BGCI's Indonesia Symposium on Plant Conservation Education

April 12 - 13, 2006

BGCI
Plants for the Planet

Status of Plant Education in Indonesia

- School curricula in Indonesia consist of two types in term of the material, i.e. monolithic (one subject) curricula, and integrated curricula.
- For monolithic curricula in formal education, plant education is usually covered in Biology-based subjects.
- The integrated curricula include material on plant diversity and conservation integrated into the relevant subject.
- Plant education in Indonesia is considered part of environment education (EE).
- EE are efforts conducted by stakeholders to change public behaviour and attitude. It aims to increase the knowledge, skill and awareness of the environment's value and environmental problems and issues. Therefore, people become actively involved in conservation activities for the sake of present and future generations.
- EE is conducted not only as formal education (schools and universities), but also as non-formal education (not a school and part of government institution) and informal education (not a school and not a government institution)
- EE as formal education is conducted in schools (primary schools, junior high schools, senior high schools) and universities, which are structurally and gradually adopting the methods and approaches of integrated or monolithic curriculum.
- The Botanical Garden of the Indonesian Institute of Science (LIPI) could campaign for the importance of plant conservation by collaborating with local governments and local NGOs, since schools already have their own curricula. Local governments and schools are free to make up their own curricula. BGs can collaborate with them to make their curricula monolithic.

A. Formal Education

- Plant education in primary schools is usually included under the subject "Nature Science". The subject containing plant education at Junior and Senior High Schools levels is Biology.
- In universities, the faculties that are Biology-based (such as Faculty of Biology, Faculty of Forestry, and Faculty of Agriculture) teach subjects regarding plants (including plant conservation).
- In Faculties of Biology, the intra curricula subjects with lectures, practical or lab works that include plant diversity and conservation are: Taxonomy, Structure and Development of Plants, Nomenclature, Plant Ecology, Ethnobotany, Plant Protection, Germplasm Conservation, Vegetation, Macroalgae, etc. As for extra curricula activities, there are many study clubs of EE (Bio flora, Scientific visits, field work orientation, research, etc.) as well as the EE course for Government Institutions out of the Ministry of National Education
- In the formal education system, EE began in 1977 as a monolithic curriculum.

- As a guide, the government Ministry of National Education (Depdiknas) has published competence standards and a map of the curriculum for schools (Primary Schools, Junior High School, and Senior High School). This curriculum includes EE.
- EE in schools and Universities can be either intra or extra curriculum. The intra curriculum EE can consist of several subjects or one subject (monolithic). The extra curriculum is done to develop the interest of the students in EE with many activities such as boy and girl scouts, conservation camping etc.)
- The local government sets the EE curriculum themselves for the local schools, where the curriculum is competence based. This curriculum is influenced by the characteristics of the local flora.
- Many Integrated modules of EE are available. The modules have been prepared by Universities (e.g. IPB –Agricultural Institute of Bogor), NGOs (e.g. KEHATI), Government Institutions (National Parks, Bappedalda), education network, etc.
- The Programmes of the Ministry of Environment related to EE (including plant education) for formal education are:
    - Developing curriculum of the science and technology of biodiversity for Primary, Junior High and Senior High Schools
    - Conducting Training Programmes for Teachers involved in the curriculum of science and technology of biodiversity
    - Programme for integrating science and technology of biodiversity into the national education system
    - Developing a communication and information system, whereby everyone can access all environment-related information for educational purposes

B. Non Formal and Informal Education

- EE (including plant education) for non Formal and Informal Sectors are included in 7 programmes of the Ministry of Environment, i.e. :
    - Developing the capacity of Local Government for conducting environmental public administration
    - Using of the capacity of human resources efficiently
    - Managing the resources of the institution
    - Managing the resource of non institutions
    - Conserving the natural environment
    - Developing the institutions
    - Developing the communication and information system
- The document regarding the biodiversity strategy and action plan (IBSAP) and the policy of EE of Indonesia are available references of EE in Indonesia

List of Stakeholders groups who are implementing T14 and brief examples of what they are doing

A. Ministry of National Education (Depdiknas)
The Policy in regards to EE:

1. To apply the curriculum principle with competence as a base.
2. Give authority to schools to develop their curriculum within the standards of the government (Ministry of National Education).
3. Guide the achievement of the standard for national education

B. Ministry of Environment
Policy and communication is based on the Indonesian Biodiversity Strategy and Action Plan/IBSAP

Programmes:

1. Implementation of environment impact studies
2. Development of the awareness of the people towards the environment
3. Development the awareness of the people so as to involve them in making decisions of public importance
4. Biodiversity conservation

The focus of the biodiversity programme is to produce a policy on species and genetic biodiversity, and biological safety.

