

Present Situation and Practical Issues of Environmental Education for Sustainable Development in Japan and Indonesia

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Keywords: university, enterprise, eco-school, ASPNet, preventive maintenance, school building conditions, main materials, textbooks, environmental education, local content

Introduction

by Hiroyuki MIYAKE

The “United Nations Decade of ESD” started in 2005 and ended in 2014. It has been a good influence and impact onto people around the world, although ESD has not spread out as wide as expected. As Japan was an organizing member to call for ESD, it has gradually been introduced

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into Japanese society. In the case of other Asian countries including Indonesia, some universities responded well to this call, but for the most part, ESD has not been spread out in many Asian countries. Although most schools in Asian countries do not know about ESD, partial methods and concepts of education can be introduced into individual schools having similar effects of ESD.

This article covers various aspects of ESD in Japan and Indonesia. Miyake targeted ESD of universities and enterprises in Japan. Kodama researched school facilities and ESD programs in Japan and Kitakyushu. While the Adiwiyata School Program is encouraging, Syafrudie pointed out areas in need of improvement in terms of materials and designs of schools. Utaya and others targeted the content of textbooks of junior high schools in terms of environmental education.

1. ESD at the university level and enterprise level in Japan

by Hiroyuki MIYAKE

ESD is a kind of educational style that targets all generations and fields. Both universities and enterprises should, therefore, be covered in this concept. In this chapter, we will explain how universities and enterprises promote ESD in Japan and what they want to inform.

(1) University network on ESD and advanced universities

Before the concept of ESD spread out in Japan, the Ministry of Education, Culture, Sports, Science, and Technology (hereafter, MEXT) subsidized a project called the “Supporting program to meet modern educational requirements (Modern GP)” in order to revitalize higher education. Many universities tried to enhance their curricula and policies to reflect the recommendations made by MEXT and society in general. Such policy issues were raised by various councils and the Comprehensive Science and Technology Conference. In September 2004, MEXT announced that 86 universities were selected out of a total of 559 applications to receive funding.

Cooperation is an important part of ESD, so the Higher Education for Sustainable Development (HESD) Forum was set up to exchange information between universities receiving ESD-related subsidies. Iwate Univ. and Rikkyo Univ. played central roles in managing the HESD Forum. Every year, the forum was held at a different university.

Iwate Univ. held the HESD Forum in 2007 where Iwate Univ.'s Committee of ESD Promotion organized 17 presentations by participants from invited universities. Iwate Univ. gave a presentation about reforming general education to include ESD at the forum. There were seven important factors: 1. a body to gather general educational subjects in all faculties, 2. a bridge between general education and technical education, 3. cooperation with universities in the world, 4. cooperation between kindergartens, primary schools, junior high schools, and high schools at the local level, 5. communication between students of high schools, citizens, and enterprises, 6. cooperation between universities in Japan, 7. an appealed point for evaluation of university. The reformation or reconstruction of the general education system to include ESD was given the name, “Galaxy of Learning,” which relates to Kenji MIYAZAWA. He was a poet and novelist who was famous for incorporating elements from his own local background in his literature¹⁾. An international symposium was held on “Education for a Sustainable Future: the Role of Asian Universities and Opportunities for Collaboration” with members from Korea, China, Cambodia,

UNESCO, and the Chancellor of Iwate Univ.

The forum has been held every year at the following universities: in 2007 at Iwate Univ., in 2008 at Rikkyo Univ., in 2009 at Okayama Univ., in 2010 at Sophia Univ., in 2011 at Tokushima Univ., in 2012 at Kyoto Univ., in 2013 at Kanazawa Univ., in 2014 at Nagoya City Univ., in 2015 at Ryukyu Univ., in 2016 at Hokkaido Univ., and in 2017 at Ritsumeikan Univ. The United Nations Decade of ESD (DESD) ended in 2014, and the second stage of ESD has started to expand the size of HESD, but the discussion in the general meeting of 2014 at Nagoya City Univ., clearly showed the reality and the numerous problems facing HESD. One is related to the expansion and continuity of HESD. The level of recognition about the DESD by people in higher education, namely university teachers, is still low, and successors cannot be found after present participants retire from their universities. It is also difficult to register as an organization, so groups tend to register themselves on a smaller scale such as research groups or individuals²⁾. On the other hand, there have been positive outcomes of expansion or promotion of ESD in universities. Although the Univ. of Kitakyushu has not been registered to HESD, many kinds of ESD programs and projects are ongoing and many teachers have committed to them. Whether to become a member or not has been in discussion.

Apart from the HESD Forum, there are other university networks related to ESD in the world. Suzuki (2014, p. 94) discussed ProSPER.NET (Promotion of Sustainability in Postgraduate Education and Research Network), ASPUnivNet, and HESI (Higher Education for Sustainability Initiative). ProSPER.NET which was set up in June, 2008 after adoption of its charter in November, 2007 has pursued sustainability of education and research at the graduate school level. The network consists of 28 higher education organizations with graduate school programs dealing with sustainable development in Asia and the Pacific region. ASPUnivNet is a network of universities which support UNESCO-associated schools to improve the present educational level in each region. Okayama Univ. was the secretariat of the body in 2013-14.

The HESI consists of 272 bodies from 47 countries. Bunkyo Univ. and Chuo Univ. are registered universities from Japan. Mainly, they work on 1) teaching the concepts of ESD as a part of core curricula, 2) promoting SD research, 3) making campuses much greener through the reduction of their environmental footprints and purchasing ecofriendly products, and 4) providing sustainable traffic methods, the 3-Rs of waste, and the promotion of sustainable lifestyles.

However, the size of these networks is so small. Therefore, more universities should be included in these networks. The following four points were proposed by Suzuki (2012, p. 95) as

roles for higher education: 1) construction of a base of local knowledge on SD, 2) ESD education for youth, 3) training and retraining of teachers on ESD, and 4) contribution to local society.

Looking at recent trends regarding the needs of university faculty, many universities, particularly in rural areas, are set up for regional development. The curriculums of these faculties already have ESD elements, so host universities of existing networks or influential ones should invite them to join their networks. The larger the size of the networks are, the better the outcomes of ESD produced by discussion among them are.

(2) Introduction of ESD program of Univ. of Kitakyushu as an advanced university

Kitakyushu was very notorious for being a polluted city in the 1950s and 60s. Women could not endure the situation where their families were harmed by pollution, and they started to organize their own movement against severe pollution. They studied about the environment under the guidance of a professor, conducted a survey on the relationship between air pollution level and student absentee rate, and made an 8mm documentary film reporting the reality to others. It resulted in a pollution control agreement between the city's administrative body and local companies. Influenced by the energy shift from coal to petroleum in 1960s, Kitakyushu succeeded in repairing its environment, and recently received many awards for its commitment to environmental improvement.

