



Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education

March 2008



Ministry of the Environment
Government of Japan

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Table of Contents

INTRODUCTION.....	3
CHAPTER 1: VISION FOR ENVIRONMENTAL LEADERS – MODEL OF ENVIRONMENTAL LEADERS FOR ASIAN SUSTAINABILITY	4
1. VISION FOR BUILDING A SUSTAINABLE SOCIETY	4
2. THE ROLE OF HUMAN RESOURCES INVOLVED IN THE ESTABLISHMENT OF SUSTAINABLE SOCIETY	8
3. TARGET GROUP IN THIS VISION	10
4. THREE PREREQUISITES REQUIRED FOR ENVIRONMENTAL LEADERS	13
5. ENVIRONMENTAL LEADERS REQUIRED IN DEVELOPING COUNTRIES OF ASIA	16
CHAPTER 2: THE FUTURE DIRECTION OF THE DEVELOPMENT AND UTILISATION OF ENVIRONMENTAL LEADERS IN ASIA	18
1. CURRENT STATUS OF ENVIRONMENTAL LEADER DEVELOPMENT IN JAPANESE UNIVERSITIES	18
2. CURRENT STATUS OF ENVIRONMENTAL LEADER DEVELOPMENT IN ASIAN UNIVERSITIES	23
3. CURRENT STATUS OF ENVIRONMENTAL LEADER DEVELOPMENT IN EUROPEAN AND NORTH AMERICAN UNIVERSITIES	25
4. TOWARDS EFFECTIVELY DEVELOPING ENVIRONMENTAL LEADERS IN UNIVERSITIES	28
5. CURRENT STATUS OF ACCEPTING IN SOCIETY OF ENVIRONMENTAL LEADERS DEVELOPED IN UNIVERSITIES	32
6. CHALLENGES TO INHERING ENVIRONMENTAL LEADERS INTO SOCIETY	34
CHAPTER 3: THE PROMOTION OF ELIAS (ENVIRONMENTAL LEADERSHIP INITIATIVES FOR ASIAN SUSTAINABILITY) IN INDUSTRY – UNIVERSITY – GOVERNMENT – CIVIL SOCIETY COLLABORATION	36
1. ACTIVITIES FOR ENVIRONMENTAL LEADER DEVELOPMENT IN UNIVERSITIES	36
2. BUILDING SYSTEMS FOR UNIVERSITIES, CORPORATIONS, NGO/NPOs AND GOVERNMENT TO COLLABORATE FOR ENVIRONMENTAL LEADER DEVELOPMENT	48
3. TOWARDS DEVELOPING ENVIRONMENTAL LEADERS IN ASIA	53
4. PROACTIVE ACTIVITIES FOR PROMOTING ENVIRONMENTAL LEADER DEVELOPMENT IN UNIVERSITIES	56
LIST OF COMMITTEE MEMBERS	58
MINUTES OF COMMITTEE MEETINGS	59

Introduction

Environmental problems and consumerism as a result of the rapid economic development and industrialisation in Asia have been affecting global sustainability. Urgent actions are necessary for tackling such challenges. While responding to such issues, social and economic systems and land use need to be reformed to promote a sustainable society by achieving low-carbon, sound material-cycle, and nature symbiosis with a long-term perspective. To do so, human resources who change current economic systems and internalise environmental conservation are essential.

Under the 21st Centennial Environmental National Strategy launched in June 2007 and Innovation 25, the need for human resources achieving a sustainable society was highlighted. At the East Asia Summit (EAS) in November 2007 and the Tripartite Environment Ministers Meeting (TEMM) in December 2007, the needs for environmental leader development in Asia, and the urgency of cooperation between Asian countries were underlined.

Accordingly, the “Committee on the Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education” by the request of the Ministry of the Environment has discussed the concepts of environmental leader development to change society and economy to achieve a sustainable Asia, and compiled as a vision of environmental leader development. During the discussion period, over 200 stakeholders from universities, corporations, NGO/NPOs, and governments working towards sustainable society have joined to incorporate the voices from the field. We would like to thank those who have made efforts and contributions to this Vision.

We expect that this Vision will be utilised as a policy document for developing environmental leaders in higher education towards achieving a sustainable Asia in the future.

Chapter 1: Vision for Environmental Leaders – Model of Environmental Leaders for Asian Sustainability

1. Vision for building a sustainable society



(1) Environmental and socio-economic status in Japan

Current environmental issues in Japan

Due to the high level of economic growth in the past, Japan underwent environmental challenges such as industrial pollution and noise and gas emissions from the transport sector including airplane, trains and automobiles. The government and business then began to work towards pollution abatement. As a result, pollution issues have been gradually mitigated. Lately, an increase in waste generation and CO2 emissions has become priority environmental challenges and has been causing impacts around the country and the world. Mechanisms and institutional systems have been developed for recycling industrial and municipal waste, and for reducing CO2 emissions.

Model for sustainable society

In June 2007, the 21st Centennial Environmental National Strategy was launched. The Strategy indicated the policy direction for Japan to take a leading role in realising a sustainable society at the global level. The Ministry of the Environment has developed the “Super-long Term Vision” that presents a future vision for 2050. The vision consists of three models: a low-carbon society, a sound material-cycle society, and a natural symbiotic society, and provides a long objective of reducing greenhouse gases emissions by 50 percent by 2050.

Image of Sustainable Society in 2050	
Vision A: High-tech based Society	Vision B: Ecologically co-existing society
Urban/Individual-valued	Decentralised/Community-valued
Mass production Use of recycling technology	Locally-produced/consumed Produce only what is needed
Convenience focused	Social & cultural values appreciated
 <p>GDP growth per capita 2%/year</p>	 <p>GDP growth per capita 1%/year</p> <p>Akemi Imagawa</p>
<p>Sectors of industry</p> <p>Primary: reduced share, dependent on import Secondary: high value added, oversea production Tertiary: increased share, improved productivity</p>	<p>Sectors of industry</p> <p>Primary: recovering share in agri-forestry-fishery Secondary: local brand, diversified production Tertiary: increasing share, volunteer promoted</p>

Source: Based on Central Env. Council the 5th meeting for 21st century Env. National Strategy

To achieve a sustainable society by 2050, the domestic industrial model must be reformed. The primary industry sector such as forestry needs to be revitalised, and the secondary and tertiary sectors need renewed systems for achieving high environmental efficiency in businesses.

Furthermore, social entrepreneurs and NGOs play an important role in the realisation of a sustainable society. It is required to develop the industries that create and promote social and technical innovation in various fields, generate low impacts on the environment, and contribute to environmental conservation.

Column: The 21st Centennial Environmental National Strategy

A strategy that indicates the direction of Japan’s environmental policy decided in cabinet on 1 June 2007. This is a strategic approach towards “Environmental Country Japan.” It aims at establishing a “Japanese model” for achieving a sustainable society based on the concepts and tradition of nature symbiosis, excellent environmental and energy technologies, experiences recovering from pollution issues, and rich human resource. Using such strengths, it contributes to the development and prosperity of Asia and the world through the environment-dependent economic development and community revival. Sustainable society can be achieved by integrating “low-carbon society,” “sound material cycle society,” and “nature symbiosis society.”

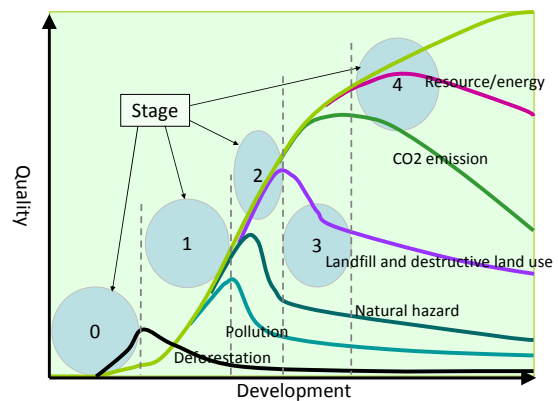
(2) Environmental, social and economic status in Asia¹

Context of environmental issues in Asia

Developing countries in Asia vary in the level of development. Each country has faced different environmental issues caused by different ecological conditions. From such a view point, Asia can be categorised into two types: the countries at the advanced stage of economic development and the others at the inceptive stage of economic development.

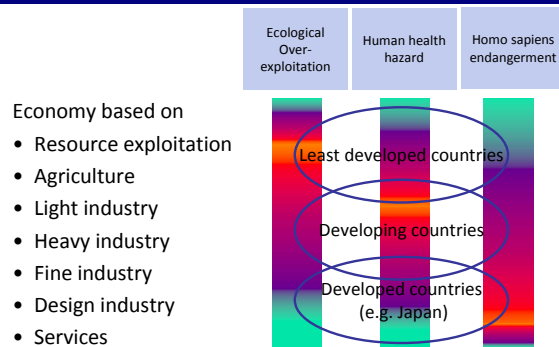
In Asia, environmental issues occur across borders of several countries such as water quality degradation and cross-border air pollution in the national river. Even within the same country, the situations in the country side and urban city, or in remote islands are different. Considering the contexts of environmental problems in Asia, both approaches that recognise Asia as one region, and examine each local problem are important.

Furthermore, a common issue among developing countries in Asia is that although local point-source problems are taken care of, global environmental issues have not been sufficiently addressed.



Source: Based on Yasui at the 5th meeting for the vision

Sustainability Risk based on development level



Source: Based on Yasui at the 5th meeting for the vision

¹ Asia in this Vision indicates North-east Asia, East-south Asia, South Asia, West Asia, and the Pacific regions.

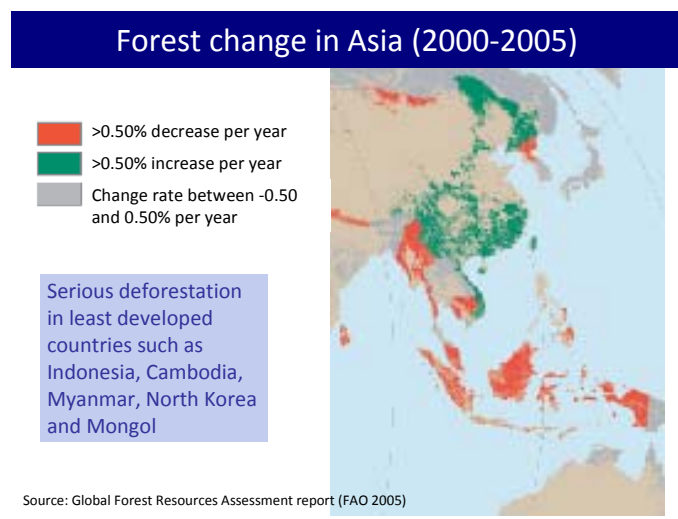
The current status of environmental issues in the countries that are at the advanced stage of economic development in Asia

Asian developing countries with advanced development have faced rapid urbanisation and industrialisation with inadequate infrastructure resulting in the problems concerning air and water quality and land use. The introduction of the lifestyle of developed countries, especially in major cities in Asia, has accelerated energy consumption and an increase in waste generation. CO2 emissions affecting global warming are significant in the countries, which show rapid industrialisation and economic development.



The current status of environmental issues in the countries at the inceptive stage of economic development in Asia

In less developed countries in Asia, typical environmental issues include over-exploitation of natural resources, forest destruction, poor water quality caused by disorderly development, and waste transfer from other countries. These issues are caused by imbalanced trade and poverty issues. Island countries like Indonesia and the Philippines and developing small countries are especially vulnerable to climate change. Their small economy makes the development of export industry difficult. They need to establish their own waste management systems.



Predictions based on the current status in Asia

Environmental issues emerging from poverty, urbanisation, industrialisation, over-consumption, and restrained governance. They impede the achievement of sustainable development.

The Asia-Pacific Forum for Environment and Development (APFED)² and the Asia-Pacific Environmental Innovation Strategy Project (APEIS)³ have demonstrated changes in the environment in and various social situations in Asia. In the outcome of these undertakings, it is stated that Asia accounts for half of the total population in the world and continues its rapid economic and industrial development that exacerbates air and water pollution, deforestation, greenhouse gas emissions, and the loss of biodiversity. As a result, there is a major concern about the social and economic impacts and uncertainty for sustainability. While high economic development is required to tackle poverty issues, industrialisation results in population growth, income gaps, rural-urban migration, and the loss of natural resources.

The IPCC Third Assessment Report, which projects environmental situations in Asia by 2050, indicates the vulnerability of freshwater supplies, increasing risk of flood in mega-delta areas, rapid urbanisation, industrialisation, economic development-induced impacts on natural resources, problems related to infectious diseases due to extreme precipitation and drought. Adaptation to climate change is expected to be a priority issue in Asia.

(3) Gaps in political and educational priorities in Asia

Even when the environment and the establishment of sustainable society is considered important, poverty relief and economic development are still political and educational priorities. In reality, the budget and resource distributions for environmental issues and sustainability are not sufficient. Considering the current situations and the projected future of a sustainable society, Asian countries, including Japan, need to prioritise sustainability issues in their policy and education and bridge the gaps between specified tasks and real actions.

² The forum aims at proposing models for sustainable development that is balanced and suitable for Asia and the Pacific. The final report was adopted in 2004 and programmes for supporting the implementation of recommendation have been launched thereafter.

³ The Research Project aims at providing innovative policy options based on the scientific framework for the environment and development to support decision making for sustainable development in Asia and the Pacific.

2. The role of human resources involved in the establishment of sustainable society

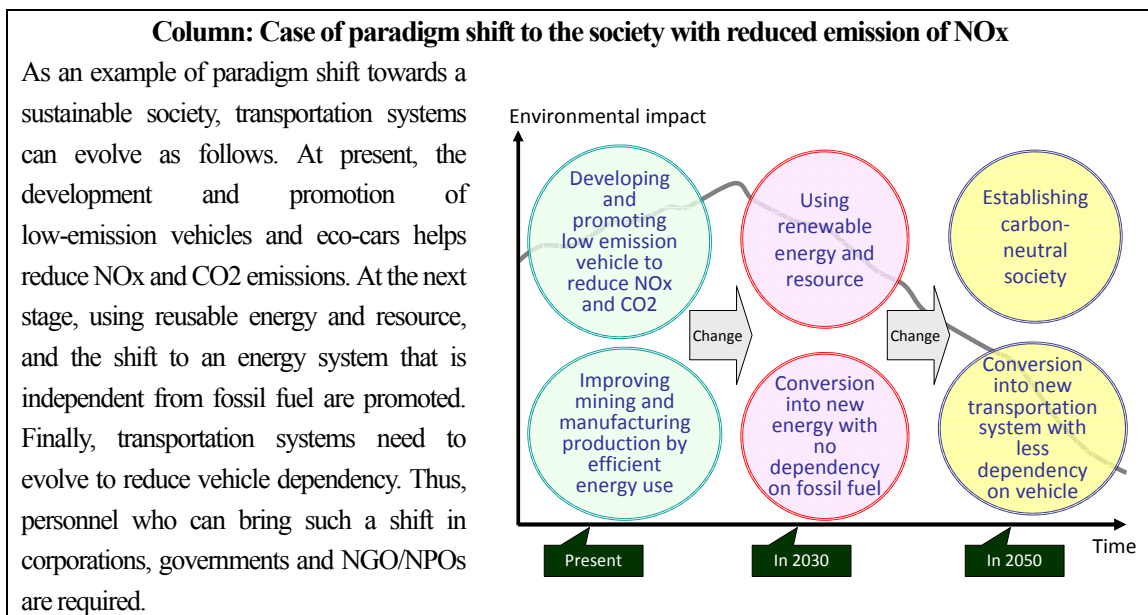
(1) Paradigm shift towards a sustainable society

To halve GHG emissions by 2050, reforming conventional social and industrial systems into low-carbon society, material-cycle society and symbiotic society is urgently required.

To do this, social and economic systems, which can reduce resource and energy consumption, need to be established while maintaining quality of life.

For example, it is vital to promote renewable resources, shift from possession to sharing or use services, and minimise energy use.

Adequate use of natural resources, operation of agriculture, forestry and fishery by protecting and conserving biodiversity, recycling resources, and the promotion of natural energy use are all necessary to realise a sustainable society. Furthermore, changes of industrial systems by linking the stages of material cycle including production, transport, product use or consumption, and dismantling or reproduction, using domestically produced renewable resources are needed. Human resources need to play their role not only in their field but also beyond the boundary of the primary, secondary and tertiary sectors of industry by promoting seamless collaboration for supporting sustainable economic activities.



(2) Use and promotion of traditional knowledge of Asia

To realise the paradigm shift mentioned in (1), the link among economic development, changes of society and environmental degradation needs to be focused. However, the focus should not be on the scale of economy and resource availability, but on embedding over the long term the concept of sustainability through education in the unique values that Asian countries have.