The policy includes conservation, sustainable use and equitable use of biological diversity. The management of biodiversity conservation is carried out in various natural and man-made systems including agriculture and forestry. Conservation activities are done with the collaboration of relevant Institutions.

C. Schools
Plant education is implemented in schools as mentioned in part 2.1 (the status of plant education in

D. Universities

The subjects of the intra curriculum that include teaching, practical or lab work regarding plant diversity and conservation are: Taxonomy, Structure and Development of Plants, Nomenclature, Plant Ecology, Ethnobotany, Plant Protection, Germplasm Conservation, Vegetation, Macroalgae, etc. As for extra curriculum, there are many activities such as study clubs of EE (Bioflora, Scientific visits, field work orientation, research, etc.) as well as the EE course for Government Institutions out of the Ministry of National Education

As a part of the Faculty of Forestry at Universities, the subject of plant conservation focuses on lectures, field practice and laboratory work regarding plant conservation.

E. Botanical Gardens

One of the goals of the Center for Plant Conservation-Bogor Botanical Gardens (CPC-BBG) is to enhance environment education activities in the Indonesian Botanic Gardens. The programmes of conservation and environmental education at CPC-BBG include:

1. Tour of flora (plant collections) for kindergarten to high school students

2. Educational activities in collaboration with UNESCO
3. Learning to understand the global natural world
4. Environmental education route through the gardens
5. Workshop, exhibition, training for teachers, information/interpretive signs in the gardens
6. Books, posters, brochures, internet/website, video film and interpretation signs at the garden that explain the garden's plant collections

F. NGO's

Various EE activities have been carried out by NGOs in Indonesia.
The programme and activities of one national NGO, i.e. "Kehati" are:

1. The implementation is done with the ecosystem approach. Their programmatic implementation is through an integrated programme of IER (information, education, research), public policy advocacy, capacity building, conservation, and sustainable development.
2. Biodiversity and conservation education at Yogyakarta: issues of local food
3. Module of EE for teachers and students: Mangrove forest, Ridge of rock exposed at low tide
4. Press programme: television, magazine, newspaper, radio, local newspaper, etc.
5. Poster, exhibition, local art shows and games

G. **Industry and Banking Sector**

- The support of EE from Industry and Banking sector is usually by contributing funds for EE programmes and activities carried out by other institutions or organisations

Is T14 sufficiently covered within formal and informal education in Indonesia?

- T14 is sufficiently covered within formal and informal education in terms of policy, rules and regulations, standards, documents, materials, human resources, institutions (including NGO), etc.
- The problems are: the improper application of the education process, the low capacity of human resources, the limited distribution of all suitable materials, difficulties in achieving the pre-set education standards, and the lack of efficiency and effectiveness of all aspects of the education process.

Examples of good practice and whether it works well

A. Schools and Universities:

- One of the formal education programmes is to create a school with an environmental culture.

- The concepts/commitment of the ECO – SCHOOL in realizing this programme are:
  1. Integrate the EE material into teaching activities;
  2. Conduct training on the conservation of plants, animal, soil, water and air;
  3. Conduct campaigns about awareness of the environment among the students
  4. Conduct poster, writing and cleanliness competitions, etc.

- Non-wasteful natural resource utilization:
  1. Conserve plant diversity;
  2. Grow plants for conservation, soil water availability and the erosion prevention;
  3. Decrease paper consumption;
  4. Being thrifty in the use of water;
  5. Decrease run-off and increase water absorption into the soil.

- Reducing Energy Consumption
  1. Using less electricity
  2. Using electrical equipment that is energy efficient (using minimal energy).

- Awareness of pollution
  1. Prohibition of smoking at school;
  2. Growing more plants to reduce air pollution;
  3. Throwing garbage in the trash can or bin;
  4. Recycling garbage.

- Reducing use of chemical substances
  1. Using the least amount of chemical substances for environmental cleanliness;
  2. Using the least amount of chemical substances for laboratory work

- EE/Greening Curriculum
  1. Integrating EE material with the curriculum at school;
  2. Conducting training on the conservation of plants, animals, soil, water and air;
  3. Conducting EE awareness campaigns in primary, Junior high and Senior high school;
  4. Conducting poster, article, cleanliness competitions, etc.

- Recycling
  1. Separating organic from non organic waste/garbage
  2. Recycling garbage such as tin, plastic, paper and carton.

Manage, maintain and use the environment efficiently at schools and its surrounding area.
1. Creating school parks;
2. Creating botanical parks;
3. Displaying the Latin name of plants;
4. Installing irrigation systems for watering the plants;
5. Creating biological ponds;

6. Creating an Arboretum
7. Making temporary garbage bins

The target group of the eco-school concept are for school members and the public.