The Univ. of Kitakyushu newly set up the Faculty of Environmental Engineering in 2001 and the School of Regional Development in 2006, adding to the existing four faculties. After the UN Decade of ESD started, Kitakyushu was recognized as a Regional Center of Expertise (RCE) in 2006. The Univ. of Kitakyushu has not played an active role in promoting ESD to citizens as well as students. After receiving a grant from MEXT, the Univ. of Kitakyushu opened the Manabito ESD Station located in the center of Kokura, Kitakyushu in 2012. It is a collaboration of 10 Kitakyushu area universities where many students have visited and joined many new projects. So far, there have been 28 projects that aim to contribute to the revitalization of local society as well as problem-solving. The projects have been a good opportunity for students and community members to gather and interact. One project named Green Bird has garnered much attention. It is a volunteer organization that aims to clean local areas and collect litter.

Furthermore, the Univ. of Kitakyushu has set up the Regional Development Center that provides a gathering space for students to work on projects. There have been many projects executed by students under the guidance of university teachers. Over 1500 students have been

involved. Students of the School of Regional Development receive academic credit for these projects. Therefore, the projects are directly linked to the students' university experience and graduation. An environmental ESD course has also been made available. Successful students can receive a certificate for a secondary major in environmental ESD studies. Most of the subjects in the environmental ESD course are existing ones which teachers of the six faculties have already prepared in their own faculties. In the last four years, the students registered in the environmental ESD course have had a chance to go abroad to places like Danang, Vietnam and Tongyeong, South Korea. In general education subjects, some teachers have tried to teach their subjects in terms of ESD.

2) ESD at the enterprise level

(1) Comprehensive Program of EE (Environmental Education) in Nagoya area

In Aichi prefecture, the Nagoya Chamber of Commerce and Industry (NCCI) is an important coordinator promoting ESD among local businesses. Established in 2010 in Nagoya, the "Meisho Eco Club" consists of 150 enterprises. They have done particularly well in promoting environmental education as part of their ESD activities. They conduct various projects including workshops to observe companies in terms of environmental protection, lectures (for example, the title of one lecture, "Challenge to ZEB, zero-energy building"), nature conservation activities, etc. Member businesses themselves also have their own projects.

According to a survey conducted by NCCI, the most popular activity is to raise awareness of workers through activities such as eco-cap campaigns, campaigns to switch off lights at lunch time, and displays of posters promoting energy-saving. Also, there are examples of groups gathering to clean neighborhood areas near their businesses. Another company offered an environmental education lecture to employees. Reasons for conducting EE include the desire to make contributions to sustainable development, to match management and environmental strategies of the enterprises, and to improve the image of companies. (Nagoya Chamber of Commerce and Industry, 2014, p.1-2)

Nagoya is quite advanced in their promotion of environmental education, so citizens have many opportunities to enjoy learning about environmental education. The Environment Partnership Club, Aichi Environment Job School, and Nagoya Environmental Univ., which have a network among many stakeholders like Nagoya City Hall, enterprises, universities, NPOs, and citizens, are the most popular bodies (NCCI, 2014, p. 19). NCCI explained their EE system to

enterprises in the following Table 1. It suggested to start from the inside of one's own enterprise at an easy level and gradually change direction to the outside of the enterprise at a higher level. Enterprises which have already introduced EE are classified in accordance with contents of EE.

Table 1 Environmental Education by enterprise

<div>inside of enterprise</div> <div>↑</div> <div>place to do</div> <div>↓</div> <div>outside of enterprise</div>	(1) EE to workers	<div>*improvement of EE system</div> <div>*classwise training & study meeting</div>	<div>*training of environmental leaders at work place</div> <div>*distribution of environmental information</div> <div>*recommendation to get environmental licence</div>	<div>*use of Eco Action21 & ISO14001</div> <div>*participatory environmental management by all members</div>
	(2) Action of environmental & social contribution	<div>*cleaning activity of locality</div> <div>*action of social contribution</div>	<div>*assistance to environmental protection bodies</div>	<div>*environmental protection campaign with administrative body & NGO</div>
	(3) EE to school and locality	<div>*acceptance of student intern</div>	<div>*EE utilized enterprise's own facility</div> <div>*reuse of retired worker</div>	<div>*direct EE at school by sending staff</div> <div>*EE introduced ESD concept</div>
		<div>low ←———— level of difficulty to do —————→ high</div>		

Source: NCCI, 2010, p.3.

2) Cases of large-scale companies' ESD programs

Apart from ESD programs done in local areas like NCCI, other types of ESD programs are being carried out by large corporations. The following two cases will be explained here.

One is the SAVE JAPAN PROJECT by Sompo Japan Nipponkoa Insurance Inc., which donated money to environmental NGO/NPOs and other organizations. Such funds were used by environmental NGO/NPOs as well as the Japan NGO Center to hold community-based biodiversity conservation events in various regions of Japan. In the last five years, there have been 30,000 participants in a total of 600 events. Sompo Japan received the Judge Panel Special Award of Encouragement at the 2015 Awards for Companies Promoting Experience-based Learning Activities for the Youth³⁾. Sompo Japan started programs of social contribution in 1992 when the president participated in the Earth Summit in Rio de Janeiro. He made a commitment to reduce the environmental burden of his company, and quickly set up an environmental protection

group (UNDESD related ministries' conference, 2014, p. 91).

The second company is Ito En, a famous tea company which received the Award of Sustainable Development Goals (SDG) Partnership as a special award in the first Japan SDGs Award. In May, 2013, the Ito En group decided to make basic guidelines to promote ESD, in order to promote human resources who can construct a sustainable society as well as promote collaboration with concerned people, and to intensify CSR promotion based on ISO26000. These guidelines include the following promotion points:⁴⁾ 1) implementation of in-house training on CSR/CSV and environment, 2) implementation of practical education in cooperation with the people involved like symposiums, introduction of ESD programs of Ito En, etc., 3) promotion of ESD in-house, 4) sending out information on ESD programs in the form of HP and CSR reports, 5) intensifying the cooperative relationship between the company and people involved in activities

It has already started a lot of programs including publishing a sustainability report, creating a long dialogue with stakeholders, and following basic guidelines of ESD promotion.

As shown above, we could understand the scale, contents, and methods of ESD at the university level and enterprise level. But, the expansion of ESD at both levels has been so limited and small overall. Recently, CSV (Creating Shared Value) has garnered attention as it covers basic concepts of education for both universities and enterprises. Enterprises will be required to introduce ESD to promote both CSV and CSR (Corporate Social Responsibility) more and more.