In Asia, there is a belief that humankind is part of nature and is sustained by nature. The culture of “knowing how much is enough” and traditional knowledge, ethics and techniques are used and passed on. Discovering such knowledge, ethics and techniques and re-establishing them in a modern way is quite important to proceed with the activities aiming for sustainable society.

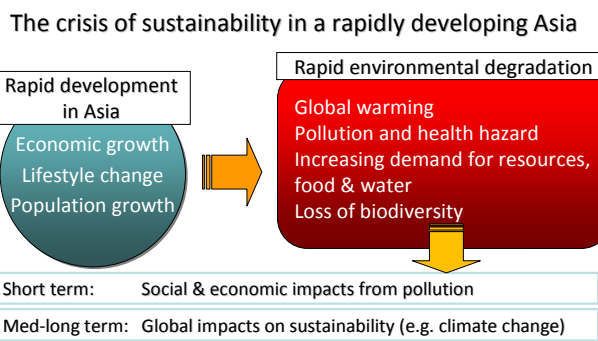
Column: Approach of “Sufficiency Economy” in Thailand

“Sufficiency Economy” is a philosophy proposed by His Majesty King Bhumibol Adulyadej after the economic crisis in Thailand in 1997. It aims at the relative degree of economy development and growth. It suggests that the economy should grow reasonably, and an individual should lead a reasonably comfortable life without excess to establish a resilient and flexible society. Such a situation sustains the individuals’ life. An individual should learn reasonable satisfaction. Under the principle of Sufficiency Economy, industries should be able to reduce costs, manage risks and develop human resources. Furthermore, they should be able to contribute to civil society with the development of product values and quality, and the provision of know-how to local communities.

(3) Action from the global view

It is necessary to have a long-term view with actions towards sustainability in economy and society at a global level. Developing the knowledge and techniques of environmental conservation across the world, and disseminating, sharing and promoting local activities to / with other communities is especially important.

Thus, to produce and promote useful values, knowledge and techniques for establishing a sustainable society in each local community on a global scale, environmental leaders who develop the knowledge and techniques of environmental conservation need to increase and work globally.



【Perspectives on sustainable development in Asia】

1. Paradigm shift in social & industrial systems for low-carbon society, material-cycle society & symbiotic society
2. Use and promotion of Asian traditional knowledge such as the perception of symbiosis in nature
3. Real action with global and long-term perspectives in various fields and industries

3. Target group in this Vision

The establishment of systems, technology and business is important, but only humans can realise it. Japan proposed that from 2005 until 2015 should be the United Nations Decade of Education for Sustainable Development : UN DESD, at the Johannesburg Summit in 2002. In this Vision, we propose the concept of “environmental leader” based on two types of human resources for a sustainable society.

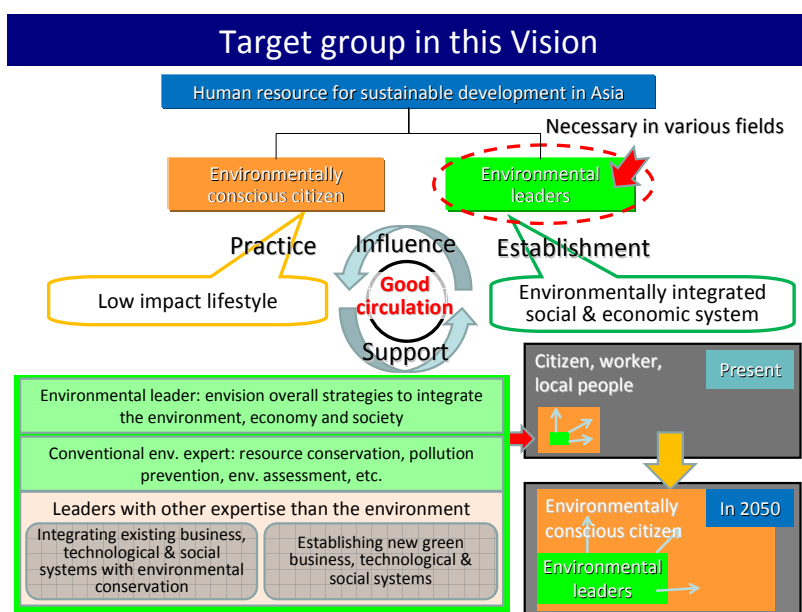
(1) Producing human resource for Asian sustainability

Human resource for Asian sustainability is divided into two categories.

First, a citizen who as a consumer is aware of environmental conservation, chooses low-impact products and services, and practises one’s sustainable lifestyle. Such a citizen is here called an “environmentally conscious citizen”. Conventional environmental education (EE) focused on producing the environmentally conscious citizen, and it should be further promoted.

However, in addition to educating the environmentally conscious citizens, socially and economically well designed products and services also need to be supplied for citizens. The systems and policies that improve low-impact as well as socially and economically advantageous products and services need to be developed. Environmental leaders who design a comprehensive social and economic system including business, technology and policy are also required.

An environmental leader is defined as a person who **considers the importance and urgency of solving environmental problems based on one’s own experience and ethical thinking, has strong motivation to build a sustainable society and to realise integrated development in the environment, society and economy through business and civil activities by using one’s expertise, and takes leadership role on innovative social changes.**



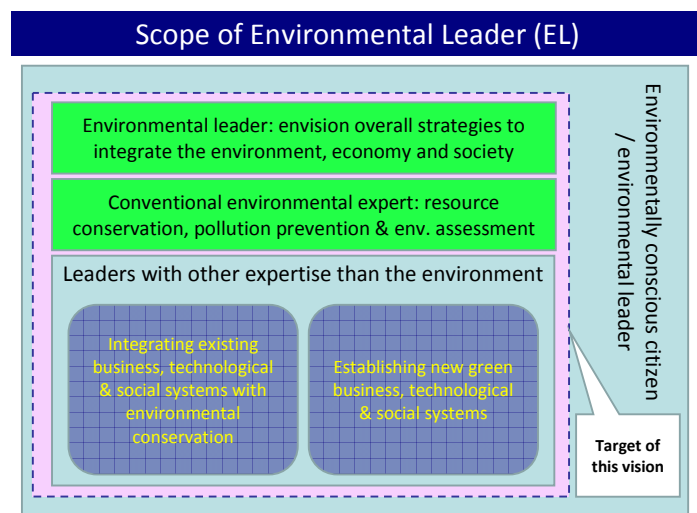
The sustainable society will not be achieved without either of environmentally conscious citizens and environmental leaders. With the support of environmentally conscious citizens, environmental leaders can deal with low-impact business models, technology development and policy development. With the products and services, and related policies provided by environmental leaders, environmental citizens can exercise low-impact lifestyles. At present, the proportion of environmentally conscious citizen and environmental leader among the total population is still limited, but it is necessary to promote a sound cycle of social systems that produce both groups to realise a low-carbon society by 2050.

(2) Categories of environmental leaders

We need environmental leaders who integrate the views of environmental conservation and social and economic development, creating and promoting social and technological innovation in various fields.

Environmental leaders are divided into three based on their expertise.

- Environmental leaders who envision and practise comprehensive strategies, integrating the environment, economy, and society
- Environmental experts who have skills and knowledge of nature conservation, pollution prevention, environmental management, and environmental assessment
- Leaders who specialise in other expertise than the environment (with abilities to integrate existing businesses with an environmental society or with abilities to establish new green businesses)



Environmental leaders who belong not only to the environment-related sections, but also to the other sections in ministries, corporations and municipalities should consider environmental conservation and sustainability issues. Corporations are also expected to integrate environmental mind into their business

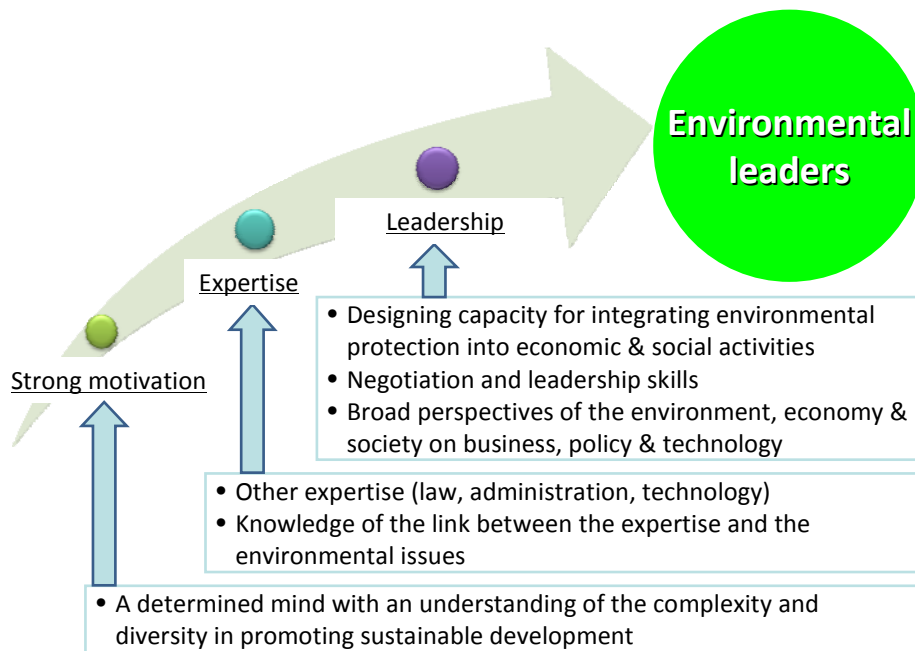
activities by allocating environmental leaders to the sections of design, manufacturing, and marketing.

Ability by types of expertise required for environmental leaders			
	Expertise	Particularly important ability	Common ability
Manufacturing	Agri. forestry	To perform, manage and market in environmentally-friendly agriculture such as organic farming	Basic knowledge Motivation on environmental conservation
	Fishery	To perform, manage and market in environmentally-friendly fishery	
	Construction	To design and perform long-term and environmental construction	
	Manufacture	To design and perform a new business model from material-based to service-based	
	Food	To envision business development to promote sustainable primary-sector industry	
Capacity development / system establishment	Education	To teach personnel demanded in the future	Action on integrating environmental values into economic and social activities
	Tourism	To plan and design new business-type tourism	
	Government	To envision systems and design policy for sustainable society	
	Finance/ insurance	To invest in environmental industry, and to plan and design financial and insurance products	
	Civil society NGO	To envision and perform toward sustainable society and to link to business activity	

4. Three prerequisites required for environmental leaders

The three prerequisites, i.e., “strong motivation to create a sustainable society,” “expertise,” and “leadership” are essential for the planning and implementation of concrete projects for a sustainable society.

Three prerequisites for environmental leaders



(1) Strong motivation for sustainable society

Strong motivation to create a sustainable society requires understanding of the complexity and diversity of environmental issues that involve various causes and effects through one’s profession and civil activities from economic, social and environmental aspects.

In Japan, let alone developing countries, environmental values are not sufficiently recognised in the current social and economic systems. It is not unusual that new initiatives for environmental conservation face oppositions and misunderstandings from both inside and outside of institutions. There needs to be strong motivation to tackle such oppositions persistently.

The following elements are required.

- The understanding of the current situation of sustainability and the importance of urgent approach and the motivation and morale to realise a sustainable society
- Strong motivation to participate in the development of a sustainable society and environmental conservation through one’s own profession and civil activities

(2) Expertise in contributing to the development of sustainable society

Expertise in contributing to the development of sustainable society involves the ability to integrate the knowledge of environmental conservation into one’s own expertise such as laws, administration and

engineering. Expertise here includes administrative skills like accounting, and is not limited to academic expertise.

For corporations, governmental agencies and local society, which do not deal with environmental conservation as a main objective, employing one's own expertise is essential. Manufacturing companies would expect good engineers and not necessarily are interested in environmental knowledge and skills, for example. In contrast, the fields where environmental leaders can employ their abilities are certain sections of an organisation that deal with a project integrating institution's objectives and environmental concepts. Environmental leaders need to have an ability to employ their own expertise for environmental conservation. The following elements are required.

- Expertise (e.g. law, administration and engineering other than environmental fields)
- Ability to demonstrate expertise for environmental conservation with the understanding of relationships between the expertise and the environment and society
 - To make a decision about the potential impacts of environmental changes on a society and industry, and to introduce a scheme based on the decision
 - To think strategically and solve problems to deal with environmental conditions and financial restrictions
 - To prioritise environmental issues based on risk analysis
 - To think critically based on one's own expertise
 - To apply expertise with environmental ethics

(3) Leadership

Finally, it is pivotal to have leadership, which proposes a project to improve environment, economy, and society comprehensively, addresses consensus-building, and conducts projects by managing an organisation. Such leadership is necessary to change an existing system and propose a new business model.

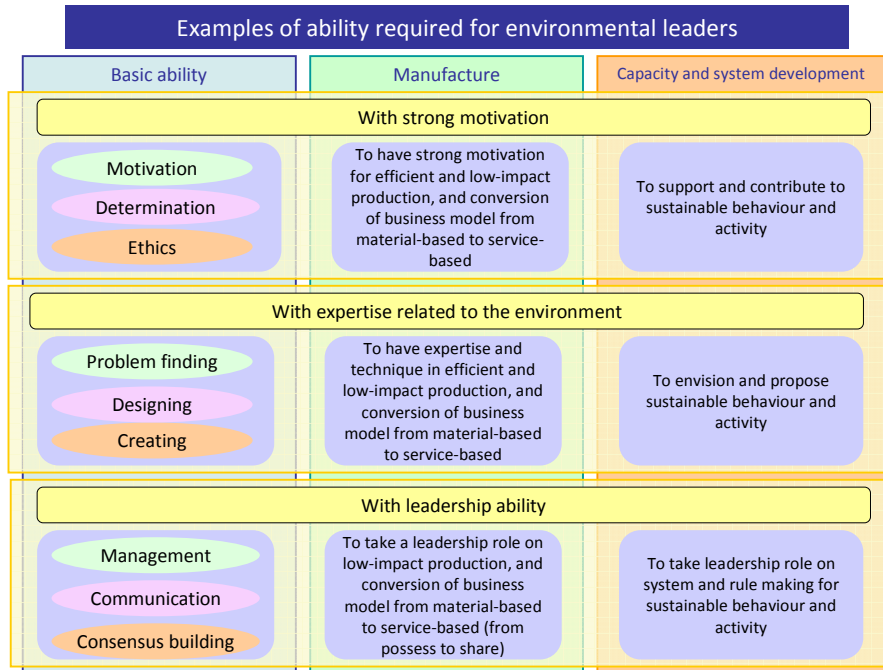
As mentioned in Section (2), the environmental value is not adequately recognised, differing from economic and social values. Moreover, such values are often seen as having a trade-off. In contrast, it is impossible to carry out any project such as business, technology development, and policy-making and implementation independently. Individuals need to take leadership roles in developing environmentally integrated projects, build consensus among stakeholders, negotiate with conflicting parties, and put into practice. The following are required leadership skills.

- Capability to design socio-economic activities which integrate the aspects of environmental conservation
- Capability to analyse various aspects of the environment, economy, and society
- Skills to develop consensus, negotiate and make joint decisions
- Ability to persuade related parties and manage an organisation
- Sincere attitude towards decision making, taking minority groups (e.g. disables and the poor) into

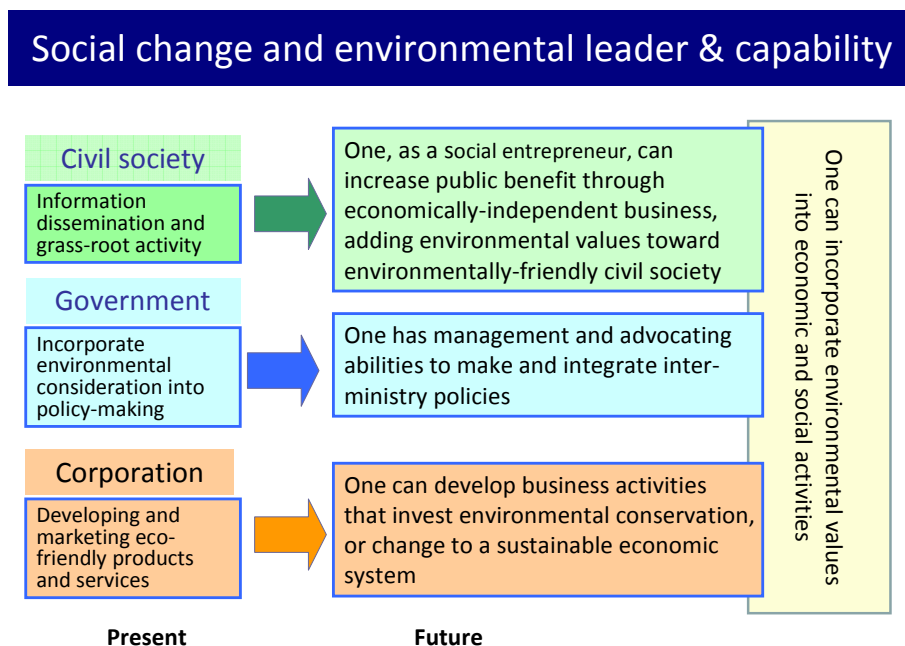
account

- International communication skills

The following figure presents what kind of capabilities the environmental leaders should have in different fields.