The steps taken by one eco-school

- Start with making the commitment → the location of school (SMA 24) is close to a river that floods the school, therefore the students and teachers have replanted a nearby bare hill to reduce the flooding.
- Continue with the action
- Write up and document the results
- Evaluate the results

Activities of a Senior High School (SMA 24) are: manage the environment of the school, campaign for increasing awareness of the environment, grow plants on the bare hills (to prevent flood and erosion, water saving, reduce the pollution and greenhouse effect and to conserve plant diversity), manage garbage, school park, facilities cleanliness, make the students aware of and love the environment.

They have been replanting about 800 plants on the bare hills. They have suggested more economic use of electricity, water and paper. The school staffs are asked not to smoke in the school's area. Throw the garbage away in the right place (separate organic and non organic garbage/waste). Create the School Park and Botanical Park. The arboretum could not be created, because of the limitation of school field. Cooperation with related government institutions has been done in conducting the eco-school concept. The school students have campaigned for environmental awareness to the students of Primary Schools.

Last year, SMA 24 conducted a convention meeting for students from Bandung city to make them aware of the environment. The students cleaned the river of garbage.

All activities were done successfully.

B. <u>NGO: Taman Sringganis, Pelestari Tanaman Obat</u>

The programmes of this NGO are:

1. Demonstration plot of medicinal plants
    1. Cultivation of seedlings of medicinal plants
    2. Medicinal plants ingredients, information on medicinal plants and product of medicinal herbs.
2. Visit
    1. Breath training, absorb the natural energy and plants
    2. Medicinal plants as drink and food.
    3. The way to diagnose the disease based on the nature equilibrium
    4. The human internal body clock, (biorhythm) as a guide for living with nature's equilibrium

3. Training Programme
    - The benefit and use of medicinal plants.

- Theory and practice in making various medicinal products.
- The food and drink as medicine, medicine as food and drink.
- Acupuncture Massage/ acupressure.
- Breath training and meditation.
- Self and nature potency (self confidence –self potential) for improving the health of HIV infected people
- Reflexology and Acupuncture Clinic

4. Herbal Village Tour specific to the Sundanese area and culture

C. NGO: Kehati

- Programme areas : *Java* (Jogyakarta, Madura, Jember, Malang) – *Kalimantan* (Kaltim –Nyuatan river and Derawan Island, KalTeng – Buntok, KalSel – Banjarmasin) – *Papua* (Bintuni, Serui), Sumatera (Bengkulu) - *Nusa Tenggara Timur* (Sumba) – Maluku (Kei).
- Approaches : ecosystem, programmatic through integrated programme of IER (information, education, research), public policy advocacy, capacity building, conservation and sustainable use

Programmes and activities:
Environment and diversity education at Yogyakarta city: tubers (the local food issue)
Teacher and student module: Mangrove forest and coral reef
Press/mass media Programme

- Communication-education Programme
- Serial talks at electronical press that are supported by companies, collaboration with television and public figures
- Article at printing press (such as TEMPO, a national newspaper)
- Facilitate and establish local "friends" by using the local press (for example: opinion debate in the local newspaper about local food issues (from land and ocean)

Development of alternative press/mass media

- Publication: learning book for "Friends" at the programme areas, serial book about environment (sponsored by CCFI)
- KEHATI Forum, KEHATI Award (local or tradisional activities pertaining to the environment)
- Posters, calenders, games, exhibitions, local arts, etc.

Conservation of medicinal plants in Madura island
Rehabilitation of River Stream Area Brantas at Malang city. Rehabilitation of mangrove at West and East Kalimantan.
Collaboration with EE friends (2001) to develop the modules for EE curriculim materials in all areas in Indonesia

The results from the programme and activities of KEHATI are the increased involvement of "stakeholders" (Universities, NGO, Local Government and Industries/Companies). The involvement of many parties are quite good to develop EE. The modules of successful learning model have been published.

Photos of the activities: from KEHATI (NGO)

Group discussion

Presentation of Group results

Coral reef and
beach abration

Nature is the education media and
the fisher is also a teacher

Discuss with the fisher

The Material of
mangrove ecosystem

D. WAC (World Agroforestry Centre, formerly called ICRAF: International Centre for Research on Agro-Forestry)

WAC conducts research at a National Park in Lampung, Sumatra that involves coffee farmers in the area. Some of the natural resources are threatened because of the coffee plantations in the area. The research programmes of WAC include coffee plantation and other natural research. The results have been published as a booklet etc. At NTB (nusa tenggara barat) province, WAC makes booklets and brochure for farmers as well as the accompanying programmes.

E. Local government

The local government conducts “greening activities” that involve many people, i.e. to conserve the rare plants in the critical field/land.