Notes

- 1) <http://esd.iwate-u.ac.jp/sem/hesd01.pdf> accessed Jan 7, 2018.
- 2) <http://www.hokuriku-esd.org/wp-content/uploads/2015/07/HESD2014.pdf> accessed Jan 4, 2018.
- 3) http://www.sjnk.co.jp/~media/SJNK/files/English/news/sjnk/2016/e_20160217_1.pdf. Accessed Dec 24, 2017.
- 4) <http://www.itoen.co.jp/csrfpolicy/#5> accessed Jan 4, 2018.

2. Environmental education for sustainable development in formal education in Japan

by Yayoi Kodama

(1) Changes in school environment and eco-schools

Students spend a large part of their days at a school that is a learning environment and a living environment. The school can be said to be the most basic place to learn about the environment around us. In their daily school lives, they will cultivate their ability to nurture environmental concerns and improve the environment. How do students interact with their school environment? Schools in Japan have been built based on school installation criteria and have maintained a certain level of learning environment and living environment. School environments for students, such as classrooms, playgrounds, gymnasiums, pools, libraries, science rooms, music rooms, home economics rooms, and infirmaries mostly meet nationwide standards. These are the places that students are learning and living for so much of their day. It may come as a surprise to non-Japanese that students clean their classes themselves. Cleaning classrooms is considered as one of their educational activities, and when students come to school, they clean every day. Students become conscious that school is a valuable environment which they should cherish.

Schools in Japan, especially public elementary and junior high schools, have been positioned as schools for the community. The compulsory education system in Japan is a school district system, and the school is basically a system that students live in. Large quantities of school buildings disappeared due to the damage caused by World War II, and restoration of school facilities in large cities such as Tokyo was urgent (from wooden school buildings to reinforced concrete school buildings).⁵⁾

Since public elementary and junior high schools were built according to old building standards, earthquake resistance has been a concern in recent years, but as a result of deteriorating fiscal circumstances, earthquake resistance had not progressed at a satisfactory rate. However, since to the Great Earthquake in 2011, public elementary and junior high schools' earthquake resistance preparations have advanced rapidly. Today, public elementary and junior high schools are getting older, and this change has become a serious problem. Many of these schools were constructed in line with the rapid increase in the number of students (the second baby boom). 53% of public school facility areas were built between 1972 and 1986, and about 70% of the buildings were built 25 years or more ago.⁶⁾ Buildings built more than 40 years ago have to be rebuilt fundamentally.

However, in 2014, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) launched a new way of thinking to respond to the aging of schools built in the rapid increase of the baby boom. Rather than a full rebuild, it is the concept of "long life" that enhances durability by partial and full repair. In other words, it acknowledges the struggle between financial difficulties and aging facility problems. The ministry prompts local governments to promote measures based on this idea.

On the other hand, the "Eco School Plus Project" has been implemented as part of environmentally friendly improvement of public facilities. This is a project renamed as "Eco School Pilot Model Project" from 2017. The project is related to the four ministries such as MEXT, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Economy, Trade and Industry, and the Ministry of the Environment. 1,663 schools were certified from 1997 to 2016. After the "Eco School Plus Project", 41 schools were certified, and in 21 years a total of 1,703 schools were certified as "Eco Schools"

year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
accredited schools	18	20	20	41	58	88	97	98	101	70	79
year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	計
accredited schools	104	157	175	134	112	112	80	47	52	41	1703

Table 1 Trend in Eco-Schools Certified Schools

According to MEXT, an eco-school is “a school facility that considers reduction of environmental burdens and harmonious coexistence with nature” and “utilization as a teaching method of environmental education”. Moreover, it is not only beneficial for children, it is expected to become “a base for sending environmental and energy education” for the region, and it is expected to play a leading role in measures against global warming, and it is important to pay attention to the following points:⁷⁾

Decrease: Insulation and high efficiency of equipment

Utilize: Utilize the grace of nature

Create: Utilizing the latest technology

Looks: Visualization of mechanism, principle, energy consumption

Grow: to use for education

Eco-schools install equipment utilizing the latest technology and visualization so that

students can understand the mechanism and use energy efficiently. Eco-schools make the process of environmentally friendly systems easy to see. Teachers use the visuals as a teaching method to help students learn. This is the concept of eco-school. When a school receives eco-school certification, facility equipment funds are also received and new assistance such as preferential adoption of subsidized projects can be received from related ministries in new construction, extension, and refurbishment of school facilities.

Schools accredited as "Eco School Plus" include eight types such as solar or new energy types for schools that utilize solar energy or alternative energies, energy/resource-saving types that use heat insulation and drainage reuse, recycling types that install garbage disposal facilities or utilizes recycled building materials, coexistence with nature types that "green out" buildings and surroundings, and wooden interior types that cooperate with local forestry industry. Among these types, energy-saving and resource-saving eco-schools are the most frequent, followed by types utilizing solar energy, and local wood-based types.

More than 240 schools of coexistence with nature types have been certified from 2008 to 2017. Some of them maintain "green curtains" on the walls of schools or grow lawns on their playgrounds, and the other schools set up biotopes in schoolyards. According to Shibasaki et al. (2016), as schools are made greener in the maintenance of outdoor facilities, the problem of "ignoring suitable land for living organisms" was raised.⁸⁾ Japan is an island country spreading north and south, and there is a wide variance in temperature. In addition, the climate is very different due to the difference of rainfall on the Pacific side and the Japan Sea side due to the mountain range and seasonal winds. Such a difference in the environment has nurtured rich nature; however, the environment in the premises of schools did not reflect their natural environment. For that reason Shibasaki and his colleagues propose to plant trees that connect forest nature and agricultural nature in the school grounds as part of the Japanese concept of *satoyama*. Biotopes in the eco-schools are created while considering the planting in local conditions. Students learn to coexist with nature in small *satoyama* in school.

Eco-friendly school facilities themselves become good teaching methods for learning. Many teachers who belong to eco-schools have devised lessons using school facilities. They especially have been put to good use when teaching science subjects (units about energy) and social studies (units about the protection of the environment). Other teachers plan to learn about "Eco School" in the "Period for Integrated Studies". In addition, 96% of certified eco-schools conduct environmental/energy education other than classes, and 76% are conducting activities to

spread eco-school efforts in the area.⁹⁾ Schools where eco-school facilities are used for teaching methods can also be seen. For example, in a school where facilities related to the environment such as a rainwater storage tank are installed near students, students learn about the facilities and actually use the facilities to improve environmental awareness. Efforts are under way in various schools where environmental education has been started as a result of being certified as an eco-school. For example, students of one elementary school painted plastic bottles black to heat water using sunlight, use the warm water, and clean the classroom. Students use their knowledge and devise ways to make their school life more comfortable. Another eco-school conducts “zero-meal” feeding (efforts to reduce waste of school lunch). The students of the school not only make efforts to not have leftovers, but they also make compost using EM bacteria when there is leftover waste. The students use that fertilizer in the farms and flower beds of the school.¹⁰⁾

As mentioned above, while the aging of Japanese elementary and junior high schools has proceeded, renovation and repair are proceeding under the idea of “long life”. Although this is a policy against the background of financial difficulties, cherishing existing schools is also an idea of consideration for the environment and how to use finite resources. While many schools tend to renew this kind of school, some schools have taken measures to set up “school-friendly facilities”. In schools with school-friendly facilities, the school itself is the optimal teaching material for environmental education and students can learn about energy conservation and resource saving through the use of school facilities. The school itself is a device that raises awareness of consideration for the environment not only for students but also for teachers and local people.