Capabilities of environmental leaders expected in each sectors (civil society, government and corporation) are described as follows.



5. Environmental leaders required in developing countries of Asia

An image of environmental leaders required on a long-term basis in Asia including Japan was discussed in Section 4. Environmental leaders required at different developing levels in Asia excluding Japan will be analysed here.

(1) Environmental leaders in developing countries of Asia

The improvement of environmental problems is stagnant in the developing countries of Asia. This is partly because there are not enough environmental leaders who are in charge of solving problems such as poverty, urbanisation, the growth of industrial production and consumption, and lack of governance. Therefore, the development of environmental leaders who can contribute to solution of environmental problems in Asia is an urgent issue. That is to say, it is necessary to conduct the development and utilisation of environmental leaders who can approach the challenges that the developing countries are facing and take appropriate actions.

The decision-making skills with environmental ethics to evaluate and judge the short- and long-term needs are generally essential for environmental leaders in Asian developing countries. In addition, instructors and educators who promote environmental knowledge, information and technology within a country are necessary.

However, required environmental leaders' abilities are different according to the level of economic development. The model of environmental leaders by level of development is described as follows.

Environmental leaders in developed countries and regions⁴ of Asia

In developed countries in Asia, it is essential to develop the human resources with the ability to build economic systems which have the consciousness of environmental restrictions. In these countries, although environmental regulations are being introduced, the execution is not fully achieved. Therefore, it is necessary to develop human resources with the ability to introduce the incentives for the implementation of policies and to manage effective economic activities. Moreover, there is a lack of engineers, needed to implement environment-friendly economic activities thoroughly, such as environment analysis and environment management. Thus, the experts in these fields are indispensable.

Also, people, who spot the most serious problems, monitor corporation and government policies and performance, and promote activities following the concepts of environmental conservation and sustainability, are required in these countries.

Environmental leaders in less developed countries and regions of Asia

In less developed countries in Asia, it is indispensable to develop human resources to solve the cause of

⁴ Regions here indicate areas in a country as well as regions over countries that are identified as at the same developing level

environmental problems such as poverty, and achieve a good balance between development and environment. Thus, the environmental leaders should seek solutions for these problems, give suitable incentives, which facilitate solutions, and carry them out effectively and efficiently. Such personnel are particularly important in central and local government. Furthermore, it is essential to produce engineers who are able to take accurate environmental measurements and transfer the skills and technique as educators.

Environmental leaders also need a judging ability to shift towards a sustainable society without experiencing serious pollution issues by introducing technology and systems with high environmental efficiency.

(2) Environmental leaders required in Asia on short- and long-term basis

In order to achieve sustainable society, environmental leaders are needed in the field of administration, government, companies, civil society, and consumers for urgent and on a short term basis. When looking at the environmental improvement of Asia in the long run, there is a difference between what the environmental leaders are required for in these fields on the short term basis and on the long run basis as shown in the following chart.

Environmental leaders expected in the long- & short-term			
		EL expected in developed countries in Asia	EL expected in developing countries in Asia
EL in the short-term	Required ability by developing level	<ul style="list-style-type: none"> ● Ethics to obey environmental rules and the ability to take action ● Technique to assess and monitor existing environmental issues and situations ● Ability to develop green technology that reduces environmental impacts 	<ul style="list-style-type: none"> ● Capability to acquire and maintain techniques that are corresponding to regional situation and can be used in environmental measurement ● Ability to give priority by environmental impacts and urgency, and take action ● Ability to deal with environmental conservation, taking social and economic issues like poverty into account
	Common	<ul style="list-style-type: none"> ● Ability to make decision on short-&long-term needs ● Ability, as an educator, to disseminate environmental knowledge, information and technology within a country ● Environmental ethics 	
EL in the long-term	Government	<ul style="list-style-type: none"> ● Ability to analyse social structure in developing countries based on their history of environmental conservation and economic development, culture, social system, and environmental regulations ● Abilities to make effective environmental policy and design the framework of incentives based on the unique situation of developing countries ● Skills to plan and make policy to prevent potential environmental issues that developing countries have experienced ● Ability to examine policy that integrates economic development and environmental conservation, avoiding economic development with poor environmental understanding 	
	Corporation	<ul style="list-style-type: none"> ● Ethics to obey environmental rules imposed by central government / municipality, and the ability to take action ● Technology and development of greening production and manufacturing processes ● Performance ability to introduce systems, products and services that reduce environmental impacts according to the level of development 	
	Civil society	<ul style="list-style-type: none"> ● Ability to acquire and succeed knowledge and technique that are necessary for achieving Asian sustainability ● Decision-making skills to prioritise urgent issues from integrated perspectives ● Judging ability to choose low-impact systems, products and services 	

(3) Environmental leaders expected in other regions

In Africa, Latin America and island countries in addition to Asian countries that have shown their economic development, environmental leaders who cope with climate change adaptation and a sustainable society meeting the economic developing levels are needed. The capacity and abilities required for the establishment of a sustainable society in Asia are also important in the regions of Africa, Latin America and island countries. There is a common goal of developing such human resources among Asian countries and other regions.

Chapter 2: The Future Direction of the Development and Utilisation of Environmental Leaders in Asia

1. Current status of Environmental Leader development in Japanese universities

(1) Development of environmental education (EE) and education for sustainable development (ESD) activities in universities

Activities of each school / department

Up to the mid 1970s, environment / sustainability related studies were centred on water / air quality control, waster management in sanitary engineering departments, and landscape / vegetation management in agriculture departments, studies related to pollution / nature conservation in physical science / engineering departments.

It is characteristic of this time that the conventional disciplinary academia was required to respond to pollution abatement measures. For instance, the then Ministry of Education commenced “the Environmental Science Special Research Programme” within the framework of the Science Research Grant in 1977, and continued the Programme until 1986 to support environmental research in universities.

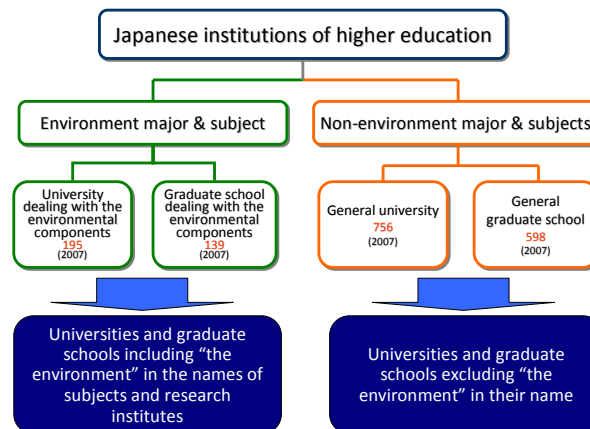
Reinforcement of EE in various school / department

After the mid 1970s, in physical science / engineering departments, particularly the engineering department and agricultural departments, environmental perspectives were being strengthened in specialised areas, and the number of department / school named after the environment increased.

In 1990s, the environment related schools were newly established in conjunction with the social science departments, and the increasing number of universities introduced environment related courses.

The background behind which EE started being strengthened in departments, divisions and schools include the increased need for studies on the environment after the Earth Summit in 1992, the universities’ proactive response to integrate environmental factors, and the progress in restructuring the university departments / divisions prompted by the dismantling of the Department of Education in accordance with the legislation on university establishment standards in 1991.

The number of university offering environmental components



In conventional departments such as economics departments or management departments, environmental subjects were introduced voluntarily in the seminar class, and thereafter, introduced as the courses that were officially acknowledged to provide credits. Inter-disciplinary courses were introduced as introductory courses, and the specialised courses were introduced such as environmental economics where conventional disciplinary science was applied to environmental subjects.

Establishment of interdisciplinary environmental school / department

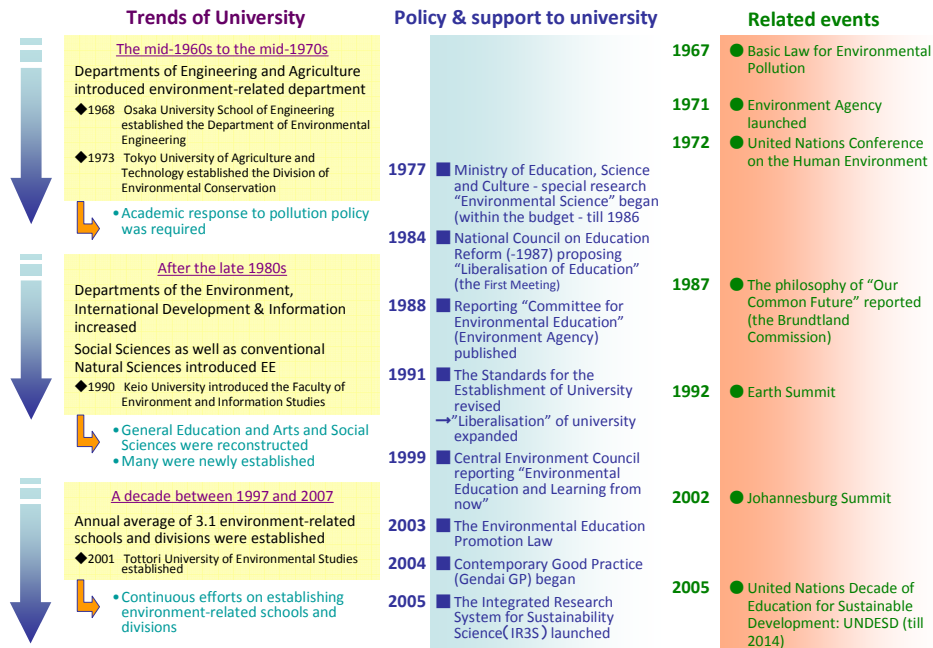
It is crucial to undertake interdisciplinary approaches for resolving environmental challenges. However, such approaches were not adequate as the conventional university education was focused on particular specialised areas and it was mainly intended to deepen and refine knowledge in such focused areas. For such reasons, it was proposed to promote knowledge acquisition on environment / sustainability from integrated perspectives, and to establish departments / divisions / schools that provide courses that integrate social and bio-physical sciences.

As the Ministry of Education launched the Modern Educational Need Action Support Programme (Modern GP) in 2004, and the Integrated Research System for Sustainability Science (IR3S) was established with the support of the Science and Technology Promotion Coordination Grant in 2005, the inter-disciplinary curricula were being devised for developing environmental leaders, and the inter-university collaboration was being institutionalised for undertaking cutting-edge sustainability education / research activities. At present, 169 universities have the departments / divisions that are named after the environment (26.1% of total), and 139 universities have schools and programmes that include the word “environment” in their name (National university directory survey conducted by IGES in 2007).

Column: Integrated Research System for Sustainability Science (IR3S)

As the FY2005 Science and Technology Promotion Coordination Grant project, leading universities and institute joined the IR3S that included five member universities namely University of Tokyo, Kyoto University, Osaka University, Hokkaido University and Ibaraki University, and six collaborating universities and institutes namely Toyo University, National Institute for Environmental Studies, Tohoku University, Chiba University, Waseda University, and Ritsumeikan University. The IR3S is intended to promote an integrated approach based on a wide range of inter-disciplinary expertise, to become a hub of a world top level network research on global sustainability and to undertake inter-disciplinary research and education on sustainability by addressing various risks of global warming, recurrent extreme weather events, ozone layer expansion, disturbance in ecosystems, increased endangered species, soil / water / marine pollution, food security, energy source depletion, population growth and food supply shortage.

History of Environmental Education (EE) and ESD at higher education

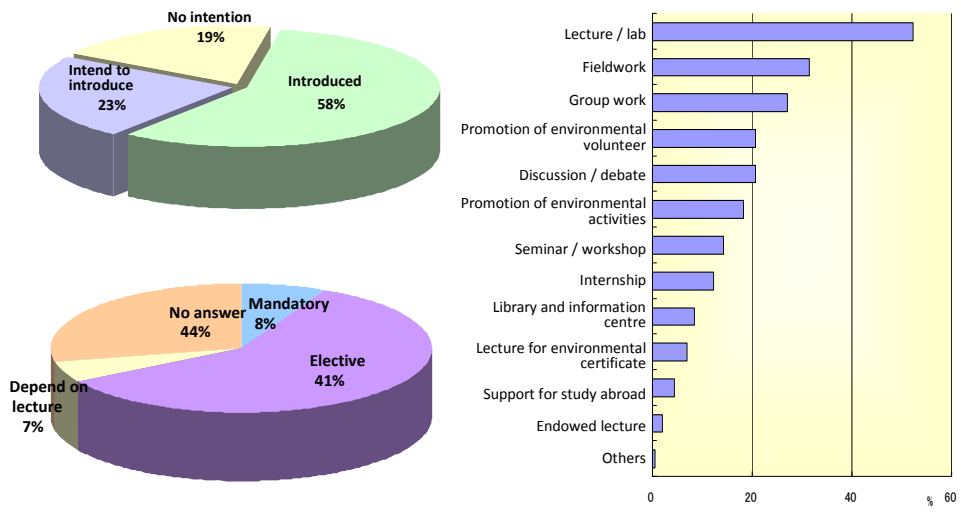


(2) Current Status of EE and ESD

According to a questionnaire survey (conducted by IGES in 2007), about 60% of universities provide environment-related courses in general education (standard education). While many universities provide environmental courses in basic education, they are mainly in the form of non-compulsory lectures and seminars. In interview surveys, it was pointed out that the due to the large number of students attending the course, the course is given to provide information in the lecture style in a large classroom and as a result, it has not yet been integrated and levelled up towards developing the strong motivation and leadership skills that are required for environmental leaders.

On the other hand, more than half of the universities have established environmental related courses in the specialised education. Fieldwork and field studies are used to address environmental subjects, and a variety of lectures, seminars, group works, discussions, and debates is used. It is expected that students will acquire specialised knowledge and skills on the environment / sustainability through these courses of fieldwork and field studies that are deemed as effective in obtaining expertise in specialised areas.

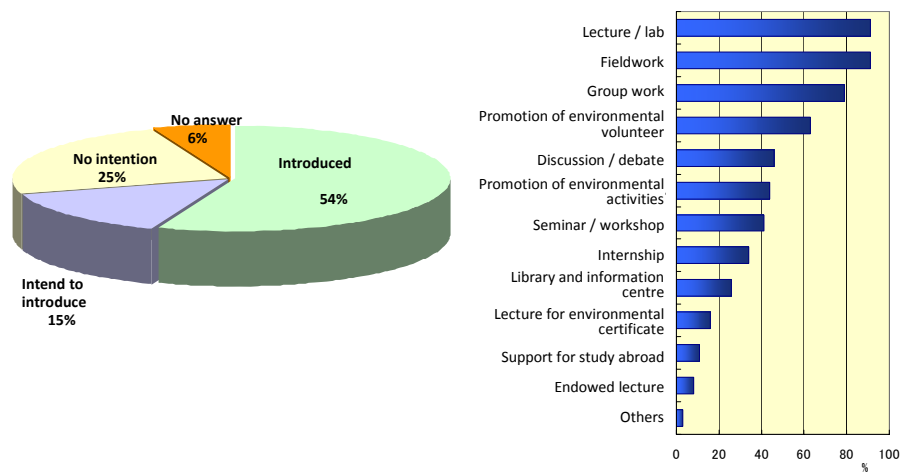
EE in General Education



Source: IGES (2007) University questionnaire survey

Other than those mentioned above, minor systems are introduced to supplement specialised studies and to enable non-environment major students to study environmental subjects. In addition, *ad hoc* lectures and seminars are offered apart from the year-long or semester long courses, and provide opportunities to learn environmental subjects in a voluntary and proactive manner in some universities.

EE in Specialised Education



Source: IGES (2007) University questionnaire survey

(3) Current Status of Pedagogy for EE and ESD

As for the pedagogy for EE and ESD, knowledge acquisition methods are a dominant pedagogy in general education. On the other hand, at some universities, a programme that emphasises the importance of experience has been introduced in order to provide motivation and training towards working for environmental conservation and sustainability.

Such experiential (“hands-on”) programmes are provided to promote proactive participation in the form of group case studies, debates based on hypothetical cases, hypothetical role plays within the lectures and seminars for transferring knowledge. In addition, other activities are also provided such as visits to the field to observe and experience real conditions and phenomena through field studies and work, and internship by which on-the-job experiences can be obtained. There are also universities that promote actions for the environment throughout the universities, and such progressive cases can be a model from which other universities can draw lessons for initiating their own actions.

However, the interview survey revealed that the field studies are not obligatory and left to the discretion of teaching staff members, and that the universities are not supporting participatory learning outside of the campus through the institutionalised arrangements of the universities and their departments. In addition, the interviews with corporate executives demonstrated that many companies have little experience of accepting students as interns, and that they are not prepared to respond to such requirements.