The gaps in implementing T14

A. Formal education

- Need networking and collaboration of EE (including plant education)
- The information are limited including books and references
- The materials of the curriculum are too many
- Need more awareness and good examples from the leaders.
- The available material is not interesting and not effective
- Lack of the capacity of human resource from the science (cognitive), skill (psychomotor) and attitude (affective)
- The funding from donors is limited
- The facilities are limited and its use is not effective and optimal
- The policy of the government about the National Academic Test (UAN)*
- School condition/environment is not conducive
- The attitude of all people at schools is one of not caring for the environment
- Management and success indicators of environment education at school are not clearly defined
- Curriculum at school are too many, the curriculum and extra curriculum are not yet integrated with the environment aspects
- The most learning method is by lecture. Teachers give lectures, but without discussion or practical
- Lack of the involvement of the school members to manage the environment education
- Biodiversity and Environment are not yet included formally in the school curriculum at some areas
- q. The concept of the important of plants for human living (materials, foods, medicines, cosmetics, ecological services, landscape) is already officially included in the schools curriculum, but is probably difficult to be understood by the teachers.

*The focus and awareness of the students are only on the subjects that are included in the End National Academic Test (UAN) such as mathematic, physic, Indonesian and English. This will reduce the awareness of the students to learn about biology including environment materials with plants as a basis.

B. Informal education:

- Lack of public awareness on their environments
- Lack of capacity and capability of human resources
- Not enough Funding
- Material, method and media of education: on a national level is too general, less flexible, with too few examples on local biodiversity and local environment
- Participation of all stakeholders in the curriculum design is not yet optimal
- Environment education process has not yet resulted in the public or people's awareness of environment problems locally. Education has not yet made people take the side of conservation and sustainable uses of natural resource
- There were 550 books about natural resources conservation and 20 modules eight years ago. How to make them accessible for public?

- Since Indonesian independence in 1945, education has never been the main focus of the country's development agenda. Government Budget for education is relatively low, with poor school facilities (even below standards).
- Sporadic environmental education. A clearing centre could play an important role in mapping of activities. What topic, in which level, which stakeholders, module and model needs to be mapped. Information on all activities should be documented and available publicly.

C. Non Formal education:

- Lack of awareness of T14
- Very little public awareness activities
- Not directly related to economic aspect of life, so most people are not concerned with it
- Not popular
- EE considered very ambitious and idealist
- The egos of each institution/organisation get in the way
- Lack of International involvement
- Temporary importance
- There is no clear sanction (government directive and legal framework)
- Cannot see direct effect, takes long time to see effect of EE
- Human resources and government are not professional
- The culture and tradition of the society
- Not supported by the government
- The lack of facilities
- The public does not know the advantage and the detriment
- People are afraid of being involved directly because they think the will be asked for funding
- Lack the awareness of the importance of the environment
- Misscomunication
- People feel that they do not have a stake in natural resources
- Lack of cooperation and coordination among related institutions
- Lack of institutions that coordinate and implement T14
- The decentralised government system makes each territory focus only on how to get income, leading to lack of support for the environment.
- Lack of people involvement and participation in EE because of lack of their understanding
- Lack of ability, skill and commitment of society (Industry, government) to solve the problem
- The assumption that EE is not important, the materials and methods are not applicable, lack of EE facilities and funding, lack of efficient, effective and beneficial programmes.
- Lack of coordination, not synergistic, sporadic.
- Lack of EE targets.