(2) ESD in curriculum of school education

In eco-schools, by changing the hardware aspect to environmentally-friendly types, the school adopts a methodology to form environmental consciousness of people utilizing that system. However, many schools are not ready for improving the hardware aspects, but while developing software aspects, they nurture the ability to encourage school-related people to be conscious of the environment and encourage the environment. Among the cases with such software enhancement, the characteristic feature is the ASPNet (called UNESCO School in Japan) which will be discussed next.

“Education for Sustainable Development (ESD)” was proposed as an education towards a sustainable society, and the “Decade of ESD” proposed by Japan and adopted by the UN General

Assembly was implemented. In this period, “Period for Integrated Studies” was established in the curriculum guidelines for school education in Japan. The framework implemented since 2002 is a new concept to learn about the environment as part of the education for a "sustainable society", which is used complementary to the learning about the environment of each subject.¹¹⁾

	General Provisions	Social Studies			Science	Home Economics	Moral Education	Period for Integrated Studies	Foreign Language	Total
		Geography	History	Civics						
ES	1	6			4	2	1	2	3	19
JHS	1	12			14	10	1	3	0	41
HS	1	54		48	3	37		4	0	142

Table 2 "Sustainability" description in the explanation of current Curriculum

In the commentary on current guidelines for teaching (Table 2), the word “sustainable” is centered on in social studies, and there are many in the curriculums at junior and senior high schools. This was a significant change in the sense that it showed the ground for building the ESD curriculum at each school. The word “sustainable” is also used in the educational guidelines of elementary and junior high schools revised in 2017, and the framework of ESD is reflected in the new curriculum.

In general, many more elementary schools practice environmental education than junior high schools. Environmental education as “experience activities” is typical as well as “activities familiar with local nature” and “garbage separation and recycling activities”. Also, in elementary schools, “activities to nurture animals and plants” has been added.

In the case of Japan, schools called “UNESCO School (ASPNet)” promote ESD. According to a survey by the UNESCO National Committee, the contents implemented by the ASPNet in Period for Integrated Studies are environmental education (76.9%), international understanding education (51.7%), and world heritage/regional culture (42.8%). It is reported that schools joining this network make "environment" an important learning theme.¹²⁾

The ASPNet began as a network for promoting international understanding education. In Japan, this network of schools is positioned as a community promoting ESD. Currently, there are

about 10,000 schools internationally affiliated with this network.

During the Decade of ESD (2005-2014), ASPNet became the center of ESD promotion internationally. In Japan, ESD in school education expanded rapidly from the time when the wording such as “Building a sustainable society” was entered in the Basic Education Promotion Plan and the Curriculum Guideline in 2008. And it was the ASPNet that contributed to expanding this popularization. In 2007, there were 1,037 ASPNet schools in Japan including 524 elementary schools, 255 junior high schools, and 147 high schools in 2017.¹³⁾

By addressing ESD practice throughout the school that is to say with a whole school approach you can create a systematic and ordered school curriculum for all students. The core of school curriculum formation is Period for Integrated Studies crossing the subject. It plays a role of organically connecting learning in other subjects. Many schools that conduct ESD throughout the school plan a one-year school education. This is a curriculum for ESD, and it is created for each grade. Units of each subject are arranged in this table called “ESD calendar”, and related units are connected by lines. In other words, it is an ESD plan where people can understand the relationship of each topic at first glance.¹⁴⁾

Essentially, the unit of content related to ESD learning topics is shown in the calendar, but the units involved in learning skills are also indicated. This is an idea that all subjects and activities are related to ESD, and it is a basic idea when ESD is conducted throughout the school. Since the topics on comprehensive learning time are decided at each school, what kind of learning content is set is the key to advancing ESD.

(3) Environmental ESD at elementary schools in Kitakyushu

How is ESD being promoted at schools in Kitakyushu? In this section we will discuss the environmental education of eco-schools and ASPNet. Elementary schools are certified in both cases, so we will deal mainly with primary school ESD in this paper.

In the case of the city of Kitakyushu, which advocates eco-towns, efforts on the maintenance of environment are promoted by various organizations. Two elementary schools in Kitakyushu were certified as eco-school pilot model projects.¹⁵⁾ Minatogaoka Elementary School was renovated to a photovoltaic-type school as a result of consolidation. Sone-higashi Elementary School has arranged the Sone tidelands habitat within the school district, and has carried out conservation activities in the tidal flats. Since 2007, the renovation of photovoltaic power generation schools has been promoted, but this school traditionally carried out environmental

protection activities taking advantage of local conditions. Energy saving education is introduced in addition to natural environmental education triggered by being certified as an eco-school, but the main environmental education contents of this school are concerned with the nature in the school district, awareness of protecting nature itself, and using environmental preservation as a way to foster behavioral attitudes. Eco-schooling will be positioned as a school supplementing traditional education through facility improvement.¹⁶⁾

Many schools have been certified as eco-schools, and renovations and repairs are proceeding. In the case of Kitakyushu, eco-schools help promote the whole city. As part of the “School New Deal” initiative of the MEXT, solar power generation facilities such as elementary and junior high schools in Kitakyushu were improved and expanded. Only four of 203 schools had solar power generation facilities renewed by 2008. However in 2011, 198 schools (130 elementary schools, 62 junior high schools, and 6 special support schools) had set up some form of solar power generation facilities.¹⁷⁾

By installing photovoltaic power generation, students can learn about the process of power generation at school without going to a power plant (routinization and visualization of energy and resources). School is a place for students to consume energy and can attend a place to generate it. In other words, it is an environment where it is possible for students to think as to how to use energy and resources without waste.

Under these circumstances, six elementary schools in Kitakyushu were certified as ASPNet.¹⁸⁾ These schools are also promoting education and making full use of the conditions of each school district. Ainoshima Elementary School is located on Ainoshima Island in the Hibikinada ocean area north of Kitakyushu. Ainoshima is a historic island that has been documented in old texts. The school conducts environmental education through subjects and experiences. Akasaki Elementary School has taken advantage of the Period for Integrated Studies and has been promoting regional learning from the viewpoint of environment and energy. Ichimaru Elementary School is engaged in conservation activities of the endangered species *Gashamoku* (aquatic plant) in the school district as part of their environmental education that also shows pride in the countryside. Sayagatani Elementary School is a school that has traditionally worked on welfare education and environmental education. In 2009, this school made a biotope by using the school pond where students can learn about symbiosis with nature. Sugao Elementary School conducts ESD based on the environment as a form of learning about hometown. Fujimatsu Elementary School is conducting environmental education mainly for science education. The school is developing

programs to learn about nature observation and traditional culture making full use of human resources living in the area (school district).