Column: ESD Activities at the University: Iwate University “Milky Way of Learning” Project

At Iwate University, based on the concept of “Milky Way of Learning”, it is intended to promote their unique activities the Modern GP for developing philosophy of Mr. Kenji Miyazawa, mutual collaboration with local communities, harmony between general and specialised studies, programme integration for developing citizens for the 21st century, visualisation of pragmatism. In particular, local disaster prevention / mitigation, environmental restoration and riparian collaboration are some of the main themes that the University take measures to address as a whole for educating students who possess integrated and interdisciplinary knowledge and its linkage with modern society, and to establish an ESD sub-major / minor by integrating general education and specialised education for supporting the development of human resources that will proactively involve in establishing a sustainable society.

2. Current status of environmental leader development in Asian universities

(1) Development of EE and ESD activities in universities

Overview of higher education

According to the World Bank survey (2004), the higher education enrolment rate in Asian countries is the following in descending order: Republic of Korea 89%, Japan 54%, Singapore 39%, Thailand 35%, Philippines 31%, Malaysia 28%, Brunei 15%, Indonesia 15%, Myanmar 12%, Vietnam 10%, Cambodia 3%, and Laos 3%. In addition, the rate of Australia, a developed country in the Pacific, is 72%, and the one for New Zealand is 86%.

Activities of each school / department

In the universities of Northeast and Southeast Asia, environment-related elements were introduced into the natural science field as specialised education in the 1970s, and the number of environment-related courses and divisions increased through the 1980s. However, in South Asia, environment-related elements were introduced by specialised education of the natural science field in the 1990s.

Reinforcement of EE in various school / department

In the 1990s, environmental factors were introduced in the fields of humanities and social sciences, and thereafter the environment is integrated into the programmes for training prospective teachers at the graduate school level.

In recent years, departments and courses focused on the environment were established in major universities. In particular, the department of teacher training, environment and sustainability were integrated substantively. The interdisciplinary graduate programmes that integrate social and natural sciences were established and launched in the late 1990s.

(2) Current Status of EE and ESD

Courses related to EE and ESD are taught mainly as specialised education courses at the universities in Asian countries that are advanced in development. Mainly in the specialised education focusing on the environment, the programmes on the environment and ESD are addressed in conjunction with humanities and natural sciences.

The focus of these courses varies according to regional characteristics. In Northeast Asia, the issues related to pollution control are more emphasised than natural resource management. On the other hand, in the South Pacific region, natural resource management is more emphasised than pollution control. In South and Southeast Asia, both pollution control and natural resource management are emphasised. In addition, in Northeast Asia, higher education institutes and government agencies provide international programmes while in South and Southeast Asia and the South Pacific, international development agencies and international NGOs are playing a role in providing such learning opportunities.

There are similarities throughout Asia in spite of development stages. One is that sustainability studies in general education at universities have been introduced although such cases are still scarce. The other is that EE and ESD have become prevalent at the universities with the master's and doctoral degree programmes, particularly those addressing sustainability as a speciality.

(3) Current status of pedagogy for EE and ESD

In Asian universities, knowledge transfer based education methods are generally used in conventional lectures and seminars. On the other hand, there are few universities that provide students with study through experiences and internship programmes.

In connection with the solutions of issues in local community development, community based and social service based teaching and learning methods are increasingly applied by university education in Asia.

Moreover, it can be seen that there is co-relation between the development level of higher education, methods of EE and their priority areas. In the countries where the higher education enrolment rate is comparatively low (15% or less), such as Fiji, Papua New Guinea, India, and China, EE tends to be incorporated into the curriculum centring on the natural science field as specialised education. Furthermore, EE in these countries has been developed through collaboration with international NPOs and aid agencies, and overseas training programmes in developed countries are also introduced

In contrast, the countries where the higher education enrolment rate is above 15%, EE is incorporated into the curriculum of both general and specialised education in the field of natural science, humanities and social science. In both general and specialised education, interdisciplinary and cross-cutting programmes are introduced, and ICT (information and communication technology) is substantively used for open universities and distance learning programmes. There are many cases that environmental centres (environmental education centres, centres for environmental information, etc.) are set up, and these centres function as a platform for providing students with information. Furthermore, it is remarkable that cooperative education with business and learning through experiences are emphasised in the area where the enrolment rate is high (above 50%).

3. Current status of environmental leader development in European and North American universities

(1) Development of EE / ESD activities in universities

Overview of higher education

The EE / ESD activities in universities in Europe and North America have been implemented since the 1970s, and many countries have been proactively undertaking such activities. For instance, in the United Kingdom, environmental research centres became hubs and provided master's programmes on the environment. It is remarkable that European and North American universities employ various teaching content and methods at different universities and departments. In addition, with advanced inter-university collaboration, it is easy to take courses provided by other universities.

Reinforcement of EE in various school / department

In Europe and North America, environment and sustainability related subjects were introduced in social and humanity sciences such as economics, political science and law at the early stage. For instance, in Sweden, the environment was designated as a core of the national policy after the United Nations Conference on the Human Environment in 1972, and legislation was enacted in 2006 to make it compulsory for all universities to address environmental issues as a way for mainstreaming environment and sustainability education.

Establishment of interdisciplinary environmental school / department

An increasing number of interdisciplinary master's degree programmes that integrate environmental factors have been established since the 1990s. For instance, the Master of Environmental Science, Policy and Management (MESPOM) is the one established by four universities in Europe (Central European University, Lund University, University of Manchester and University of the Aegean) with the support of Erasmus Mundus, a grant programme of the European Commission to support the cutting edge higher education. Erasmus Mundus is unique in that the enrolled students must attend classes at more than three universities, and each participating university provides thematic and cross-cutting environment and sustainability related courses. In addition, each university has environmental research institutes or centres that offer graduate level programmes and provide courses on cross-cutting subjects.

(2) Current Status of EE and ESD

At the universities in Europe and North America that were researched in the process of developing this Vision, numerous programmes and courses named after the environment and sustainability were established. Their contents are interdisciplinary, and environment and sustainability factors are incorporated. In addition, they are intended to integrate environment and sustainability perspectives in the conventional disciplines, and their efforts yielded positive outcomes. For instance, at the Göteborg University in Sweden, the course offering booklet, which indicates the extent of addressing sustainability in each course at the three levels namely 1)

substantive, 2) partial, and 3) none. Recently, even business schools are prioritising the courses on the environment and sustainability.

In the United States, environmental internships have increased in San Francisco Bay areas of California since the late 1970s. In addition, 1990 US Environmental Education Act was incorporated the provision on EE internship and fellowship. The provision is intended to promote opportunities for students and teaching staff in collaboration with specialised staff of the Federal agencies involved in EE to improve understanding and recognition of EE, and to acquire skills and capabilities required for such professions. Furthermore, interns and fellows are to work for the Federal agencies. Their work places include but are not limited to the Environment Protection Agency, Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Environment Council of the States, Federal Natural Resource Management Organisation, Department of Agriculture, and National Science Foundation. As described, in the U.S., a basis for developing environmental leaders has been established as nationwide public policies, and a framework has been being formed for students to learn ESD with experiences outside of university campuses.

Tasks assigned to interns vary from administrative work to resource management, education, and technology support. Similarly, interns' areas of speciality may range from sociology, biology, management, engineering, law, natural resource management, natural science, and architecture. There seems to be a co-relation between the types of internship work and the intern students' specialised areas in many cases. Students who major in biology and education, law tend to undertake management / control for internship work. Other co-relations that can be found are between natural resources and natural resource management, economics and public policies, and architecture and conservation.

(3) Current status of pedagogy for EE and ESD

At the universities in Europe and North America that were researched in the process of developing this Vision, the participatory pedagogies such as case studies, debates and role plays have been introduced in addition to the knowledge transfer type lectures. In some cases, the programmes that undergo experiences such as field studies are made obligatory, and importance is given to the type of learning to apply the knowledge learned in the lectures to real situations and to find solutions to problems. In addition, in particular at the graduate level, efforts are made to promote internship opportunities at the companies domestically or overseas, and to foster collaboration with government officials, corporate staff in charge of environmental issues, experts of NGOs and United Nations agencies for supporting programmes.

It must be noted that the aforementioned universities' collaboration with external partners can be achieved only when a systematic institution is established. For instance, in order to integrate internships into the formal programmes of the graduate schools, universities commit to contracts with the intern hosts (*e.g.* corporations), and place the institutional modalities in order for implementation at the universities (such as financial, personnel and systemic modalities).

In addition, in the area of promoting internship, coordinating agencies play an important role in mediating for environmental interns in the U.S. Coordinating agencies are entrusted tasks to introduce intern hosts,

convene seminars at universities, undertake preparatory training, implement programmes, and conduct *post facto* evaluation. Intern hosts widely call for intern applications and place right persons in the right positions in collaboration with coordinating agencies.

Column: Case of the Göteborg University and Chalmers University of Technology in Sweden

In Sweden, amendments of Higher Education Act in 2006 oblige the promotion of sustainability development, international cooperation and understanding, and the promotion of gender equality. Each university has promoted ESD in accordance with the amendments. The Göteborg University aims at incorporating sustainability perspectives into programmes and courses across university, and undertakes evaluation accordingly. A label marking system based on the evaluation has been introduced in its course syllabi since 2007. The university provides opportunities to learn about sustainable development for students not only in natural and social sciences but also in medical and education departments. The Chalmers University of Technology undertook a project promoting ESD during 2006 and 2009, following nine concrete policies. As an education method, it has promoted 1) to oblige basic courses related to sustainable development in all undergraduate programmes, 2) to increase master's programmes dealing with sustainable development, and 3) to introduce perceptions of sustainable development in other courses.

4. Towards Effectively Developing Environmental Leaders in Universities

As described in Chapter 1.4, it is vital for environmental leaders to strive to acquire skills and capability required as lifetime learning. This learning begins at a young age. Through outdoor activities, it is possible to acquire a respect for nature and a suitable mindset that contributes to environmental conservation will become a basis for all. In addition, specialised skills and leadership capability must be developed through career and civil society activities.

Universities are the place to acquire a wide range of general education and expertise. They orient the direction of students in terms of expertise and life after graduation, and produce human resources who play a vital role in socio-economic fields. In such a process, students are supposed to acquire strong motivation, expertise, and leadership in an integrated manner. Therefore, universities play a crucial role in developing environmental leaders.

Each university is expected to strive to undertake activities proactively with a view of developing environmental leaders, who promote the greening of economy and society, taking the respective objectives of developing human resources into account. In order to develop environmental leaders, it is a prerequisite to foster an environmental mindset, cultivate respect for nature, and contribute to environmental conservation prior to entering universities.

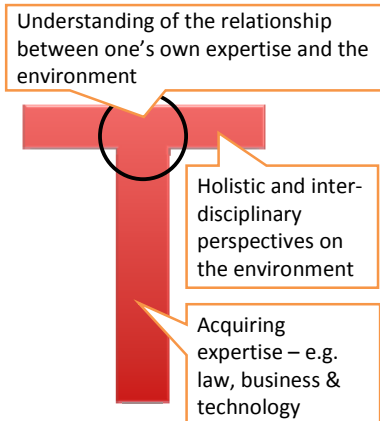
(1) Need to develop leaders with T-shaped and π -shaped capabilities

In order to develop skills and capabilities required for environmental leaders, it is deemed effective to develop T-shaped human resources namely to develop expertise in the vertical axis such as law and engineering, and at the same time to develop cross-cutting knowledge, broadened viewpoints and overarching capabilities, thereby integrating environmental perspectives into one's own expertise. In a similar consideration, there is a π -shaped capacity development that is to pursue two specialised areas (e.g. physical and social sciences) with cross-cutting knowledge.

In order to promote such environmental leader development, it is effective to encourage education to learn cross-cutting knowledge about environmental conservation and education to integrate such knowledge into own expertise. General education and sub-majors / minors are expected to demonstrate their usefulness in the context of promoting EE as cross-cutting disciplines and integration of environmental perspectives in specialised areas.

Component:

T-shaped knowledge system



- Components necessary in the Asian market
- Application of sub-major system

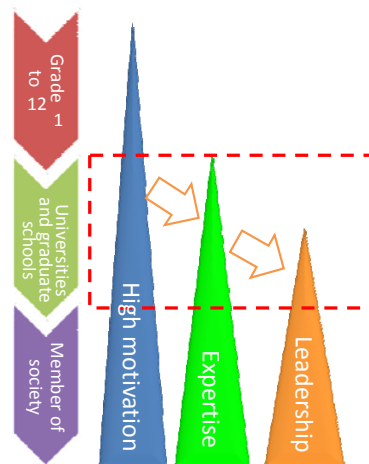
(2) Developing strong motivation and leadership capabilities for solving environmental problems

Environmental leaders must possess strong motivation for solving environmental problems and leadership capabilities such as planning, envisioning, negotiating and consensus building capabilities towards solving environmental problems. In addition, it is desired to develop social entrepreneurs who demonstrate leadership to plan and undertake on their own the operational activities towards establishing a sustainable society.

In some universities, the pedagogies that develop analytical skills and leadership capabilities based on the case materials for solving environmental problems, emphasising skills and capability development are introduced. Some universities have introduced fieldwork and internships. In order to disseminate such methods to a larger number of universities and to promote them effectively and efficiently, it is vital to adopt them as a part of the formal educational programme for credit acknowledgement, and to develop institutional support systems at the university and department levels.

At present, it is difficult to state that values of environmental conservation are given priority in the conflicts of interests in real social life while many people support environmental protection. In order to overcome such challenges, it is important to develop strong motivation and leadership capabilities for planning activities, integrating the environment, economy and society, convincing stakeholders and building consensus while listening to opposing viewpoints for solving environmental problems. In order to develop such capabilities, it is deemed as highly effective to provide collaborative work and proactive learning places among students such as debates, role plays and presentations, and fieldwork and training based on the real environmental problems, and pragmatic learning opportunities such as internship. From the perspectives of developing environmental leaders in Asia including Japan, it is essential to expand global perspectives, inter-cultural interaction, and sense of values through fieldwork at Asian universities and local areas. In addition, it is also important to participate in activities to apply and repeat what is learned through the involvement in student organisations, and undertake activities towards transforming a current society into a sustainable one.

Period:
One can learn the three prerequisites for environmental leaders



(3) Formulation of teaching and learning methods for developing environmental leaders

Pragmatic methods for teaching and learning in ESD areas other than lecturing are still at a developmental stage while attempts are made to promote proactive learning and to foster learning through participating in problem solving in a real society. In order to promote the formulation and dissemination of effective teaching and learning methods, it is vital to undertake training for teaching staff members, provide them with incentives, build institutional set-ups for promoting intra-university and external collaboration, and share

experiences.

In order to develop environmental leaders who will play a leading role in Asia, it is important to promote learning of fieldwork situations in Asian countries and activities in a timely manner with experiences. It is effective to promote the sharing of Asian knowledge and provide students with international experiences. However, such learning is constrained due to the budgetary limit. It is useful to explore the sharing of course contents among Asian universities using ITC. It is vital to explore the expansion of such ITC supported activities in the light that they will make it possible for students affiliated with a certain university to acquire knowledge from other universities in Japan and other Asian countries.

(4) Development of pragmatic materials for EE / ESD and educators

At this moment, while education has been provided knowledge concerning the theories and concepts for environmental conservation, there are few cases where students can learn based on the multi-angle analysis of lessons drawn from past pollution incidents, acquire knowledge and skills required for solving environmental problems at the field, and learn the reorganised theories based on the application of conventional theories and concepts.

Universities have great potential regarding the prediction of future changes in the industrial structure, technology and organisation, developing human resources suitable to such changes, and crating social evolution. In addition, it is important to develop materials and educators that objectively delineate the reality such as the inconsistency between the interpretation of environmental challenges based on cutting edge science, socio-economic structure and individuals' minds. They must convey past failures, reasons for the time-consuming process to solutions, imperfection of science, and the role of technology. In order to do so, it is important to develop and retain teaching materials and educators in collaboration with corporations, governments, NGO/NPOs that are involved in environmental issues.

Some concrete measures can be considered, for example, inviting people from corporations⁵, governments and NGOs as lecturers who are involved in solving environmental challenges at their fields to develop on-line learning systems such as e-learning, and to share classes among universities using Internet. It is effective to share existing human and physical resources in universities and external organisations. It is also useful to develop teaching materials that objectively analyse the history of past pollution and problem solutions, and to learn lessons for future with the participation of a wide range of stakeholders such as those of governments, corporations and NGO/NPOs. In addition, as universities have a pool of experts on EE and research, it is important to compile and disclose information, which teaching staff is undertaking what kind of education and research to make it possible to effectively and efficiently make a choice of teaching staff.