Recommendations for taking T14 forward

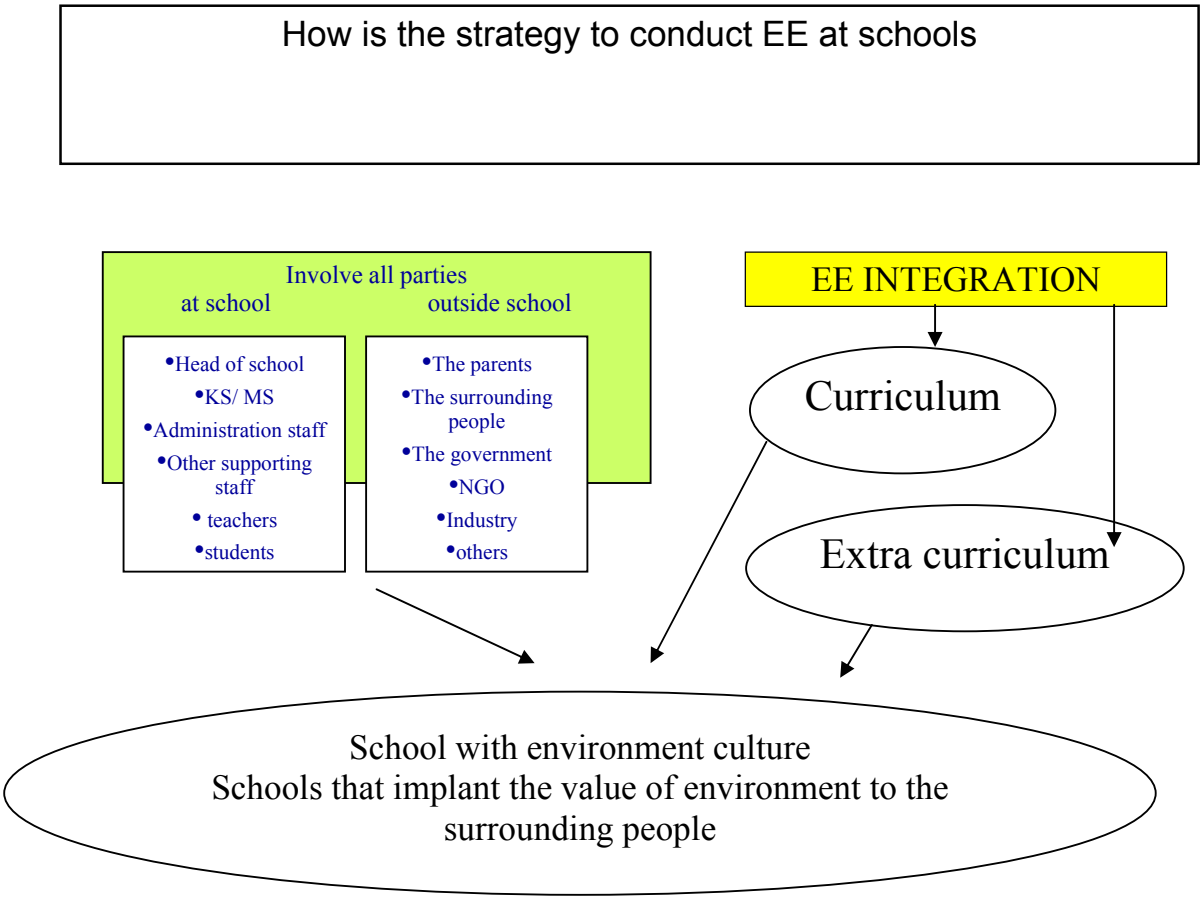
A. Recommendation for Formal Education:

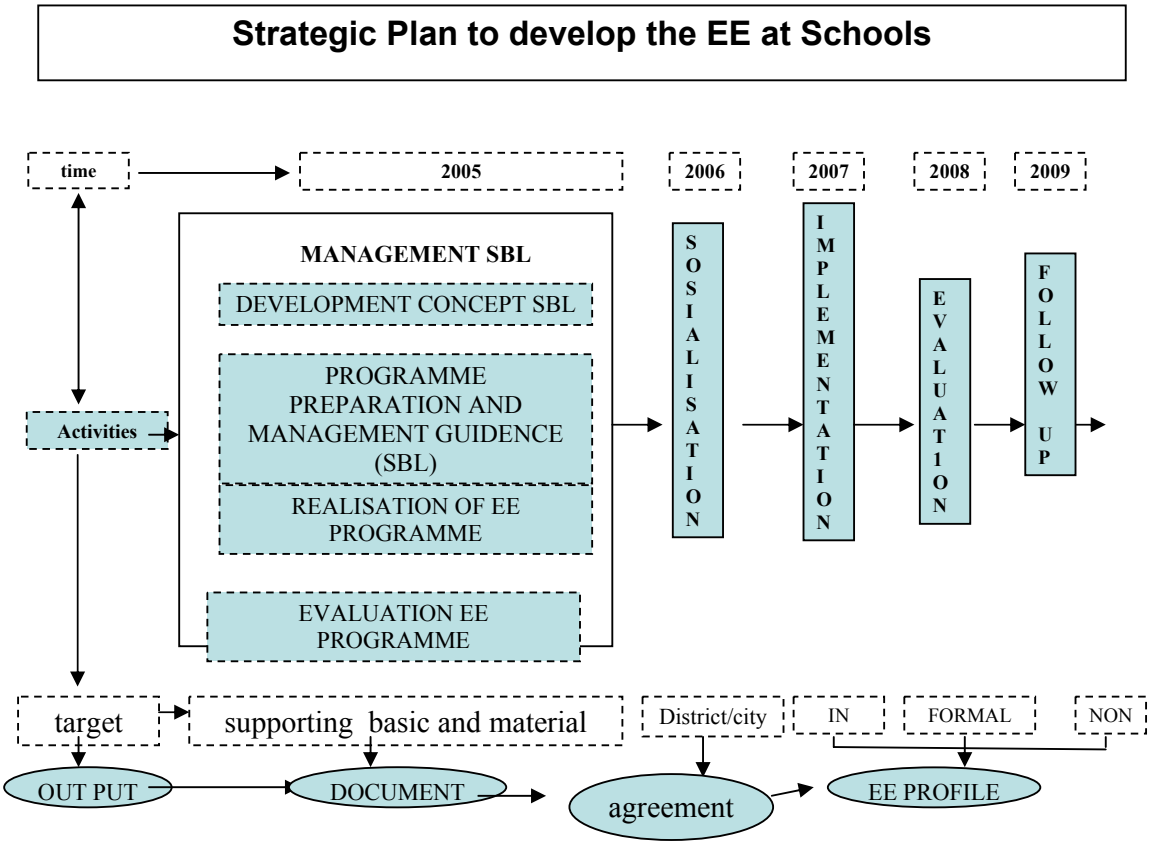
The environment education for the students at school are not only about understanding the knowledge of environment, but also the formation of the right attitude, the ability to analyse the environment problems, therefore the methods should be:

