, there are 3.8 million residents. The land use along the river includes paddy-fields (8%), other farmland (10%), forestland (36%), residential area (19%), factories (3%), and others (24%). Uiwang-Si has the highest rate of forestland area (72.1%) followed by Gwacheon-Si (60.7%) and Aayang-Si (50.6%). A high rate of residential area was found in Yeongdeungpo-Gu (90.8%), Gangseo-Gu (83.7%) and Dongjak-Gu (78.3). There are 51 cultural heritage sites altogether along the river. The area is also important in terms of transportation, and provides the major highways of the country. Therefore the number of cars owned by the residents here is high (1,229,116, according to 2001 statistics).

The closest monitoring station to the Aayang River recorded the average temperature as 12.3 , rainfall as 1,401.7mm, relative humidity as 69.5% and evaporation as 1,104.8mm, over 12 years since 1990, which reflects the general trend of climate in Korea. From its headwater in Baegunsan (Mount Baegun), Uiwang-Si, the Aayang River runs towards northwest through the lowland of central Aayan-Si.

There are 187 plant species (both indigenous and naturalized), 54 of aquatic creatures, and 23 of fish in the basin. Diversity of fish – such as carp and black bass - can be seen only in upstream areas: it is home both to types of fish that live in clean water, and those adapted to polluted water. In the other parts of the river, crucians that can live in relatively dirty water are the main fish to be seen. The area is visited by a variety of

migratory birds including mallards. In 2002, 2,500 birds came. Establishing a bird sanctuary has been often discussed.

In most areas, riverbanks are lined with concrete and facilities in the river are also concrete-made. The concrete means that the riverbanks are no longer an 'ecotone' (transitional zone between different ecosystems) where the soil meets water. There are some constructions with environmental consideration in upstream areas, but usually they function as embankments. If there is enough space, these banks can be used for habitat for animals and plants, or for residents' recreation as a waterside amenity. Currently they are used for car parks and sports grounds. Some local governments make use of them for flowers and plants.

Since 1994, the water quality of the Aayang River has considerably improved, but in many parts, it is still unsatisfactory. The annual average value of BOD in 2002 was 10.3ppm. Although this shows some improvement, the condition in the dry season is seriously bad. The sludge deposited on the riverbed contains heavy metal from wastewater discharged by neighboring factories, which is one of the main obstacles against improving water quality and restoring the eco-system.

The amount of wastewater, causing pollution in the Aayang River, was recorded in 1998 as 1,569,263m³ (1,459,044m³ household, 109,974m³ industrial, 245m³ from agricultural). This wastewater is treated at two wastewater treatment plants (4.8 million tons per day). When the upstream sewer system and another treatment plant (to be completed in 2004) start functioning, most wastewater flowing into the Aayang River will be treated properly, and water quality is expected to improve considerably.

2. Why is the Aayang River Rehabilitation Plan necessary?

There are three major problems related to the Aayang River. First, it is not providing a good habitat for animals and plants because the riverbanks are covered with concrete. Second, even if wastewater flowing into the river is treated, because the river has lost its self-cleansing capacity, it is unlikely that the river can be rehabilitated naturally to a level capable of nurturing life. The third is that because rainfall drainage and sewerage systems are not properly separated, in the Aayang basin, except in the rainy season, almost all rainfall is treated at wastewater plants. This causes water shortages in some areas, which leads to further restriction on the self-cleansing capacity of the river, and in some cases, to disputes among local residents over available water.

The Aayang River Rehabilitation Network has been lobbying to establish an 'Aayang River Rehabilitation Plan', and has conducted several activities. The Network suggests that first, an extensive ecological survey should be conducted throughout the whole basin, secondly, the Aayang River Rehabilitation Plan should be established in cooperation with neighboring local governments, thirdly, even before this Plan is

inaugurated, the local governments in the area should jointly start projects to improve the condition, and lastly, through citizens' participation, a law for river rehabilitation should be pursued.