In order to develop environmental leaders who will play a leading role in Asia, it is expected to develop effective and efficient programmes through forming networks of Asian universities and utilising ITC such as

⁵ The term "corporation" used here and hereafter includes the primary sector of industry.

Internet, making use of Asian values (nature symbiosis, acceptance of diversity, mind of harmony, voluntarism for society, importance of ethics and sensitivity, and superiority of spiritual culture over materialistic culture), and sharing knowledge and experiences in environmental conservation among Asian countries.

(5) Developing environmental leaders playing a leading role in Asia

In order to increase the number of human resources for achieving a sustainable Asia and to strengthen their capacities, it is important to foster them in universities as environmental leaders of Asia to play a leading role in Asia.

So as to develop human resources required in the fields in Asia, it is desirable to develop human resources near the local livelihood and development fields in Asia. In addition, it is vital to develop the capacities of researchers in universities in order to foster personnel specialised in engineering such as monitoring so that technology can be developed and maintained. It is suggested to build systems to develop and dispatch environmental leaders by designating a key university in each country in Asia.

On the other hand, consideration must be given to the distinctive difference between the technologies and capabilities required for development fields in Asia and those required for developed countries when it comes to the development of environmental leaders who will play a leading role in Asia. For such reasons, it will be a task to develop educational systems suitable for students from Asia more specifically to formulate educational curriculum based on knowledge and experiences useful for Asian fields and reflective of situations of environmental policies in respective countries. At the same time, it is not possible to introduce the Japan made models in Asian countries without any adjustment. Regarding the development of human resources required for Asian fields, it is vital to develop curriculum in collaboration with the universities as close to the fields as possible, and to meticulously consider their effects.

5. Current Status of Accepting in Society of Environmental Leaders developed in Universities

It is indispensable to develop social systems where environmental leaders will make use of their skills and capabilities and play a leading role in economy and society after graduation. The following tendencies and expectations are found concerning the acceptance in the society of students who learned environment-related subjects in universities.

(1) Limited work place and recruitment of human resources majoring in the environment

Acceptance of human resources with expertise

There are high demands of corporations for human resources who possess specialised knowledge and skills in respective fields, and at the same time hold cross-cutting environment and sustainability knowledge as characterised by T-shaped or π -shaped human resources. In addition, graduates from physical engineering such as sanitary engineering obtain jobs where they can make use of their specialised knowledge on the environment such as think-tanks and environmental business companies. On the other hand, the graduates from the environment departments who studied the environment in a cross-cutting manner, they rarely obtain jobs that utilise their specialised knowledge on the environment. The companies that undertake environmental conservation as a core business recruit environmental leaders. However, they face difficulties in some cases in recruiting talented environmental leaders depending on the sector and the size of the companies.

Corporations give importance to the expertise such as social-networking, planning, envisioning and management capabilities. However, because the universities currently focus on knowledge acquisition, such capabilities are assessed based on the students involvement in students activities in many cases. For these reasons, corporations, except environmental business corporations, seldom take the environment-related background into account.

Practice of recruitment by corporations

Corporations assess graduates in a comprehensive manner by giving importance to the university's evaluation of students' achievements in acquiring knowledge and skills in specialised areas such as law, economic and engineering, and combining with the corporations' own tests and interviews. In other words, corporations give careful consideration to the specialisations that are closely linked to their businesses and sectors (*e.g.* construction companies give considerations to the subjects of architecture and civil engineering).

Corporations see an increasing need for environmental leaders. However, they primarily pursue the experienced and established experts and practitioners in environmental analysis and environmental assessment as a part of implementing environmental measures in corporate activities; therefore, new graduates seldom meet the requirements.

Practice of recruitment by governments and NGO/NPOs

It is a common practice in the process of government recruitment to assess by testing the level of knowledge required for administrators, and evaluate the level of socialising, planning, and envisioning capabilities that are basic requirements for administrators through interviews. Knowledge on the environment is not considered as an important skill except for the technical staff.

NGO/NPOs recruit few graduates, and tend to recruit the environmental experts who already have experiences and achievements in society. The recruitment is highly irregular. A limited number of NGO/NPOs can employ environmental leaders with a proper standard of salaries.

Current status of accepting environmental leaders in Asia

In Asia, the people who learn environmental management tend to pursue jobs in the public sector rather than corporations. It is a general trend that environmental leaders are accepted in society in the occupation categories prospective to become leaders in the future such as researchers, environmental engineers and local government officials. Such a tendency is distinctive in the countries that have a low rate of enrolment in higher education, and in such countries the human resources accepted in NGO/NPOs are considered as elite.

However, in some Asian countries, job openings for the people who complete the higher education are chronically limited while there is a growing demand for human resources who pursue economic development and build a sustainable society.

(2) Increasing need for environmental leaders for building a sustainable society

As the effects of global warming have become evident, it has been increasingly important to develop environmental leaders in corporations, governments and NGO/NPOs in order to build a sustainable society. In other words, it is projected that there will be expanded opportunities for environmental leaders to play a leading role as they have strong motivation for solving contemporary environmental problems, possess knowledge and skills in specialised areas on the environment and sustainability, and have envisioning, planning and management capabilities for promoting social transformation in the midst of enhanced efforts to take environmental measures in various sectors.

For instance, environmental and corporate social responsibility actions are not just the corporate image strategies and publicity, but the real fact that they cannot survive without squarely undertaking environmental and corporate social responsibility activities. In such corporate activities, the need for environmental leaders will grow more and more in the future.

For such reasons, in reality, many corporations provide EE for their own employees within the companies, and it has become necessary to pursue collaboration with the universities in order to support the development of environmental leaders in universities and to effectively develop environmental leaders within the companies.

6. Challenges to Inhering environmental leaders into Society

In order to develop environmental leaders who will play a role in developing a sustainable society, and to promote their acceptance into society, the following points need to be considered, and a wide range of measures must be launched.

(1) Clarifying the skills and capabilities of environmental leaders required by the recipient⁶ society and collaboration between developers and recipients

In Japan, it is important to give importance to developing not only the skills and capabilities required for researchers in universities, but also those required for environmental leaders at the side of corporations, NGO/NPOs and government in achieving a sustainable society as described in Chapter 1.3. For such a purpose, it is vital to match the development policies of universities as human resource developers and the needs of corporations, NGO/NPOs and governments as human resource users. It is therefore essential to clarify the skills and capabilities of environmental leaders required by corporations, NGO/NPOs and governments as human resource users.

In addition, from the perspectives of training educators and arranging fields required for developing skills and capabilities of environmental leaders, it is indispensable to promote collaboration between human resource users and universities, and to develop environmental leaders thereby meeting the needs of human resource recipients in society. In other words, it is important to establish a system, by which universities and human resource recipients collaborate more specifically for developing environmental leaders.

To do so, it is necessary to clarify the skills and capabilities of human resources that the society, which receives the trained human resources, demands, and to share information on methods undertaken by the universities for developing such skills and capabilities through the universities' curriculum as well as the programmes of universities that are intended to develop environmental leaders based on such methods.

In Asia, it is a required task to develop environmental leaders with a high level of specialised skills and capabilities who can instantly undertake substantive work in the sectors where many environmental leaders move in as elite groups who will prospectively assume leading positions. However, such required skills and capabilities depend on the stage of development of respective countries. Therefore, universities of respective countries must develop human resources required by the society in the light of socio-economic conditions of respective countries.

(2) Appropriate matching of environmental leaders

⁶ Recipients here indicate potential employees such as industry, NGO/NPO, and governments, who hire environmental leaders as interns or regular employees

In Japan, environmental leaders are demanded by not only the large corporations, but all the levels of sectors including small and median enterprises and NPOs. The students' job demands tend to be concentrated on good performance or large companies, and it is important to provide assistance to orient the students' job demand to others. It is vital to harness ethics required for achieving a sustainable society in addition to skills and capabilities. This can also be applied to environmental leader development in Asia.

In addition, it is important that the systems can be developed for human resource recipients to obtain information and that the universities developing human resources use such systems. It is also vital to provide assistance in order for environmental NGO/NPOs and research institutes to evolve into organisations with high level of expertise and credibility overcoming a fragile financial basis, to become capable of continuously employing talented human resources, and to play a role in accepting environmental leaders.

(3) Introducing systems for clarifying skills and capabilities of environmental leaders, and providing incentives

It is useful to substantiate the qualification and certification systems in order for recruiters to assess and judge the skills and capabilities of environmental leaders.

It is also effective to develop systems that can give a certain advantages to those who are recognised as environmental leaders to contribute to sustainable development. In Asian developing countries, people who undergo high quality of education tend to opt for overseas. Thus, it is vital to give environmental leaders some incentives such as a certain level of satisfaction in terms of salaries and employment conditions in their countries.

In addition, environmental leaders who have incentives, skills and capabilities to work for environmental conservation must be enabled to enhance their involvement in the related projects. It is therefore important to establish a system for pooling, attaining, and expediently making use of environmental leaders.

(4) Advancing actions for sustainable economic systems

Promoting the transformation of industrial structure and land use towards a low carbon and sustainable society will consequently expand opportunities for environmental leaders to play a leading role. Therefore, in order to establish such an economic and social system, it is desired that the systems supporting the greening of corporations and universities are established.

In pursuing sustainable local community development, a local community is a very place to establish a sustainable economic system. It is important, for instance, to build a system for linking universities and corporations keen to practise CSR activities in local communities, to develop environmental leaders, and to form collaboration specifically for producing human resources that promote ESD in local communities.

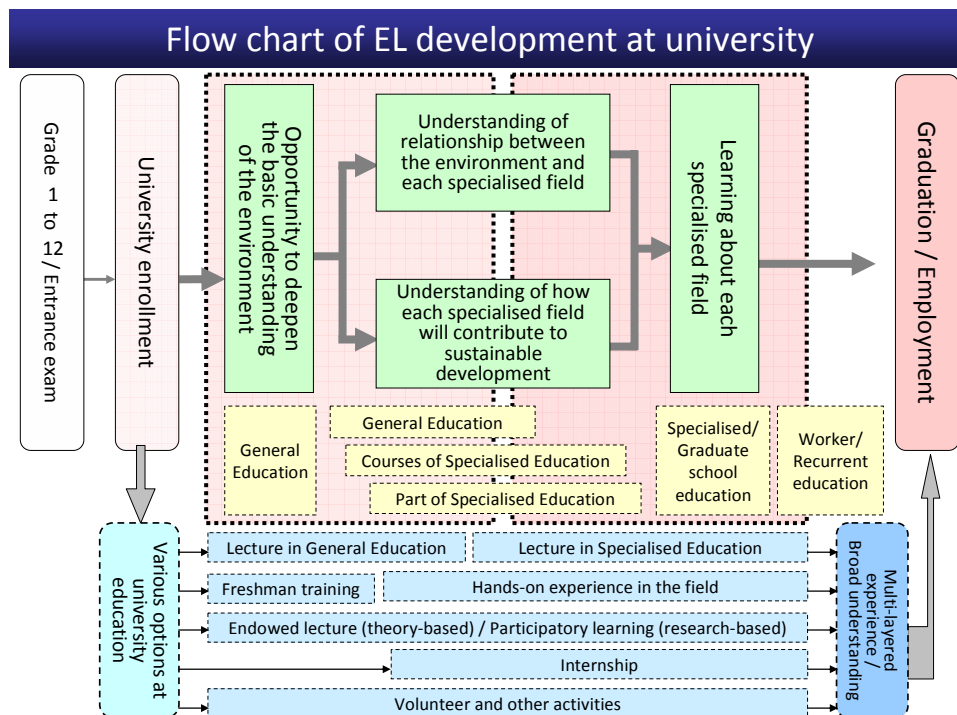
In addition, from the viewpoint of Asian sustainability, it is essential to support joint research for embodying environmental measures by Japanese corporations operating in Asia.

Chapter 3: The Promotion of ELIAS (Environmental Leadership Initiatives for Asian Sustainability) in Industry – University – Government – Civil Society Collaboration

1. Activities for Environmental Leader development in universities

Universities must play a leading role as a place to develop environmental leaders since the universities are supposed to develop student skills and capabilities required to play a role as experts in the future and to influence the direction of careers after graduation. In addition, as mentioned earlier, universities play a very crucial role in developing environmental leaders as the three prerequisites of environmental leaders namely *strong motivation, expertise* and *leadership* are to be developed in comprehensively during this period.

From the viewpoint of developing environmental leaders who will play a role in establishing a sustainable society, the activities that are expected to be undertaken by the universities include the introduction of lectures and seminars on the environment and sustainability as well as participatory activities, and the expansion of fieldwork for addressing environmental issues and environmental internships. In addition, it is important to promote EE and ESD in continued education and recurrent education.



(1) Introduction of programmes and curriculum for environmental leader development

Based on the discussions at the committee meetings, public comments, and opinions expressed by the participants from universities, corporations, NPOs and governments at the workshops on environmental leader development, the following aspects are expected to be included in the programmes and curriculum for

environmental leader development.

i. Teaching method for developing skills and capabilities of environmental leaders

As described in Chapter 1.4, from the viewpoint of obtaining skills and capabilities required for environmental leaders, the following perspectives are deemed as important in the programmes for environmental leader development.

Learning for “Enhancing motivation towards environmental conservation and establishing a sustainable society”

In order to foster strong motivation for environmental conservation and establishing a sustainable society, first it is necessary to experience the severe environmental problems and impacts on society and people through visiting the field aggravated by pollution and exchanging views with the patients who suffer from pollution impacts. For instance, one approach is to learn through field studies on a socio-economic vein such as waste treatment plants, or by experiencing forest management in the source of water that produce abundant water and diverse life.

From the viewpoint of enhancing individual motivation, it is useful to have interactive communication such as role plays by students or discussions with stakeholders at the field through field visits and studies.

In addition, as for the global environmental issues that appear not to cause any substantive impacts in the near future, it is vital to understand the mechanisms of such problems and projected impacts. For such a purpose, it is very important to undertake lectures and group work in order to acquire scientific knowledge on physics and chemistry required for understanding the mechanisms.

Learning for “interdisciplinary knowledge and skills for environmental conservation”

As for the acquisition of interdisciplinary knowledge and skills for environmental conservation, it is useful to acquire knowledge required for planning and envisioning measures aimed at environmental conservation based on respective expertise through lectures, experiments and seminars while it is effective to undertake experiential learning such as role plays, case studies using real case materials and debates in order to obtain skills for tackling environmental challenges that require perspectives of improving and integrating socio-economy and that cannot be solved easily. In such a process, high impacts can be expected in terms of developing overarching capabilities and over-viewing skills through collaborative learning among students with different majors and Asian / Japanese students with different social backgrounds.

Domestic and overseas field studies and training provide opportunities to acquire ‘hands-on’ knowledge and are important for the development of knowledge and abilities regarding interdisciplinary issues. For instance, in order to enhance expertise and develop overarching capabilities from cross-cutting environmental conservation viewpoints, it is useful, for instance, to undertake fieldwork on the total systems of nature and people such as research and analysis on natural environments and livelihoods in the riparian landscapes that are created by natural topography from upstream forest areas to downstream urban areas.

In addition, the introduction of on-campus environmental management systems, environmental monitoring / accounting, and sustainability reports with the participation of students improves facility use and promotes on-campus activities aimed at environmental improvement and sustainability through campus life. It will also provide the fields to obtain practical skills. It is possible to combine lectures, seminars and field studies for eco-campus establishment and management, and an eco-campus by itself will become an educational resource on the environment and sustainability.

Column: Eco-campus White Paper of Yokohama National University

The Yokohama National University has produced the “Yokohama National University Eco-campus White Paper” since the FY2006 in pursuance of the FY2003 Guideline for Environmental Reports released by the Ministry of Environment. The reduction targets were set for respective energies. Teaching staff and students practise measures for reducing energy use towards achieving the established targets. As a result, in FY2007, it achieved a reduction in energy use by 5%, pilot recycling of waste water, a reduction in use of photocopy paper by 2%, and a reduction in green house gases emissions by 8.4%. Yokohama National University is ranked at No.1 as a Japanese university in ISI university ranking that indicate the number of article quotation in the areas of ecology and the environment. It is considered that these activities help promoting research on the environment.