a. working group
b. work at laboratories and repair shop
c. project work
d. social work
e. industrial visit and practical
f. activities related with the environment

Procedure of EE application at the curriculum activities are as follows:

a. The commitment of all school members
b. Identification the environment problems and suit to the basic competence and the indicator of the EE curriculum.
c. Make programmes by choosing the EE material
d. Syllabus preparing
e. Conducting the teaching of integrated EE
f. Monitor and evaluate the process and results





B. Recommendations for Non Formal and Informal Education:

1. Strengthen the network and collaboration
2. Need plant information centre that publish widely
3. Develop the human resource capability through education, workshop and training
4. Need an update the method to transfer the EE material to the students made by the network
5. Institutions with the biodiversity as a basic such as Botanical garden, Centre for Biological Research, LIPI need to pro active in conducting education programme. For example by distributing the conservation ambassador to the schools or the teams that educate plant conservation to the students and teachers
6. The books that published by LIPI should be printed for teachers, schools, universities for free and the distribution mechanism should be fast and precise.
7. Need special programme to make the information media such as books and brochures. The books of guidance for introducing plants nationally and regionally are needed. Bogor botanical garden and Herbarium Bogoriense could become pioneer to do this.
8. Information sharing and cooperation among LIPI, Ministry of education and Ministry of Environment need to be done to distribute the information and the information media for schools
9. Funding institutions need to support the distribution of information, such as BGCI, Private company and society communities.
10. Recommendation will be shares to other countries of the world, therefore this recommendation will be addressed to stakeholders throughout the world.

Indicators proposed for T14's success and progress

The indicators proposed will include all aspects in education of plant diversity and conservation, which comprise of awareness, attitude, skill, knowledge, participation, independent/self ability

Quantitative indicator could be determined but not too rigid/strict, because Indonesia is a heterogenic and very large country. In general those indicators are:

- Environment cleanliness, i.e. clean from garbage and dangerous waste
- More plants at city areas, in the yard and lawn
- A dynamic equilibrium of the ecosystem is guaranteed (reduce in flooding, drying, and burning/fired
- More food variation from plants (the people are becoming more healthy.
- Use wisely and sustainable of the products from plants (not wasteful)
- Awareness and sensitiveness to the natural resources and its problems
- Understand the knowledge and concept of the natural resource, problems, roles and resposibility.
- Having the attitude on the social values, strong awareness feeling to the natural resource, motivation/ antusiacm to involve actively in natural resource (plant) conservation and its sustainable uses at local or national level.
- Development role and individual partisipation as well as tradition people grouplocally, regionally and nationally in the management, useness and conservation the biodiversity resources.
- The involvement of stakeholders to develop environment and biodiversity education
- The increase of the awareness and capacity of teachers group, reporter, industrial people, parents and NGO
- The availability of the module for environment and biodiversity education that developed by teachers, researcher, universities, etc.
- More articles and discussion about the environment and biodiversities exposed by press.
- The availability of models of module development and studying methods.
- The model developed can become materials for motivating the teacher to be actively involved and become the input for education policy makers to support the management of long-lasting (sustainable) environment and biodiversity.