This article considers ESD practice of Ainoshima Elementary School and Sugao Elementary School based on an interview survey. Kitakyushu is a city with a population of less than one million, but the concentration of the population varies greatly. Both schools are located in areas where population has been declining.

In Ainoshima Elementary School, which has been classified as a tiny-scale school, only has 14 students¹⁹⁾. Although it is relatively recent that this school was certified as ASPNet, the history of environmental education is long, and it has continued for about 20 years. The school is organizing a curriculum with activities concerned with “connection with people, society, and the natural environment”. Activities include promotion and preservation of traditional arts remaining in the community, island clean-up, food education that makes full use of the location of the fishery, the observation of *Sunameri* (finless porpoise) living around Ainoshima, and the survey of the natural environment through seawater. A joint team of companies and the Univ. of Tokyo are conducting research on the island potential for wind power generation as a result of offering cooperation to school education.²⁰⁾

Sugao Elementary School is a small school of 80 students. It was established when two area elementary schools were closed and reconfigured in 2008. Its predecessors took advantage of the conditions of the area even before the new school was established. Since being accredited as an ASPNet school in 2012, the school has vigorously implemented environmental education making full use of Period for Integrated Studies.²¹⁾ Sugao Elementary School has farms and a biotope, and nature and crops are close to the students. Students learn about the changes of the riverbank and the water quality by studying the Murasaki River that flows through the school district. They learn about such efforts to preserve the water quality by the people in the area, as students and local people create bamboo charcoal, and they make pickles using local products. In this way, students learn through experiences that they are doing various activities with their cooperators.

What is common to the two schools is that they are working on a whole school approach. This method of deciding study topics for each grade of their six years in elementary school is effective for students to continuously learn about the environment. Neither school is creating an ESD calendar. However, Ainoshima always puts environmental learning into the annual plan, and the curriculum plan of Sugao is similar in that it is based on comprehensive learning time as

the core, like the ESD calendar.

The other point is to take advantage of the local human network. Public schools in Japan, where faculty members have workplace transfers every few years tend to be struggling to maintain “continuity of education”. In the case of Ainoshima Elementary School and Sugao Elementary School, difficulties are further increased as they are small schools, but the human resources based on the regional human network play a big role in accumulating educational knowledge and experiences. Local people are proud to contribute to local human resource development, and we do not mind cooperating and contributing to education.²²⁾ Thus, both schools supplement the disadvantages of the transfer of faculty with the regional network.

Notes

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- 7) Ministry of Education, Culture, Sports, Science and Technology [2011]: Eco-school that utilizes nature's blessing
- 8) Shibasaki Naotaka, Nagashima Yasuo [2016]: Biotope: Outdoor school facilities facility supporting biodiversity education, Bulletin of Kanto Gakuen University Liberal Arts Vol. 24
- 9) Ministry of Education, Culture, Sports, Science and Technology Ministry of Agriculture, Forestry and Fisheries Ministry of Land, Infrastructure and Transport · Ministry of the Environment [2017]: Promoting improvement of school facilities considering eco-school environment
- 10) Ministry of Education, Culture, Sports, Science and Technology Ministry of Agriculture, Forestry and Fisheries Ministry of Land, Infrastructure and Transport · Ministry of the Environment [2016]: Promoting improvement of school facilities considering eco-school environment Eco-school pilot model project example collection
- 11) Yayoi Kodama [2017]: Environmental Education for Sustainable Development of UNESCO Associated Schools Project Network in Japan
- 12) Survey of the UNESCO National Committee
- 13) UNESCO School HP (Last Accessed Date November 11, 2017)
- 14) Toshima (current Principal / Yanagawa Elementary School Principal), one of the inventors, explained the ESD calendar as follows. The calendar is created so that any teacher in charge will be able to imagine how

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to progress comprehensive learning.

- 15) Ministry of Education, Culture, Sports, Science and Technology Eco-School Pilot Project Accredited School
- 16) Initiatives of Ministry of Education, Culture, Sports, Science and Technology Eco-School Pilot Project Accredited School
- 17) Kitakyushu City Environment White Paper According to the 2012 edition (2012), the remaining schools are scheduled to be installed according to renovation.
- 18) UNESCO School Activity Annual Report
- 19) Elementary and junior high schools in Japan basically need to increase classes if more than 40 students in a class are present, and are systems that arrange teachers according to the number of classes. However, it is possible to reduce the upper limit of one class to 35 people at the discretion of the area. The standard of school size appropriateness is grasped by class number. For elementary school, 12-18 classes are adequate schools (2-3 classes for 1st grade). In addition, schools of 5 classes or less are small schools, 6-11 classes are small schools, 19-30 classes are large schools, and 31 or more classes are oversized schools.
- 20) Interview with Aijima Elementary School principal, Mr. Hiroyuki Tsubone on August 29, 2017.
- 21) Interview with Sugao Elementary School vice principal, Mr. Minoru Tahara on June 25, 2017.
- 22) Interview with the president of the town development council on June 25, 2017.

3. Preventive maintenance, building conditions, and participants of the Adiwiyata School Programs in Indonesia

by Haris Anwar Syafrudie

Preventive maintenance according to regulation of Minister of Public Works number: 24/Prt/M/2008 30 December 2008 about guidance on maintenance of building, including post constricting, post-trauma. At this stage the maintenance of elementary school buildings is done periodically and routinely, when construction work is completed. Maintenance work includes: 1) maintenance of wall painting; 2) maintenance of door and window painting 3) anti-termite maintenance on the floor and around the building; 4) replacement of tile, floor and wall tiles.

According to Minister of Public Works regulation No. 24 the classification of maintenance work includes continuous (regular, routine) care; periodic maintenance, emergency repairs; total improvement and refinement. Continuous care includes: cleaning drainage channels from garbage and dirt; cleaning of rooms and yard from garbage and dirt; cleaning of glass, windows, chairs, tables, cabinets, etc. : grass clearing and irregular shrubs; cleaning and watering the bathroom / WC to maintain health.

Regular maintenance is a means of preventing damage. In other words, the lifetime of tools and means that is treated regularly longer. The maintenance will prevent the huge expenses that the Adiwiyata organizer's elementary school has to spend to replace the damaged components. Care is a conscious form of action to keep elementary school tools and facilities always in a ready-made state. Treatment can also be interpreted as an act of doing repairs until the condition of equipment and facilities can work again. Therefore, maintenance activities are required to be done in a planned, and programmed at certain times.