Learning for “Demonstrating leadership for social transformation”

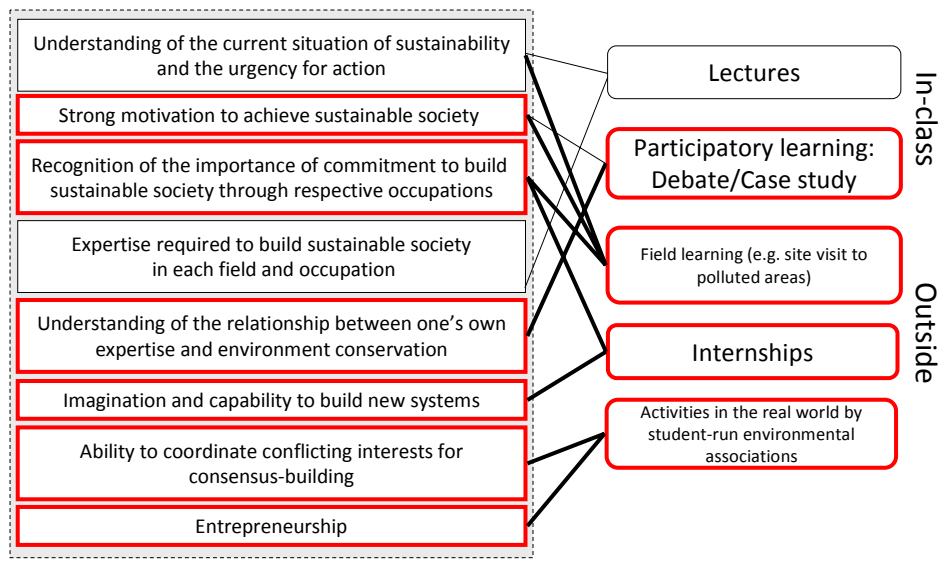
It is useful to develop communication, management and consensus-building skills through group work and debates among students, and fieldworks such as participating in developing goods and service and collaborating with stakeholders through solving problems in the field.

Issue solving internships and fieldwork bear meaning not only at the field primarily aimed at environmental conservation and environmentally friendly product development, but also at the field where environmental conservation is being inherited in various socio-economic activities.

In order to realise internship and fieldwork from the viewpoint of developing leadership capabilities for fostering social transformation, planning must be undertaken so that recipient corporations and local communities integrate them into their core business and environmental conservation work not as one of their volunteer activities but as their strategic business process while students are able to conduct their research and learn through such a process. For such a purpose, interns must acquire knowledge and skills required to deal with the pragmatic work at the field prior to commencing internship and fieldwork. Curriculum should be designed systematically, so that students are able to review education, knowledge and skills acquired through fieldwork at lectures and seminars after returning to the university.

In addition, to promote capabilities for envisioning, planning and executing activities towards establishing a sustainable society, involvement in social activities through student association, collaboration with governments and industries, and participation in international conferences are useful.

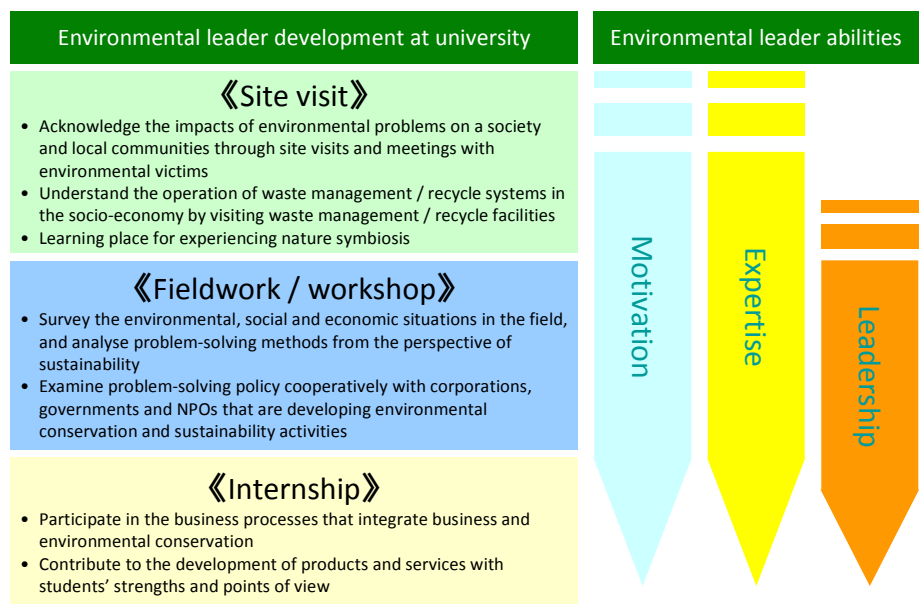
Methods/Places: Participatory, problem-solving & field application



ii. Programme elements for environmental leader development at undergraduate and graduate levels

Based on (i), the following are the contents of the programme desired to be provided at various levels of university education for developing environmental leaders.

Model of practical education for environmental leaders



Positioning at the general education – strong motivation towards environmental conservation and establishing a sustainable society

General education courses are important as they are to enhance knowledge from a wide perspective, to raise individual interests in social agenda, to enable each student to find areas of lifetime interest, and to clarify the specialised areas for their study. In these courses, it is particularly important to provide strong motivation towards environmental conservation and the establishment of a sustainable society. For such a purpose, it is useful to provide a curriculum of general education courses as compulsory or optional for all the departments to cultivate sensitivity and ethics for environmental conservation and to motivate students to take part in environmental conservation. At the same time, it is vital to provide learning space for promoting basic understanding on the mechanisms of environmental problems and environmental management. The environmental mechanisms and direct solutions require scientific approaches. Therefore, it is deemed as useful for social science students to acquire scientific knowledge required for understanding the mechanisms of environmental problems.

Examples of the curriculum designs are:

- (I) Lectures and seminars for promoting basic understanding on environmental problems (*e.g.* a mutual dependent relationship),
- (II) Fieldwork and visits to the field where environmental problems are evident or environmental management or environmental activities are undertaken, and
- (III) Based on (I) and (II), *post facto* education such as discussions and debates concerning solutions to environmental problems or formulating visions.

A combination of these elements is being considered. Through knowledge acquisition on these issues, fieldwork, and proactive learning, it is expected to cultivate environmental ethics and motivation for getting involved in environmental conservation and establishing a sustainable society. When implementing such curriculum, in addition to the regular teaching staff at university, it is useful to have external lecturers from corporations, governments and NGO/NPOs that are dealing with environmental issues at the forefront.

Column: CBI (Collaboration based Internship) at Kochi University

At the Kochi University, CBI (Collaboration-based Internship) is introduced as an optional course for the 1st year student to undertake a long-term pragmatic internship that can last up to six months at maximum, and gain 14 units of credit. Since FY2005, about 20 students undertake the course each year, and the host of interns accounts for 15 companies. Internships range from marketing by environmental venture companies, to launching new business activities with company managers with the assistance of internship coordinating agencies in Tokyo, Gifu and Osaka. Students can choose from a wide range of options based on their interests. The professor in charge of the course states “Internship helps foster students’ human capabilities and aspiration. They will sprout only between those who work seriously. Students have wider opportunities to develop their human capabilities and aspiration by transforming on-campus education to outside learning at external fields by utilising resources available outside of the campus. Although students obtain knowledge through their campus life, they do not know how to use it. I hope that they acquire experiences that change knowledge to wisdom through interaction with the society.”

Positioning in the specialised courses – to acquire expertise and obtain interdisciplinary knowledge, capabilities for environmental conservation, and leadership

The specialised courses are important for those who do not proceed to the graduate schools to acquire expertise and capabilities of specialised areas required for playing a leading role in the field of society, and to narrow down the direction after graduation. At these kinds of courses, providing learning opportunities to enhance their expertise in the selected subjects such as law, economics and engineering, interdisciplinary and integrating learning is necessary in order to incorporate the perspective of environmental conservation into each expertise.

For such a purpose, as a basis for learning the environment at the initial stage of the specialised areas, it is useful to provide opportunities to learn perspectives for environmental conservation in applying their respective expertise to society, to enhance the capability to find out challenges, and to acquire capabilities for planning activities and creativity. For instance, the scientific studies such as engineering are to raise the high level of expertise in a particular area. There can be opportunities at the same time to learn about technology and the environmental assessment by considering the impacts on the environment and society of introducing such areas in real society. In addition, as to the courses such as law and economics, it is useful to learn not only the short term welfare of human society but also the resource limitation and the long term externalities to the environment brought by economic activities when applying theories of law and economics learned from real society. To apply such learning methods, teaching staff must employ approaches of not only “teaching and providing”, but also “throwing questions” or “letting students find solutions” in order to raise student awareness on problems and motivation to pursue issues.

As for the teaching methods, to enhance expertise, debates on environmental problems and group work for envisioning solutions are useful. In addition, it is useful to experience the field of environmental problems for several months after such learning, by way of participation in the product and service development through internship, and problem-solving fieldwork in cooperation with NPOs and governments working in the field, to develop more pragmatic management capabilities.

It is important to place activities as teaching materials for environmental conservation in socio-economic activities by having some teaching staff members with different expertise teach a single course systematically or inviting external lecturers with experiences of social fields.

Positioning at the graduate level – to enhance expertise and play a leadership role in promoting social transformation “Environmental Leadership Programme Initiative”

From the viewpoint of developing environmental leaders who might become managers of corporation and policy planners of government in the future, it is expected to further enhance respective expertise through graduate school level studies, and to acquire skills useful in society through obtaining expertise from the perspectives of environmental conservation and sustainability. In addition, by further substantiating the understanding of environmental conservation and sustainability from overarching and integrating viewpoints,

it is expected to increase the T-shaped capabilities. At the same time, it is important to enhance “sociality” such as communication and consensus building skills required in the society, “entrepreneurship,” and “leadership” for taking innovative action.

For example, in the process of enhancing expertise at the graduate level, students need to obtain capabilities of acquiring a high level of expertise such as study on environmental laws as a major while taking practical policy with integrated and broad perspectives of environmental conservation and sustainability as a minor. In the latter case, it is useful to promote fieldwork and problem-solving type learning not only with the students of the same department, but with the students from different fields.

In addition, in order to achieve a low-carbon society towards greenhouse gas (GHG) emission reduction in the long term, social entrepreneurs are expected to play an important role in initiating innovative business activities towards a sustainable society. In this context, it is important to invent programmes for developing social entrepreneurs who will initiate innovative businesses, taking a long-term view. A student not only from a management department but also from other study fields can be a social entrepreneur. It is useful to develop a pragmatic curriculum, through which all the types of students can acquire entrepreneurship, capabilities for planning business, and management skills as a minor subject. In developing and proving the curriculum, it is helpful to involve players who gain public interests and profits such as social entrepreneurs, NGO/NPOs and corporations that have already succeeded in the field.

With the points discussed above, in introducing curriculum for environmental leader development at the graduate level, it is useful to develop strong motivation, skills, and capabilities to work for corporations, NGO/NPOs and governments by combining the curriculum for cultivating expertise in respective study areas and for developing comprehensive capabilities and social entrepreneurship.

For instance, students majoring in economics and business administration need

- the skills to run business that invests in sustainability,

students majoring in law, economics and education need

- the skills to build a framework for a sustainable society with a sense of balance as administrator,

students majoring in education need

- the skills to include sustainability in the curriculum of education,

and students majoring in engineering, physical science and agriculture need

- the skills to enhance technology that devoted to sustainability.

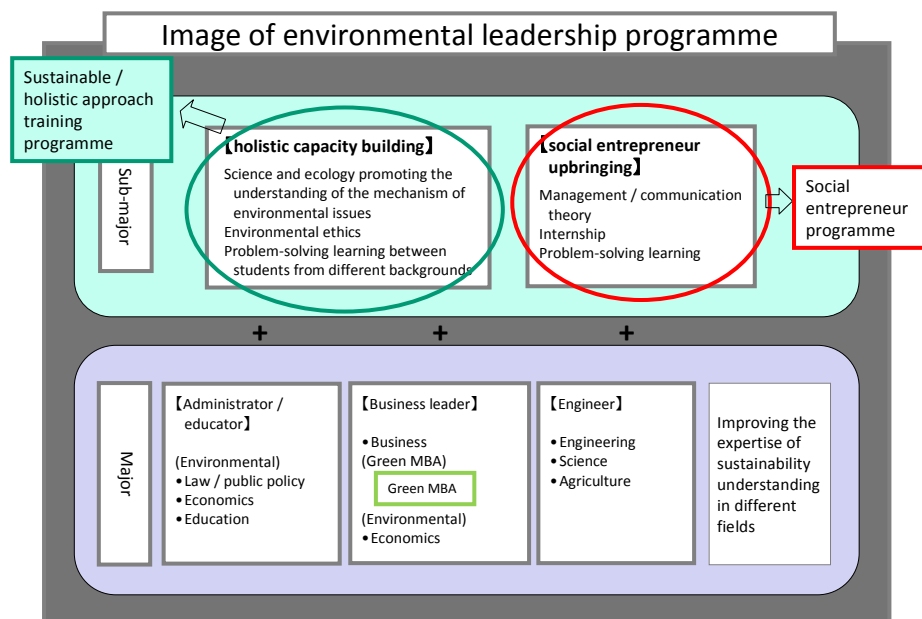
Furthermore, the establishment of an environmental leadership development programme that allows students to choose curriculum, which enhances a sense of sustainability or develops social entrepreneurship, is taken into account.

Europe, North America and Australia have developed Green MBA that integrates environmental conservation and sustainability into MBA courses (graduate schools for masters of business administration).

The Japanese Ministry of the Environment has been promoting the measures for environmental management such as ISO 14000 / 14001 and Eco-Action 21, the formulation of corporate environmental reports and guideline for environmental accounting, and environmental investment. For instance, it is

beneficial to develop the pragmatic green MBA curriculum, which are intended to develop an ability to initiate environmental business based upon the Asian characteristics including a method combining the environment and economy. Such a curriculum should be developed cooperatively with corporations so that students can obtain skills required to undertake business activities in addressing sustainability.

On the other hand, experts with a wide range of expertise are required to devise such a systematic programme, and it is difficult for a single university to offer such a programme. In such a case, an approach can be taken by universities with different strengths taking charge of a part of the curriculum. By sharing and integrating resources among different universities, it is possible to develop systematic and common programmes for developing environmental leaders.



Column: Green MBA: Integrating sustainability education into MBA in Australia

The World Resource Institute (WRI) has conducted research and verification of innovative MBA programmes that address environmental challenges every two years since 1998. With this initiative, the green MBA, courses aiming at acquiring and reinforcing pragmatic knowledge for developing a sense of social and environmental responsibility and business performance have increased across business schools in the U.S. and the world.

In such a context, the Australian Department of the Environment, Water, Heritage and the Arts, and major business schools have contemplated to integrate Education *about* and *for* Sustainability into MBA (masters of business administration) since 2004 in order to accelerate the greening of business through human resource development.

The department commissioned a work to the Australian Research Institute on Education for Sustainability (ARIES) of Macquarie University. It conducted situation assessment and research on good practices concerning sustainability education in MBA in Australia and the world. Based on this research, seven major Australian business schools (*e.g.* Australian Graduate School for Management: AGSM) and manufacturing, tourist, communication and banking industries have cooperatively integrated sustainability into MBA curriculum. They have also conducted survey research and developed partnership between corporations and

business schools to strengthen the development of environmental leaders who are able to play a leadership role in advancing business for environmental conservation.

Column: “Impacts of Technology on Society” in North America

At the Faculty of Engineering of Victoria University in Canada, a course entitled “Impact of Technology on Society” is offered. Discussions focus on the impacts of modern technology on the society from various perspectives of economics, the environment, politics and society. In other universities in the U.S., this course is made compulsory for freshman and sophomore. Student discussion is encouraged to promote proactive learning. One of the characteristics of this discussion is that emphasis is given to the process where instructors do not provide answers, and students draw answers by themselves.