A. Formal education

1. The documents as indicators for formal education are already prepared for each curriculum, including integrated curriculum.
    a. National standard and competence map 2004 and 2006 for primary school, junior high school and senior high school.
    b. Integrated modules for EE published by Universities, NGO, Government Institutions, Local Government, education network, etc. include T14 indicators for success and progress
    c. Curriculum at Universities about plants diversity and its conservation is also available already (usually Faculty Biology, Faculty of Forestry, Faculty of Agriculture)
2. For curriculum at formal education in general, the indicators for T14's success and progress include:
    a. The ability to understand (verbal information) about plant diversity and conservation

b. Intellectual competence in the subject of plant diversity and conservation that comprised of (a) discrimination, (b) concrete concept, (c) defined concept, (d) rule, and (e) higher order rule
c. Cognitive strategy in developing and broader the knowledge about plant diversity and conservation
d. Attitude to plant diversity and conservation
e. The psychomotor skill in developing plant diversity and preventing the loss of plant diversity.
f. The school yard becomes green as a representative of love to the plants.
g. The students like to do the outdoor activities.
h. The increase of curiosity and research in plants
i. Love and protect the plant's diversity
j. Use of the plants product wisely and sustainable

3. The development of the education curriculum about the importance mean of the biodiversity management, use and conservation for the people living wisely, balance, responsible and sustainable for present and future generation

B. Informal and Non Formal

The document explaining the indicators for non formal and informal education are already prepared:

a. IBSAP → Bappenas, 2003 as a translation of CBD
b. RTPB → the success indicator, programme and activities → Ministry of Environment 2004
c. The environment education policy → Ministry of Environment, 2003

The indicators for non formal and informal are:

- The increase of the nature lovers groups and NGO that aware to the plants
- The increase of volunteer at the national parks
- The increase of botanic gardens visitors.
- The increase of business people aware of natural products (Body Shop, herbal medicine etc.)
- The increase of plants tours activities, gardens and plants magazine
- More plants lovers, traders etc.

Challenges and opportunities for delivering T14

A. Formal education

- The environment and biodiversity problems locally should be included in the education materials.
- Develop the learning processes which are open, active, dialogist and applicative at school.
- Respect to the ability and autonomy of schools
- Urge and motivate the ability of teachers and organise the teacher's forum.
- Urge the policy of public education that supporting to the environment
- Education is not only inside the class, more practical proportion should be applied
- The material of education are too difficult for teachers and students, it need to be simplified
- The human resources quality should be increased
- The learning process should be fun for teachers and students
- The students are not only know but they should be understood

The government policy that endeavour the natural resources sustainable/long lasting should be related in the school curriculum and need the continuity of the curriculum from primary school, junior high school, senior high school and universities. The assessment of the students is not only the cognitive ability but also the psychomotor skill.

Develop schools model such as "ecoschool", "green school" and "nature school", the establish new botanical gardens at provinces, national parks and city parks for education. The involvement of local government is needed to motivate schools at their area.

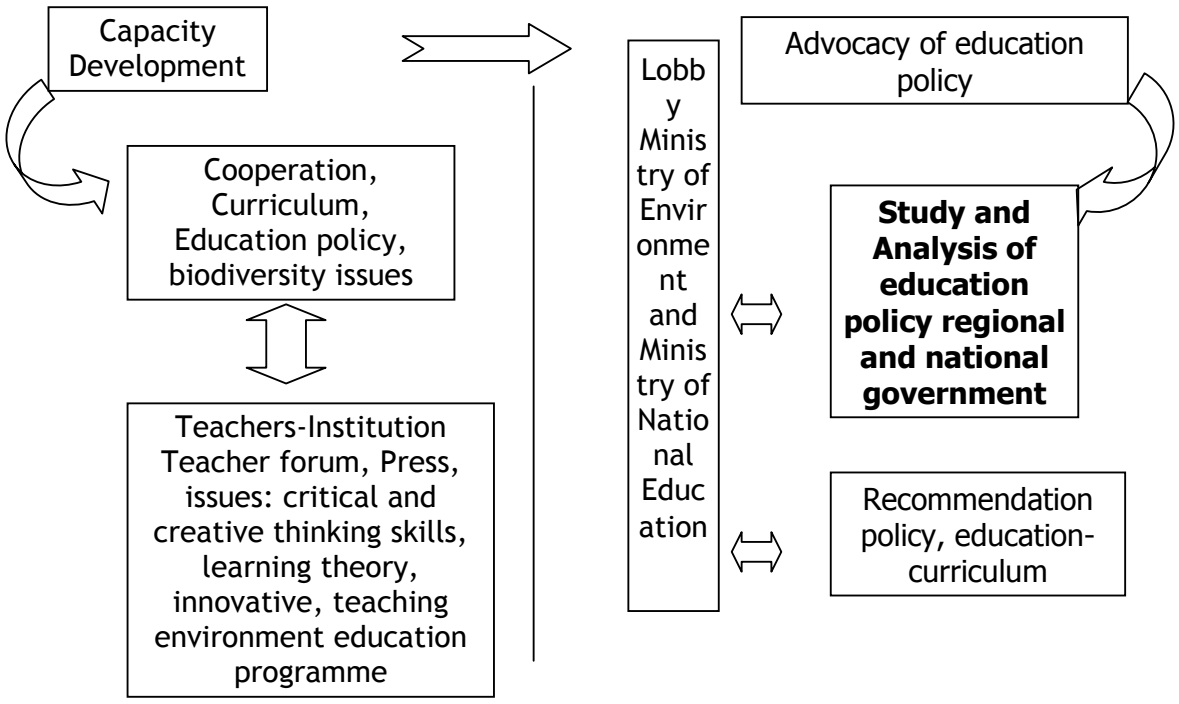
Evaluate and monitor the school competition that could encourage the interesting of the students to the environment including plants, therefore the students will love plants, have a commitment to the environment and the endangered plants. The cooperation among local government, teachers (not only biological teachers), parents, universities and botanical gardens is needed, such as the establishment of school parks by industries, NGO and local government.