The activity of facilities and infrastructure of elementary school of Adiwiyata consists of periodic checking, cleaning, painting, and furniture. Tuning, cleaning, replacement, calibration of specific equipment are included. In other forms the treatment may be a small improvement done at one place in an elementary school, and if necessary replacement of components to improve the work force so that the operational cost of using the tool becomes more effective. Planning and utilization of school facilities and infrastructure in supporting the learning process has a direct influence to achieve learning objectives, and at the same time the means of education is one form of educational resources that have the role and function as a supporter of the success of the education process.

Decree of the Minister of National Education Number 031/0/2002 dated March 18, 2002 article 68 explicitly states that the government organizes the preparation of materials and the formulation of the policy of standardization of educational facilities. This is in accordance with Ministerial Decree number 129a / U / 2004 dated 04 October 2004, concerning Minimum Service Standards of Education. In order to improve the quality of education, the government has undertaken various efforts, among others, through improving the quality of school facilities and infrastructure, including building standards and basic school furniture. With the enactment of RI Law no. 32/2004 concerning Regional Government, Directorate General of Basic Education and Higher Education in the framework of improving the quality of education enforces elementary school autonomy through the program of Management of Quality Improvement Based on Elementary School (MPMBS). This program is conducted in various ways such as empowering educational resources that become supporters in the learning process.

Elementary school buildings are often designed to be used for 25 years. But due to the lack of preventive maintenance, the gutters should periodically be cleared of tree litter, during the rainy season, the water spills over the lisplank and the outer ceiling. Small holes due to rust on the guttering water line, which should immediately be sealed with anti-rust coated paint is not done, at 5 years of use, the gutters will be damaged. Because rarely cleaned gutter becomes like a trash bin, a lot of tree litter perforated gutters disposal. When it rains, the gutters that should function to regulate the flow of rain water do not work. As a result, the roof buffer frame becomes obsolete, the ceiling is damaged or collapsed, the color of the wall of the peyles faded due to mossy walls. When the gutter hole is still and regularly cleaned, then the wrong function will not happen. Therefore, preventive maintenance activities are required to be carried out in a planned and programmed manner. By doing preventive maintenance on elementary school buildings / building will directly improve the performance of equipment and supporting facilities. Preventive maintenance will reduce the cost of repairs on a large scale, and will be able to maximize the life of the used of building and its supporting equipment.

Preventive maintenance activities include periodic checking, cleaning, painting of buildings and furniture. Adjustment, cleaning, replacement in other forms preventive maintenance may be small improvements made at one place in the school, and if required replacement of components to improve the workability of the infrastructure so that the operational costs of using the infrastructure become more effective. Conducting preventive care programs encourages elementary schools to produce appropriate information in setting up maintenance schedules

for school buildings, libraries and other supporting buildings. Accurate data and analysis of the condition of the building is the main data to perform preventive maintenance for the life of the elementary school building in accordance with the durability of building as originally planned.

Indonesia is one of the countries that have humid tropical climate. Air humidity reaches approximately 80% with air temperature up to 18-33C during the day (Mangunwijaya, 1980). Natural resources in areas with a very abundant tropical humid climate are sun and wind. The sun provides many benefits to life. The sun provides light, warmth, builds health and provides energy. On the other hand, the wind gives coolness, freshness, aroma cleanliness and breathing relief. High air temperature does not feel disturbing when there is a wind gust. In coastal areas where the air temperature is hot is reduced by constant flow of sea breeze. However, the degree of humidity does not always have a positive effect. High degree of humidity was a negative impact on buildings and buildings. These negative impacts include: 1) the growth of organisms that embraces and destroys wood; 2) the growth of mold and mildew; 3) accelerate the process of rust on metal material

Based on Article 42 of Law No. 19 of 2005 on National Education Standards it is stated that each educational unit shall have facilities covering furniture, educational equipment, educational media, books and other learning resources, consumables, and other equipment necessary to support the learning process regularly and sustainably. It further states that every educational unit is required to have infrastructure covering land, classrooms, educational leadership room, educator room, administrative room, library room, multipurpose room, canteen, power and service installation, sports venues, places of worship, place of creation, and other space / place needed to support the regular and continuous learning process.

Maintenance activities on elementary school buildings are often overlooked. Although there is, often the budget for maintenance of buildings / school buildings is often small or non-existent. Preventive maintenance activities are intended to maintain facilities and infrastructure (physical buildings and other equipment), so that the life of the facilities in accordance with the planning, 25 years. By doing preventive maintenance avoided premature building damage.

Education facilities are one of the educational resources in it including building and school furniture. Basic education facilities need to get attention because it is one of the instrumental factors (instrumental input) which has an important role in the process of basic level learning. There needs to be a mapping of actual conditions in the field as a reference in the planning and procurement of primary school buildings and furnishings that give flexibility to schools to

have various alternative treatments and procurements offered in accordance with the abilities and desires of the school. The Adiwiyata School of implementation conducts school management and schooling to a caring and cultured school environment. The aspects that must be done to achieve Adiwiyata School are required to fulfill four components of Adiwiyata namely; environmentally sound policies, environment-based curriculum, participatory activities and the provision of environmentally friendly supporting facilities and infrastructure. Each school has the same benchmark standards in order to become a national Adiwiyata School.

This research activity aims to map the condition of elementary school building implementation of Adiwiyata and how the schools take care of facilities and infrastructure as base of elementary school physical facility. In elementary schools, the care of facilities and infrastructure is often overlooked. Often found care activities on elementary school buildings passed. There are often budgetary posts for the maintenance of small elementary school buildings. Preventive maintenance activities are intended to maintain facilities and infrastructure (physical buildings and other elementary school equipment), in order for the life of the elementary school infrastructure to be in line with the planning. By doing maintenance will be avoided the damage to elementary school buildings prematurely.

Naturally, the facilities and infrastructure that exist in elementary schools over time will be damaged. Damage caused by weather effects, changes in temperature, dust, dirt, misuse or lack of maintenance. These factors slowly over the long term diminish the function of parts of school infrastructure. Equipment and facilities that are not / less treated will be damaged (Syafurudie, 2003).

METHOD

The design of this research is survey by observing directly condition of the elementary school building section of the Adiwiyata School program implementer, which includes several indicators. These indicators are cleanliness, air circulation, lighting, paint color, wall condition, floor condition, standard area, teachers' room, principal room, bathroom and restroom (KM/WC), UKS, canteen, library, place of worship and warehouse. Other indicators are the availability of clean room facilities, KM/WC condition, School Health Room (UKS) and Canteen. Observation conducted on water sources, sanitation and waste management.

This research will explain the condition of physical component of elementary school

building participant of Adiwiyata program that all components are in good condition or in poor condition. The analytical unit of this research is observation component covering cleanliness, air circulation, lighting, paint color, floor condition, wide standard, condition of classroom wall, teacher room, principal room, bathroom and restroom, UKS, canteen, library, and warehouses that have been used in existing school systems.