Components of EL programme developed at by-target group workshop

	Capacity needed in policy making			Capacity needed in business administration			Capacity needed in civil society (NGO/NPO)	Summary
	Federal government	Municipal government	Resource-dependent business	Material production	Services / media	Finance		
Abilities needed in the field	<ul style="list-style-type: none"> To incorporate other stakeholders' opinions To examine stakeholder interests To collect, analyse information To envision a future vision To negotiate with stakeholders 	<ul style="list-style-type: none"> Tolerance To pursue a goal related knowledge and broad perspectives Understanding of relationship among nature, society and economy Calm judgment and ethical thinking 	<ul style="list-style-type: none"> Communication and marketing ability to link communities, villages, and generations Knowledge and ethics Entrepreneur mind Management skills 	<ul style="list-style-type: none"> Understanding of nature Environmental ethics Holistic perspectives to understand each expertise and nature Balancing sense (business and the environment) Practical skills Motivation for innovation 	<ul style="list-style-type: none"> Environmental communication Broad perspectives and questioning ability Imagination 	<ul style="list-style-type: none"> Basic knowledge of finance Environmental consciousness Ability to recognise environmental and other issues Capacity to understand overall idea Respect for living things Balancing sense (quality, quantity / long-term, short-term) 	<ul style="list-style-type: none"> Balancing sense (issues in the field and the needs) Presentation skills Capacity to make things real 	<p>Motivation: Environmental ethics / consciousness</p> <p>Expertise: Specialised knowledge / the relationships with the environment</p> <p>Leadership: Problem-solving ability, integrated understanding, communication skills</p>
Methods of EL development	<ul style="list-style-type: none"> Case study (theme, role playing, discussion) Experiential learning (a site visit, symposium) Action on campus (ISO promotion, plastic bag reduction) Motivation Graduate school for adult Fieldwork Certificate systems to validate skills and knowledge Education for Japanese thinking and technology 			<ul style="list-style-type: none"> Creation and share of systematic learning materials for EE EE in General Education (bottom-up approach) Field experience Corporation problem-solving project Effective curriculum 			<ul style="list-style-type: none"> Experience in the field Planning skills and immediate capacity development 	<p>Field sense: Case study / fieldwork / project-based learning</p> <p>Others: General- and theme wise- Education, capacity evaluation</p>

Note: EL Development Workshop ①(Carried out in Feb. 6 & 12, 2008 by Ministry of Environment) Discussion about the components of EL programme by-target group among representatives of corporations, governments, NGO/NPO and academia, and practitioners

Components of EL programme developed at by-academic workshop

	Engineering	Agriculture	Education	Law/ Economy/ Business Administration	General Education
Abilities needed in different academic subjects	<ul style="list-style-type: none"> Holistic perspectives to relate the technology, material, and system expertise to the society Social mind to understand the impacts on the environment and society Management ability to take initiative with skills acquired 	<ul style="list-style-type: none"> Understanding of agriculture and forestry in the field Business perspectives to innovate agriculture systems and transporting system Strong motivation and spirit to maintain agriculture activities under difficult situations 	<ul style="list-style-type: none"> Capacity to involve children, parents and communities in learning activities Effort to foster the abilities of each child 	<ul style="list-style-type: none"> Environmental mind Strong motivation to integrate an environmental perspective into business tackling oppositions within a company 	<ul style="list-style-type: none"> Interdisciplinary perspectives to see how each academic subject will contribute to sustainable development Understanding of diversity of sustainable development
Methods of EL development	<ul style="list-style-type: none"> Education on ethics of technology Social evaluation on technique Parallel education on the technology development and operation 	<ul style="list-style-type: none"> Fieldwork experience to communicate with stakeholders in agriculture and forestry (AF) programme offering business perspectives to cultivate AF industry with comprehensive systems from production to marketing and consumption programme promoting organic farming Internship at farms 	<ul style="list-style-type: none"> System formation that provides places to learn the environment in a society Experiential learning Education for teachers 	<ul style="list-style-type: none"> Fieldwork to attend an environment-related court case and a site visit to environmental business to like the relation between environmental problems and social/economic activities Sub-major in Environmental Study Internship included in a programme 	<ul style="list-style-type: none"> Promotion of EE at every academic field linked with a university principle Employing post doctoral students as researchers Tutoring system between students Long-term internship and evaluation of internship

Note: EL Development Workshop ①(Carried out in Feb. 18, 20 & 26, 2008 by Ministry of Environment) Discussion about effective methods for by-academic EL development through five workshops (engineering, agriculture, education, law / economy / business administration, and general education)

(2) environmental leader development programme in continued and recurrent education

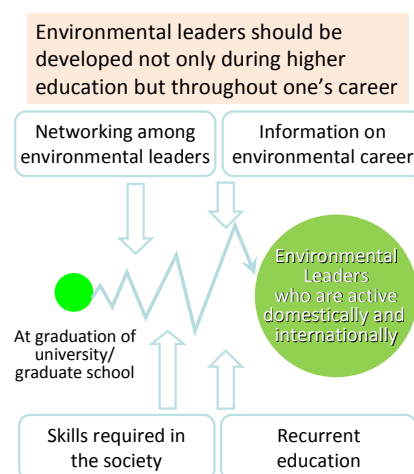
It is unrealistic to expect students in the 18 – early 20s age range to acquire comprehensive skills and capabilities required for environmental leaders who will play a leading role in society. In addition, the skills and capabilities specifically required for environmental leaders change depending on the places to work or their positions over the time. Therefore, it is very useful to promote continued and recurrent education at universities in order to advance the work after commencing certain work in society from a sustainability view, and to carry out new tasks for establishing a sustainable society.

Continued / recurrent education programme

For continued / recurrent education aiming at developing environmental leaders, it is necessary to open university education to local communities, to expand educational opportunities through substantiating continued / recurrent education, and to develop and provide opportunities for working students to learn intensively during the short period of time. In particular, it is important to plan and develop programmes for working adults to acquire pragmatic expertise required in the work places, and to receive certificates. Universities need to provide the opportunities for systematic learning (action learning) where “solutions to problems at the work place” and “education” can be simultaneously offered. In addition, in order to foster the rapid establishment of a sustainable society,

providing presidents and managers of the companies with learning opportunities as environmental leaders is another option. Furthermore, it is very important to provide re-learning programmes at a graduate level for those who are retired, but possess the background of certain knowledge and skills to play a leading role in different places as environmental leaders. This approach would better utilise senior human resources.

Lifelong capability development



Column: Collaboration between university and NGO: Case of International Aid Project in Shikoku

Universities in prefectures in Shikoku region of Japan, the Japan International Corporation Agency (JICA) and local NGOs have collaboratively launched the Shikoku International Aid Project since April 2005. Students can learn how a sustainable society can be established at local and global levels. The project is to develop human resources who can take action with diverse perspectives. The universities set a course entitled “international aid,” which is facilitated and operated by NGOs. The course is conducted through participatory methods such as workshops and group discussions. It is tailored for the students to experience international aid activities in Shikoku, and activities by ODA and international organisations. JICA Shikoku office concludes letters of agreement with respective universities, and provides Shikoku NGO Network with funding to conduct the course.

2. Building systems for universities, corporations, NGO/NPOs and governments to collaborate for environmental leader development

In order to realise the pragmatic programmes for environmental leader development as described in Chapter 3.1, it is essential to promote collaboration between universities, and between university, corporations, governments and NGO/NPOs.

In other words, in order to provide learning opportunities such as field work and internships, it is necessary to develop programmes in collaboration with corporations, governments and NGO/NPOs that have fields to establish a sustainable society. A platform consisting of business, government, university and civil society for collaboration to develop environmental leaders are useful as it is essential to facilitate collaboration between universities and recipients in society, to foster information sharing to develop environmental leader programmes. In this vision, a platform for business-government-university-civil society to develop environmental leaders is called a consortium, and its objectives, functions, and activities are proposed as follows.

(1) Objectives of the consortium for environmental leader development

The first objective of the quadripartite consortium (business-government-university-civil society) is to develop environmental leaders through promoting and supporting the introduction of high quality programmes in universities which will play a leading role in building a sustainable society. In other words, in order to undertake pragmatic education effectively and efficiently, it supports the matching between human resource developers (e.g. university) and the fields (e.g. industry) in the society. In addition, through such education, it aims at promoting employment for environmental leaders in a way that their expertise will be made use of.

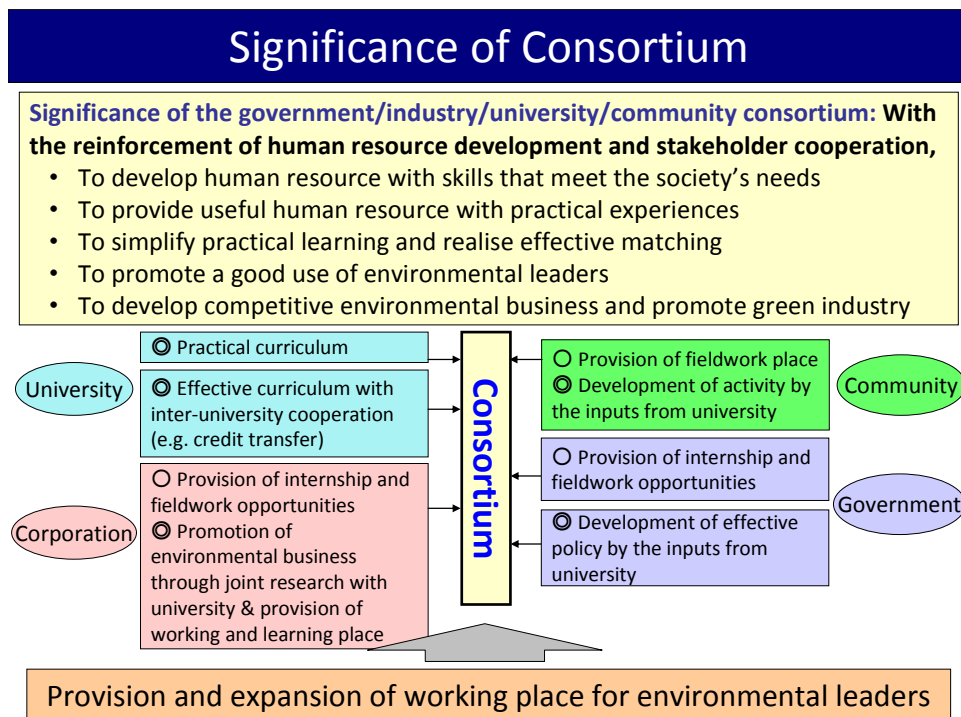
Specifically, the consortium is intended to coordinate corporations, civil society and governments to offer fieldwork and internship opportunities, which provide knowledge and wisdom through the experiences in the field and external lecturers. Through the consortium, joint research, environmental business and environmentally sound business activities can be promoted in collaboration with corporations while society and government can benefit from universities' expertise and inputs by hosting fieldwork. In addition, coordinator certificates for people who meet a certain level of qualifications and skills can be considered.

Other than these programmes, the consortium will be useful when it has window functions that connect with other Asian countries to develop environmental leaders for Asia. In other words, its function will be to coordinate Asian universities and Japanese universities, and to support the arrangements for Asian students to study in Japan.

In addition, in order to support the careers of environmental leaders, a function to promote business-university collaboration such as a study group that encourages joint research between universities and corporations, helping corporate environmental activities will be required.

The establishment and management of such a consortium aims at producing a basis for expanding

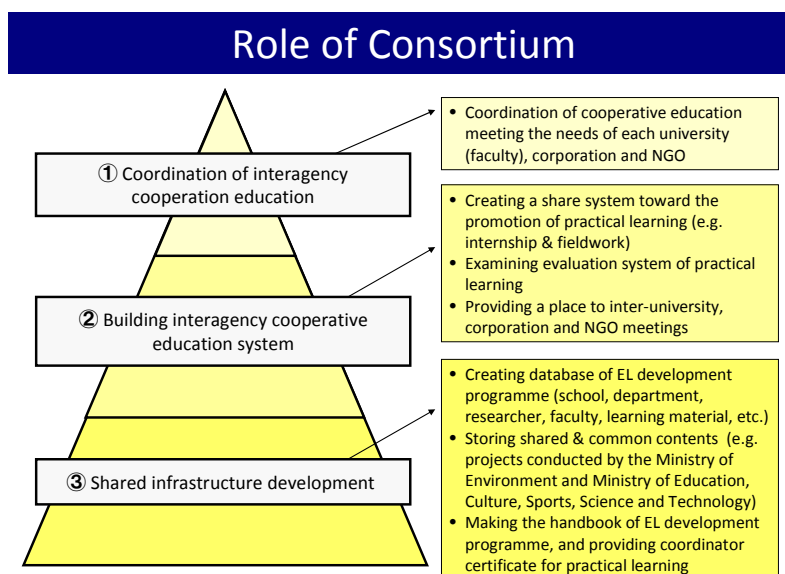
environmental leader development activities that are independent in economic terms and with respect to knowledge along with the axis of educational programmes for fostering win-win forms between universities, corporations, NGO/NPOs and governments.



(2) The role of the consortium for environmental leader development

Coordination of business-government-university-civil society collaborative education

One of the roles for the consortium is to coordinate the respective needs of universities, corporations and NGO/NPOs. In this respect, several functions can be envisioned such as utilising and introducing external lecturers to universities, promoting field work or field training using the fields possessed by the organisations concerned, building and substantiating environmental internship systems suitable for



the needs of the organisations concerned, supporting the formulation of curriculum and teaching materials for

environmental leader development building upon the particular resources and knowledge of the organisations concerned, and supporting the implementation of preparatory education for the students who plan to participate in internships.

In fact, in the case of undertaking operations, it is expected that coordinators will be deployed at the consortium secretariat who will mediate the fields to accept interns and universities, and to support the planning of projects as well as follow-ups to the hosts of intern students. In addition, in relation with students, it is expected to promote understanding on the significance of participating in business-government-university-civil society collaborative education, to provide motivation and direction and to provide support at the intermediary stage. For universities, it will provide students with support for pre and post education, and assist evaluation.

Establishment of business-government-university-civil society collaborative education systems

In order to coordinate quadripartite education through the consortium, it is useful to establish a quadripartite educational system. For instance, a consortium provides a forum where universities, corporations and NGO/NPOs can communicate, and builds common systems to promote pragmatic education such as internship or fieldwork. It is also preferable to examine evaluation mechanism in experiential education. It will be especially useful to convene seminars and gatherings for undertaking pragmatic education, to organise study group meetings, and to develop common systems that several universities can use such as the CSO (Civil Society Organisation) Learning System spearheaded by the Sompo Japan, a Japanese insurance company.

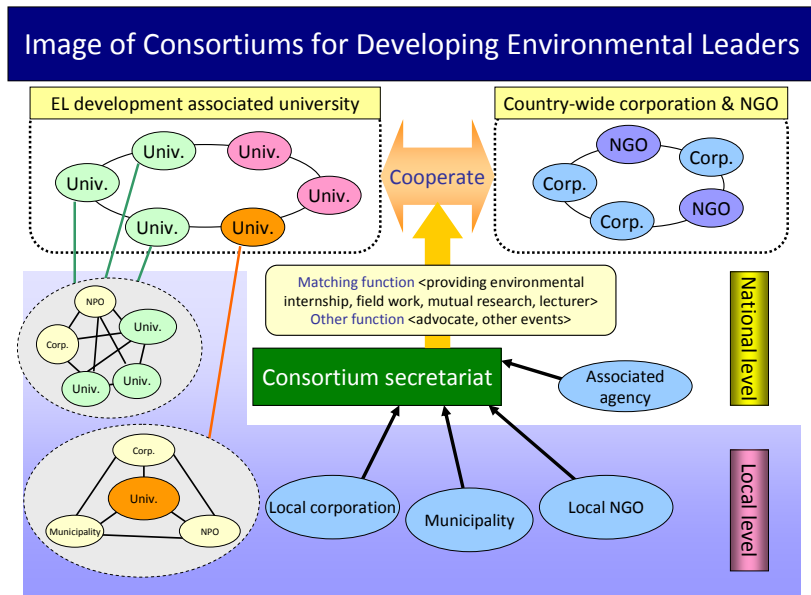
In addition, the outcome of experiential education cannot be evaluated from the aspect of knowledge, and is difficult to be judged by tests. In light of promoting social recognition of such education, a new evaluation method is necessary to assess whether the capabilities required by the society are developed. Study group meetings to examine evaluation methods need to be organised. Furthermore, evaluating university programmes that integrate environmental and sustainability values is also useful. A voluntary self-assessment or external / third party evaluation should be made. A system to record the results of evaluation in university management is required. It is expected that such a process will raise the awareness of teaching staff and students.

Column: Support to Internship by Sompo Japan CSO Learning

A system aims at promoting internships for undergraduate and graduate students at the environmental sector of CSOs. It raises awareness about environmental issues and improves the state of civil society through internships. It is also intended to develop workers with wide perspectives. It is also expected that the interns become a supporting workforce for host CSOs. Interns receive a stipend of JPY900 per hour. The stipend is provided by the Earth Club's Social Contribution Fund based on donations by the employees of Sompo Japan. The employees of Sompo Japan support the development of environmental leaders who plays a leading role in the following generation.

Development of common infrastructure

In order to make the consortium effective, it is necessary to develop and improve the common infrastructure that all the partner universities can use. For instance, the functions of infrastructure would include the development of the database on the environmental leader development programmes, the accumulation of common / shared contents based on the



experiences and knowledge from the operation with government support, the formulation of practical programmes / handbooks, and the provision of certification to coordinators of experiential education.

More specifically, the consortium would develop a database of programmes, curriculum samples and teaching materials both from Japan and overseas, organise study group meetings on the development of teaching materials and workshops for sharing experiences on measures and activities, and develop common contents of systematic curriculum based upon the experiences of various universities.

In addition, it would be useful to formulate a practical handbook that outlines educational methods for supporting the environmental leader development in universities.

Furthermore, coordinators are important to link stakeholders within the universities or in the local communities, so that universities can continuously carry out practical education. In order to support the deployment of such coordinators, the consortium is expected to provide training and certificate based reward system.

Column: Need for developing teaching materials for environmental leader development
 “Environment” has a shorter history in academia compared to other disciplines, and there is no established structure as an academic discipline. Looking at the Japan’s history of pollution, under the backdrop where there was a social trend to give priority to short term merits to those other than the environment, it was the reality that individual actions could jeopardise their positions and interests. We need create learning materials based on the lessons learned from the past experiences on the complexity of environmental issues in the field.