The availability of specific subject for business schools, management schools, informatics schools that learning the plants (the structure, anatomy, ecology). There is also the a project work that involve the student competitive that supported by computer. These will not focusing the cognitive aspect but the psychomotor and affective.

The national curriculum need to be added with the figures explanations and the teaching process should be like a workshop. It is too difficult if the teaching process is done only by reading.

The most important is how to develop the curriculum of plants diversity and conservation that could solve the environment problems. The direction is needed with regards to the policy, approach and application of the changes of education process.

The strategy of EE at schools



B. Non formal and informal education

- Develop the people awareness to the environment and biodiversity by mass media information (printing and electronic).
- Establish the environment reporter forum.
- Increase the public awareness by:
    1. Elucidation
    2. Increase the appreciation → the value need to be increased
    3. Campaign → such as the celebration of special days related with the environment (integrative).
    4. Increase the feeling of love to the environment
    5. Appreciations ("adipura" (the cleanest city), "kalpataru" (for activist), kehati MAB awards, environment ambassador)
- EE should be nationalised through the integrated system and good packages. If needed, it could be involved the celebrities and icons.
- Related with plants as an icon, it needs to think the icons of plants besides the animal. It need creativities.
- Press/ mass media could educate the biodiversity (printing or electronic)
- The stakeholders like reporters, teachers, artists, NGOs, Industries is the mediator or agent of change for EE, therefore it is need to increase their knowledge and understanding of

environment and biodiversity (for example the interaction of plants and ecosystem that service the ecology)
- The awareness of the teacher and other stakeholders (executives, legislative people, and educated people) to the biodiversity and environment problems locally as well as the importance of environment education should be increased
- Develop the existence of the informal groups and concern with the right functions. The informal groups are NGO, Boy Scouts, Nature lover groups and Outbound programme.
- The environment people could talk about their interest with local government and other people using their interest to achieve the conservation aims.
- Actively learning from the resource person (farmer, fisher, animal breeder, businessman), watch the real activities and do the field application will help the process of teaching
- Ministry of National Education and institution related with environment issues, such as Ministry of environment, Ministry of forestry, Ministry of Agriculture, Ministry of fishery and ocean, Indonesian Institute of Science, etc. need to consolidate the programmes in developing teacher motivation and capacities in understanding the environment problems and develop the EE as well as the natural resources conservation activities.
- Cooperation with industries or business to help in "biodiversity marketing" through developing the alternative and popular mass media and increase the business involvement in managing the natural resources sustainable/long-lasting
- Increase the quality of informal education, such as Nature lovers group, Boy Scout, NGO, Outbound, for example by assistance for their activities, training etc.
- For outbound as a trend , it could become a good opportunities to promote the important of plants diversity and conservation.
- Clear rules and sanction
- Conduct the real actions.
- Strengthen the stakeholders network
- Use the local and tradition knowledge and wisdom
- Develop the people economy with plants as a basis
- Need to endeavor the research and non research institutions
- Integrate the education of plant diversity and conservation with other aspects to make it efficient and effective

C. Botanical Garden
- One of the main duties of Botanical Garden is to conduct environment education.
- The amount of the visitors could reach 1.2 million per year. 20-30% of the visitors is students.
- The strength of EE in the Botanical Gardens is the availability of plant collection.
- The materials of EE at the BG could be biodiversity, ecosystem, conservation, plant propagation, ethnobotany, etc.
- Networking and meeting with stakeholders are very important

Report from the Symposium on Target 14 of the GSPC compiled by Dr. Reni Lestari, Staff Researcher, Center for Plant Conservation, Bogor Botanic Gardens, Indonesia.

For more information, see the website, www.bgci.org/education or www.plants2010.org