Population in this research is the school implementing Adiwiyata program. The population in this study is not the school of cheeses obtained, but the school as the implementation of the Adiwiyata program. She is only participant and implementer of Adiwiyata program in Malang. The schools are SD Percobaan, SD Sarangan, SD Dinoyo II, SD Model Tlogowaru, and SD Kauman which are all located in Malang. Real data of school facilities and infrastructure being administrated then analyzed with descriptive analysis to see trends of each aspect studied on how preventive maintenance efforts done by the elementary school condition of existing school buildings.

Other data that is administered is the basic data belonging to each school. Data on infrastructure facilities, sanitation equipment, and school maintenance schedule of schools, procurement of materials and school maintenance schedule put into School Budget and Expenditure (RAPBS). The observed data were analyzed using descriptive statistic, to see the trend of each observed component. Calculated average, highest score, lowest score and central tendency on aspect observed include cleanliness, air circulation, lighting, paint color, floor condition, wide standard, condition of classroom wall, teacher room, principal room, bathroom and restroom, UKS, canteen, library, place of worship and warehouse

Through this research activity will be got accurate data and analysis result about current condition of school building. The study focused on the conditions and problems that arise during its use as an accurate mile stone mapping of problems that arise. The data can be obtained from research instances administrations. The data collected in this study are notes on the observation sheet, and the response to the instrument. The data obtained were analyzed descriptively to describe trend on each indicator. In order to know how the condition of elementary school preventive maintenance care is, data analysis is done by analyzing the results of field observations by using trends based on Excel worksheets in Office programs.

RESULTS AND DISCUSSION

Table 1.1. Component of Research Observation

No	Aspect	Classroom	Teacher room	Principal Room	Rest room	Library	Canteen	UKS	Ware house	Prayer room
1	cleanliness	10	10	10	10	8	10	10	7	10
2	Air ventilation	7	7	7	7	7	7	7	7	7
3	lighting	7	7	10	10	7	10	7	7	7
4	Paint color	7	7	10	7	7	7	7	7	7
5	Floor condition	10	10	10	7	7	7	10	7	7
6	Wall condition	10	10	10	10	10	7	7	7	7
7	Standart room area	10	10	8	10	7	7	7	5	5
8	Preventive maintenance	0	0	0	0	0	0	0	0	0

Scoring scale 1-10

In the classroom observed in all schools with a rating range of 1 to 10, the average classroom condition was average. Derived from the observation of all classes generally the class does not have planned air ventilation, the existing ventilation is generally not good enough to get rid of moisture in a classroom. Light in the classroom is generally dim, not bright enough when measured with lux mater, less bright class for students writing and reading, wall color classroom tends to dark blue, or dark green that makes the class looked darker, generally seen the quality of the wall the quality of the floor and the standard of the room is adequate for the classroom in the Elementary school.

The teachers' rooms, where the teachers gather and do administrative work outside of classroom, are generally in clean and good condition. Some of the teachers' rooms did not have good air ventilation, so the teachers would feel less refreshed while resting or doing other adminstrate work. The lack of air circulation is still followed by wall color conditions that tend to cause the room to be dark and dingy. In general, the teacher room meets adequate space stability, the quality of school walls is generally good and not peeling, and the floor condition with adequate pavement is neither slippery nor popping.

The condition of the principal's rooms is generally good. The school rooms are clean and the lighting is adequate, well enough for writing or reading. The condition of the floor of the principal's rooms is good, and it does not slip and there is not a peeled place. The wall condition is very good, and the paint condition is generally good and the color is in good condition. It's

just that the principal's room has not yet applied the calculation for air circulation to be good and perfect. Due to poor circulation the school then put AC in the principal's room. Some of the principal's rooms have a good wide range of standards, but some schools have poor room standards, and tend to be too narrow.

In all schools the library is not seen as a priority place developed by the school. The libraries in all schools are not very clean, lighting, paint colors and air vents are not good, condition of the paint is not good. In some schools a collection of old books is found. Circulation of books is not well organized and there is no special librarian. Officers are mostly teachers who are assisted to take care of the library during the hours when the students are at rest. Therefore, when examined, the officers do not know correctly the history of books circulated, the type of book up to predict the procurement of books in the future that will come for the purposes of updating the book collection. Libraries tend to school complement, not as center of excellence at school.

Not all schools have warehouses. School's warehouse encountered during the implementation of the study is a space that is left to function to store goods that are not used. Not goods that are reserves and goods that will be used later, but unused waste goods. Because it is the remaining space that is bad, too narrow, difficult and moist. The findings in this study of warehouses are generally less clean, less light, no good air circulation, the paint and the walls condition are not well maintained. The condition of the floor is not very good, because it is not strategic and rarely passed by people.

Though all schools in this research are public schools, places of worship are not places of worship for all religions. Places of worship in public schools in Malang means a place of Islamic religious worship called musholla. Places of worship are generally small, less light space. They do not have good air circulation. Walls of worship tend to be painted a dark color and the condition of the floor is not clear because it is closed using a carpet.

Table 1.2. School Support Room

NO	Field of Observation	Condition
1	Cleaning tools	10
2	Rest room	7
3	UKS	7
4	canteen	7
5	School Yard	6
6	Water resources and sanitation	10
7	Waste management	10

Score scale 1-10

The result of observation analysis directly, in general all schools in the observation of schools yard cleanliness are adequate. In all schools, each classroom keeps floor brooms in the corner, dustpan, duster and wipe for wall. Most of classrooms have no mat. Each class with its own form attached a class picket schedule, which is a handful of children 5-7 children who every day in charge of cleaning the class in turn.

KM / WC observed are generally clean, adequate light and wall of good quality. KM / WC is dry not mossy and paint is not peeling. In general, the air ventilation room is not good. The paint color causes the room to be dark and the floor conditions of some locations are still wet. On the way to the shower KM/WC researchers did not look for the separate KMWC between boys and girls. KM.WC found in general so one, for male students and female students there is no separation. The number of KM / WC has not followed the 1:40 ratio for males and 1:25 for women in all schools visited. All schools provide separate KM / WC for teachers and for students, however there is no separation also for male teachers and female teachers. The condition of KM / WC teachers is generally clean. The room is bright enough not smelly, not slippery not mossy. Soap are available and there is clean water that flows well for KM / WC students and KM / WC teachers at school, KM / WC is available scoop, available brush near the room and mosquito larva was generally not found.

Results observation on UKS room in general, the school already has UKS room, the room has a bed, in accordance with the requirements of having two beds. In the UKS ranks are available by weight scales, and height measuring instruments. All schools keep Snellen Chart, thermometer, student visit book, simple medication list and medicine storage cabinet are available, first aid kit (cotton, verban, plaster, red medicine, wound medicine, oralit, alcohol, and paracetamol, and simple medicines, available closed and wastavel bins with running water) Wastavel found outside UKS room, it works normal, and has a running water.