(3) Perspectives on establishing a sustainable consortium

To establish a consortium for environmental leader development and manage it in a self-reliant manner, the following is the perspectives that deserve due attention.

i. Self-development strategy

Through exchanging services, systems should be established where all the participating organisations such as universities, corporations and NGO/NPOs will benefit. It is also vital to promote the development of infrastructure and systems to promote the sharing of information among stakeholders in order to augment the commitment of stakeholders of universities, corporations, NGO/NPOs and governments. Through these measures, it is important to develop a structure that will evolve in a sustainable manner in terms of finance and activities.

To do this, it is essential to establish a secretariat with the legal status and retain permanent staff with management skills, to provide support conducive to enabling NGO/NPOs to demonstrate their potential as partners, to establish procedures and institutional frameworks for appropriately adjusting the programme contents and implementation modalities, and to build a mechanism for consistently mobilising autonomous resources from governments or public sectors without inclining to a particular sector.

ii. Maximising the use of and collaboration with existing networks and accumulation

It is necessary to establish meaningful collaboration with existing network organisations and activities including IR3S and the university consortiums at the local level. In addition, it is essential to accumulate the practiced ESD cases, and to promote their interaction in order to plan and pursue effective performance.

iii. Window and coordination functions

A consortium needs to enforce collaboration among business-government-university-civil society as a window and coordinating agency for domestic and international contacts.

iv. Gradual development of activities and networks

The establishment of the organisation with the functions of the consortium proposed in this Vision cannot be achieved just in a day. It is desired that its activities will evolve step by step in response to the needs of participants. In addition, it is preferred that it will be developed based on the participation of the concerned Japanese organisations at the outset. However, it is expected that the Asian universities and international organisations will participate and develop collaboration with them in a few years time.

3. Towards Developing Environmental Leaders in Asia

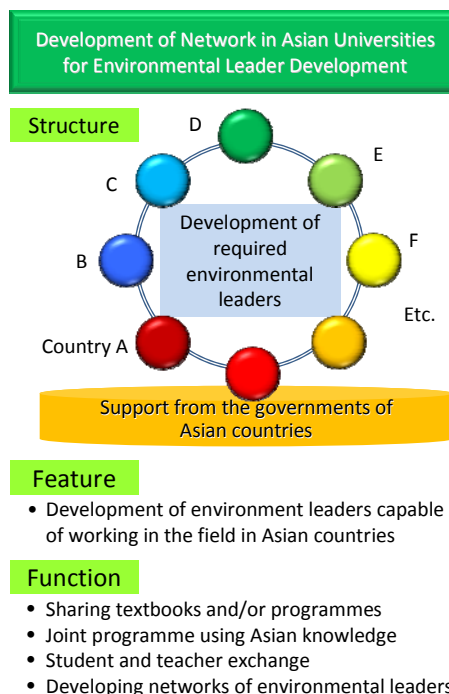
(1) Collaboration among Asian universities and establishment of networks

It is important to promote collaboration between Japan and Asia in order for Japanese students and Asian students coming from outside of Japan to study in universities in Japan, their home or other Asian countries and to play a leading role as environmental leaders in the future.

In order to make it possible, it is useful to develop environmental leader programmes discussed in Chapter 3.1, involving not only Japanese stakeholders but also participants from other Asian universities to share knowledge and fields of environmental problems in respective universities. In such a process, it is essential to share materials through e-learning systems, to rotate teaching staff and students among collaborating universities for a certain period, and to put the learning into practice.

In addition, it is useful to strengthen ongoing activities of respective universities, and to develop systems for inter-university collaboration as a part of support from official development assistance (ODA) and international organisations. It is particularly important to develop a scheme that Asian students can learn at the universities of their home countries through the collaborative activities, promoting the sharing of knowledge among Asian universities.

It is useful to develop networks among Asian universities and joint projects as a mechanism of promoting inter-university collaboration. Until now, there have been a number of initiatives in this context such as the Leadership for Environment and Development (LEAD)⁷, the Intensive Program on Sustainability (IPoS)⁸,



⁷ The Leadership for Environment and Development was established in 1991 with the support of the Rockefeller Foundation as an international network of experts who pursue sustainable development.

⁸ The Intensive Program on Sustainability (IPoS) is a summer workshop for discussing sustainability in Asia and the world and is organised by the University of Tokyo and the Asian Institute of Technology (AIT). Since 2004, programme activities and network development have been carried out with the teaching staff and students with different cultural and academic background in partnership among the University of Tokyo, AIT, AGS (Alliance for Global Sustainability) member universities and IR3S partner universities.

and ProSPER.Net steered by the United Nations University. It is expected to advance these initiatives to promote collaboration with the Japan's consortium as discussed in Chapter 3.2, and to foster the environmental leader development for a sustainable Asia through collaboration between Japanese and Asian universities.

In addition, while promoting multi-sector collaboration, it is useful to establish consortiums in Asia similar to those to be established in Japan to dispatch environmental leaders.

Column: United Nations University “Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net)” for establishing inter-university collaboration in Asia

It is an initiative to develop a network of environmental graduate schools in Asia promoted by the United Nations University Institute for Advanced Studies. The first meeting was convened in Yokohama in November 2007 with the participation of representatives from 11 universities in Asia and the Pacific. At the meeting, the participants shared information concerning ESD activities in universities, discussed concept papers and agreed upon the charter concerning the network.

Nine joint projects were proposed namely to promote the involvement of graduate school students in activities aimed at sustainable development, to train university / school teaching staff, to conduct training for government officials, to integrate sustainable development factors into business school curriculum and develop programmes, to conduct case studies on sustainable development, to undertake mapping of activities concerning sustainability by higher education institutions (research for taking stock of activities), to undertake activities for local people to get involved, to open summer schools for master's and doctoral students, and to promote collaboration of university teaching staff on sustainable development. At the research and organisational meeting held in March 2008, it was agreed to prioritise the implementation of joint project concerning the master's programme for public administrators and the business schools' programmes for environmental leader development.

In June 2008, it is proposed that the network will be officially established and that the various projects will commence.

(2) Providing incentives to develop environmental leaders for Asia

In order to facilitate the environmental leader development in Asia, it is indispensable to provide incentives for individuals to play a leading role as environmental leaders.

In addition, there are many cases where the students from developing Asian countries study in universities in developed countries and remain there to work. This can be meaningful in terms of pursuing individual satisfaction, but may result in capacity drainage of developing countries. In order to achieve a sustainable Asia, it is a prerequisite not only to develop Japanese environmental leaders who will act at the regional level in Asia, but also to augment Asian environmental leaders who will stay and develop networks in their home countries and make use of resources there. It is important to expand universities that can develop environmental leaders in home countries with methods described in (1), and to provide individuals with incentives such as giving social acknowledgement to those who play a leading role in home countries as environmental leaders.

In this context, direct incentives can be provided to those Asian students who aspire to play a leading role

as environmental leaders by establishing environmental graduate schools in Asia with the financial support of official development assistance (ODA) and international organisations, and providing places to undertake progressive and high level learning.

In addition, it will be required to establish systems for improving lifetime skills as environmental leaders and to raise the social significance of being environmental leaders through developing networks of Japanese and Asian environmental leaders and promoting their interactions.

(3) Use and application of this Vision to other regions

This Vision addresses the issues related to the development of human resources who will strive to pursue sustainable development in Asian and Pacific countries. However, it contains numerous considerations that can be applied to Africa, Latin America and small island countries and regions. As it has been becoming necessary to undertake adaptation measures to climate change, a need for environmental leader development has been increasing in Africa and other regions. It is therefore useful to use this Vision in the context of promoting the Japan's international cooperation and development assistance cooperation to Africa and others. It is expected to make use of this Vision at various forums including the Tokyo International Conference on African Development and the Asia-Africa Forum where inter-regional cooperation has been fostered to promote the sharing of Asian experiences with Africa.

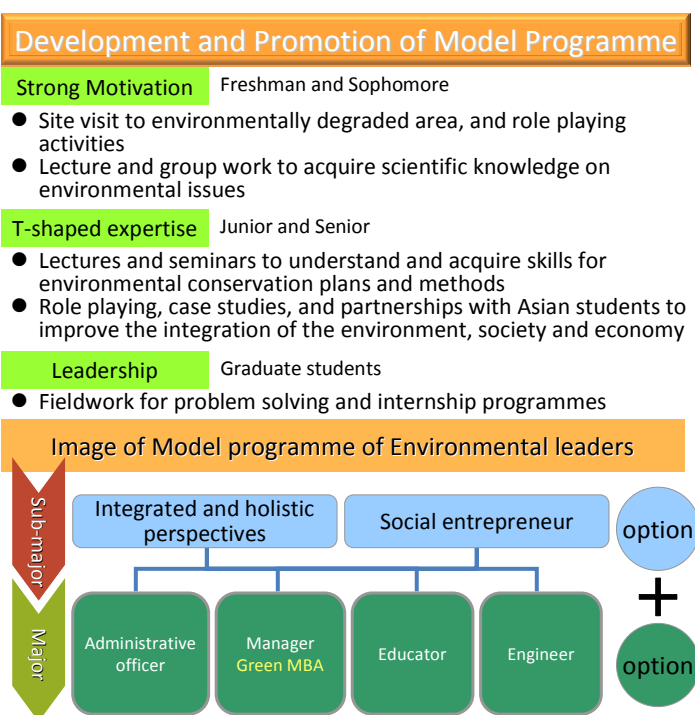
4. Proactive activities for promoting environmental leader development in universities

In addition to what is described above, the activities that can be undertaken by those other than universities are summarised below, with the viewpoint of promoting the development of human resources that will play a leading role in establishing a sustainable society in Asia.

(1) Activities by the government such as the Ministry of the Environment

i. Support to the development and verification of programmes for environmental leader development in universities

To expand the points about environmental leader development discussed in Chapter 3.1, it will be necessary to encourage the implementation of activities to develop and verify related programmes through collaboration between universities and employees such as corporations, NGO/NPOs and governments. In this context, it is preferable to support the systems where human resources will be effectively developed for establishing a sustainable society by promoting collaboration between Japanese and Asian universities, and making use of their respective resources.

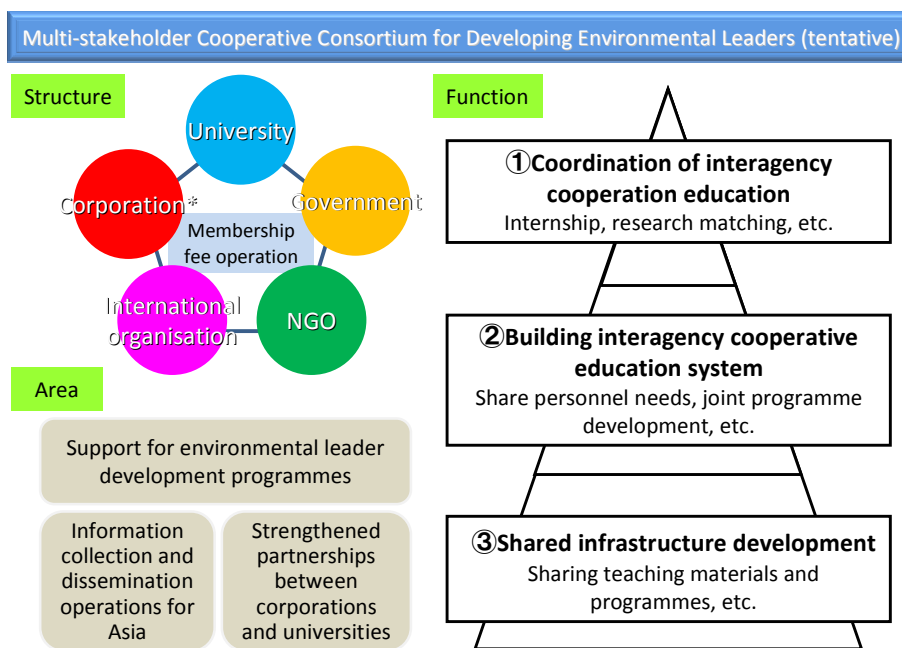


ii. Support to the launching of business-government-university-civil society consortium for environmental leader development

In order to realise collaboration between universities, or between universities, corporation, NGO/NPOs, governments and international organisations, it is important to launch a quadripartite consortium that aims environmental leader development as a primary objective. Assistance should be provided by the government during the first few years after its establishment and up to the time when the activities are substantively commenced. On the other hand, after the operation is placed right on the track, it is desirable that such activities will be continued and developed autonomously. For such a purpose, it is important to establish a membership system or membership fees in order to retain organisations that will continuously participate in

consortium activities and to constantly reserve financial resources.

In advancing consortium activities proposed in Chapter 3.2, it is appropriate to establish a basis of activities in integrity with the development and verification of the programmes for environmental leader development. In addition, after the basis of consortium is established, it will be useful to provide support to the establishment of collaborative relations with Asian universities and the development of networks.



*Note: Corporation includes the primary industry sector in addition to private corporations

iii. Consideration of other measures for environmental leader development

In promoting the development and use of environmental leaders, government would provide certificate like “Environmental Planner” that recruiting corporations can refer, for example. It also promotes publicity and award / recommendation systems on activities for developing environmental leaders in universities. It is desirable that such activities will be considered in light of the progress made in implementing activities described in (i) and (ii).

In addition, from the viewpoint of the recruiting side, in developing and verifying the environmental leader programmes in universities, it is preferable to demonstrate required skills and needs at the recruiting side and to provide knowledge and wisdom gained at the pragmatic fields, and to offer pragmatic learning opportunities required for developing human resources.

(2) Activities by corporations and NGO/NPOs

As for the corporations and NGO/NPOs involved in solving environmental problems, they need to indicate necessary skills and needs while participating in quadripartite consortium. They are also required to provide knowledge in the field as external lecturers and places to practical learning. Through such collaboration with universities, it is expected that further progress will be made by corporations pursuing sustainability in their business and by NGO/NPOs taking action for a sustainable society.

**2007 Vision for Environmental Leadership Initiatives for Asian Sustainability
in Higher Education**

**List of Committee Members
(Listed in Japanese alphabetical order / title omitted)**

Name	Title / Organisation (as of 2007)
Yurika Ayukawa	Climate Policy Senior Officer, WWF Japan
Kimio Uno	National Program Director, LEAD Japan
Shigenori Jinbo	Editor-in-Chief, Nikkei Ecology, Nikkei Business Publications, Inc.
Yoshiko Takeuchi	President, Ehime Global Network
Kazuya Tanada	Director for Climate Change Policies, Environmental Policy Division, Bureau of Environment
Tatsuo Tani	Associate Director, Division General Manager, Corporate Environment Division Executive Chief Engineer, Ricoh Company, Ltd.
Shinnosuke Tama	Trustee for Education and Student Affairs, Iwate University
Emiko Tsutsumi	Director, TAKEEI, Co., Ltd.
Naohiro Nakagawa	Secretariat, Watami Co., Ltd.
Masayo Hasegawa	Project General Manager, CSR Department CSR & Environmental Affairs Division
Hironori Hamanaka	Professor, Faculty of Environment and Information Studies, Keio University
□ Ryokichi Hirono	Professor Emeritus, Seikei University
Minoru Matano	Director, Deputy Chief Manager, Marketing & Sales (Civil Engineering), Taisei Corporation
Takashi Mino	Professor, Department of Socio-Cultural Environmental Studies Graduate School of Frontier Sciences, the University of Tokyo
Haruo Miyagi	Executive Director, ETIC
○ Itaru Yasui	Vice-Rector, United Nations University

- Chairperson
- Deputy Chairperson

**Minutes of Committee Meetings for the ‘Vision for Environmental Leadership
Initiatives for Asian Sustainability in Higher Education’**

23 July 2007

The First Meeting

- The purpose of the committee meeting
- Environmental leader initiatives in Asia
- Environmental leaders required for Asian sustainability
- The formation of the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’

27 August 2007

The Second Meeting

- The development of environmental leaders in universities
- The development of environmental leaders using a network between Asian universities
- Corporations’ environmental businesses with a long-term view
- The framework of the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’

20 September 2007

The Third Meeting

- The development of environmental leaders in cooperation with universities, corporations and NGOs / NPOs
- The compilation of discussions on the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’

22 November 2007

The Fourth Meeting

- Environmental leader development of Corporations and NGOs / NPOs in cooperation with universities
- Environmental leader development of university students through environmental activities
- Public comments on the discussion compilation and on-going surveys

23 January 2008

The Fifth Meeting

- Model of environmental leaders required for Asian sustainability
- The result of surveys
- The rough draft of the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’

28 February 2008

The Sixth Meeting

- The result of the workshops for environmental leader development
- The final draft of the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’

12 March 2008

The Seventh Meeting

- The final version of the ‘Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education’