Solving the problems requires cooperation between local governments. Up to now, the river management has been confined to wastewater treatment and flood control. In order to rehabilitate the concrete-lined river to a 'natural' river full of life, cooperation and joint projects by the local governments along the river will be vital. For example, water purification facilities using water plants like reeds, or various types of man-made marshes will contribute to the water quality improvement. To prevent the urban rivers from drying up, a long-term plan for constructing an appropriate sewerage system, and also a plan to protect diminishing groundwater resources are necessary. Support from, and participation of, local residents are especially important.

3. Activities of the Aayang River Rehabilitation Network

Along the Aayang River, there are several industrial areas such as the Gunpo Industrial Estate in upstream and the Guro Industrial Estate in Seoul. In these areas, industrial wastewater started to flow into the river while the riverbanks were covered with concrete, both of which were causing water pollution in the river. In early 1990s, as environmental problems were attracting general public interest, the Aayang River became a focus for citizens' groups. In late 1990s, this movement went beyond a mere matter of interest, and a variety of activities started. These include an ecological survey, regular watch organization, policy-making forum, etc., and participants became diversified to include young people, housewives, school teachers and local residents. It has been recognized that the citizens' groups across the Aayang river basin should cooperate. In November 1998, 19 private organizations established the 'Aayang River Rehabilitation Network for Citizens' Organizations'. The following list shows the projects the Network has conducted.

- Inauguration workshop (Nov. 24, 1998)
- Water quality survey along the whole river and mapping (1999)
- Survey throughout the river basin (1999)
- Symposium (Nov. 1999)
- Workshop to promote the Network's activities (June 2001)
- Survey on environment and eco-system of Aayang River, guideline (2001)
- Home page (2001)
- Participation in the workshop for drafting a Guideline for rehabilitating riverbanks and marshes (November 2001)

Meanwhile some other institutions including the Agenda 21 Promotion Institute and private companies started to join, and the local governments in the area have also been

making efforts. The Special Council for Water Quality Improvement cannot conduct specific projects, but local authorities of Aanyan-, Gunpo- and Uiwang- Si have all started to discuss river rehabilitation projects. Model project areas have been designated, water quality improvement projects have been started, and programs for planting reeds or rape flowers, and for building cycle-tracks have been implemented. Recently the media have reported enthusiastically that migratory birds had been seen flying around the Aayang River, and that fish have also come back to the river.

Based on these successful results, in March 2002, the Network made a new start with a new name, the 'Aayang River Rehabilitation Network' with participation of Agenda 21 Promotion Institute and private companies. Kyonggi-do implemented the 'Project to Establish the Aayang River Basin Rehabilitation Plan' in 2002. The following list shows the main activities in 2002.

- Home page, internet newspaper, monitoring
- Video for educational purposes
- Detailed survey across the whole Aayang River area
- Survey Guideline for Environment and Eco-System II

4. Significance of the Movement

In July 2002, a representative from the Network participated in an event held in Japan, and gave a case-study presentation of the Aayang movement. The most important point of this case is how 14 local governments with separate administrative systems can cooperate with each other in order to rehabilitate a river seriously damaged and polluted by industrialization and urbanization. While rapid urbanization through industrial progress was proceeding in 1960s, many parts of the Aayang River basin were covered with concrete. Because these areas along the river adjoin metropolitan Seoul, after industrialization, they became administrative districts with the Aayang River as boundary. Thus the River has been identified merely as a marginal boundary, and its badly-polluted condition has driven people away from it. The rehabilitation of the Aayang River was in fact more than just improving its water quality. It means protecting water, without which humans cannot survive, while at the same time recognizing what important roles the Aayan River plays as a focus for everyday life. When we see the status of this precious water after urbanization and industrialization, it shows us the reality that 21st century Korea will have to face. Therefore the joint force of local residents, administration, private companies and NGOs for regaining the natural power of the Aayang River is not aiming only at the rehabilitation of the river, but in fact, it tries to retrieve a part of the original human habitat, and to restore our human status as a member of the natural ecosystem.

(Note: This is a translation from a Japanese version from a Korean original.)