For the canteen, all of the schools observed has a canteen laid away from temporary garbage dumps. The canteen is far from the bathroom and the school toilet. In general, the canteen has furniture in a clean, usable, and well maintained condition. The canteens in some schools have functioning wastavels and have running water equipped with soap. In every canteen school sells diverse foods, fast food, cooked food, and packaged food.

At SD Kauman Elementary School, SD Dinoyo II, SD Sarangan besides school cafeteria, there are also food vendors outside school. Foods sold by food vendors outside the school are diverse, banana fry, sempol, meatball (pentol), batagor and others. There is no information and

judgment about the hygiene and health of food sold by traders. These sellers do not have a certificate of food health published by BPPom or a food hygiene certificate from the nearest public health clinic.

Supporting equipment in the school cafeteria varies widely, because there are schools that offer canteen as lunch places, there is a canteen as a place to sell food. In a canteen that serves as a dining or dining area, the equipment is prepared in general equipment that supports students for lunch. Her desk has many stools, where many hand washing also means cleaning tool. Places where spoons, drinking cups and the workers that always keeps the canteen clean as a dining room is also available.

Canteens for schools do not function as a dining room. It contains fast food vendors and cooked food. Food is served in a sealed place in a glass shelf opened when food will be consumed. Every food vendor in the canteen sells different foods and drinks. Most of these sellers do not have certificates of consumption worth on the food they sell, either the certificate from BPPom or the certificate from the Puskesmas. Schools have the right to request and demand certificates to all food vendors in the school cafeteria to protect students' health. Schools do not conduct proper checks and cleanliness of food sold in schools. No food information is sold worthy or not, healthy or not, labeled BPPom and there is no periodic check on whether the food is expired or not expired. There is no information on whether food and beverages sold in the canteen have been tested periodically free of formalin, borax, and harmful chemical dyes. Are foods and beverages packaged using clean packets for food and not using styrofoam. Schools need to ensure food and drink not using harmful additives (additives). During the observation, most officers in the cafeteria are well-dressed and clean, but no one uses aprons and hoods to keep food clean and sterile. In the presentation of the sellers take food not using tools (spoons, clamps, gloves).

The observations on the school's yard and the school environment are generally good. In almost all schools observed by the yard and school environment in well-maintained condition, regularly swept by officers, and at certain times swept by students (SD Dinoyo). For the ideal open space is in Model Tlogowaru Elementary school, open space is very wide, lots of tree shading, still a lot of vacant land for children to move and socialize. School that have other adequate open spaces is SD Dinoto II, the open space located in the middle of the school building complex, flanked by class and middle school classroom planted with perennial trees so impressive shade, cold, not glare and not noisy. In general, the school's yard and neighborhoods in all schools observed have a tree, have open spaces, are not waterlogged, and in some places biopores are

made to minimize standing water, when it rains. Plants are generally diverse, not just one type of plant grown in the yard and school environment.

Table 1.3. water sources

NO		SD Kauman	SD Dinoyo II	SD Percobaan	SD Model Tlogowaru
1	PAM water	✓	✓	✓	
2	Well		✓	✓	✓

Observation at water source used every day, almost all schools use the source of water from the water source (PAM) provided by the government only at SD Model Tlogowaru water source using wells, because urban drinking water network has not reached Tlogowaru area which is the development area of Malang. All of the school's drains in the form of a sealed drainage flow smoothly and hygienically. From the observation, all schools have septic tank, have a lot of water absorption, and all schools have a swan / closet in the form of a swan neck.

Based on the observation on garbage, all schools observed have tips and waste management system. All schools have covered and separate bins. Each class has a class trash can. Garbage from the classroom is collected to the school's garbage dump, before being transported by local yellow troops dumped to TPA Malang area in Supit Urang. In the temporary garbage disposal at school, there is separation between organic waste and non-organic waste as the learning object about waste management for elementary school students.

All of the school did not inform doing preventive maintenance, there were no data on the implementation of preventive care. Schools do not have regular maintenance documents and building maintenance plan documents and school drawing details. Building drawings as build drawings are not available in all schools, budget plan on building maintenance are not included in the school budged plan (RAPBS).

CONCLUSION

Overall all of the elementary school implementers of the Adiwiyata school program did not have preventive maintenance documents, so that the damage rate and data on repair of damaged building components were not recorded, the maintenance plan was completely non-existent. In elementary schools observed during the elementary school operational period, there were no

document of building completeness such as built drawings and building pictures.

In general, the physical condition of school buildings is good, which views from cleanliness of the room, condition of air ventilation, lighting, wall conditions, floor conditions, paint colors and standard room. The library is not good, has not been systematically functioned, finding observed rest room still not ideal. It is necessary to add rest room by taking into account the proportion of boys and the proportion of girls. School's yard are often overlooked, schools do not see that school's yard equipped with trees and crops are important as school lungs and supporting students' health while studying in the school environment. School warehouse less attention, the room is sober, there is no arrangement and organizing goods stored in the school warehouse.

4. Analysis of environmental education content materials at Adiwiyata junior high schools in East Java

by Sugeng Utaya

Ery Tri Djatmika

Haris Anwar Syafrudie

Nyoman Sudana Degeng

The environment education is important in the education taught in Indonesian. That is caused by since 1973 the Ministry of Environment has decided the environment education as the key of success of the Sustainable Environmental Development program in the 21st Century (Purnomo, 1999). Urgency of the environment education in education is based on the premise that development activities always cause environmental problems and need a proper solution urgently. According to Resosoedarmo (2002), the solution of environmental problems is associated with the growing awareness of a problem that can only be generated through the environment education.

The important role of the environment education in the response to environmental issues is based on the premise that the environment education can shape students' positive attitudes and behaviors towards the environment (Ministry of National Human Resources Development Directorate, 1999). That's because the environment education is a model of education that is designed to increase public awareness on environmental issues (Tumisem, 2009). According to the Ministry of National Directorate of Human Resource Development (1999), the environment education aims: (1) Providing insight into the environment education to all stakeholders (internal and external of school) in solving environmental problems, (2) Setting up a human resources professional who has an attitude in accordance with the demands of the development of science and technology and the demands of sustainable development, and (3) Increasing the knowledge, awareness, and skills of early-age population as a reflection of responsible behavior towards the environment

Substantially, the environment education is an important subject, but the position in the national curriculum is not a compulsory subject in schools. In the National Education System Law, the environment education is only served as elective subject in the form of local content. Ministry of Education and Culture's Rule No. 81-A in 2013 stipulates that the environment education is one material that can be used as a local content subject. According to Ministry of

Education and Culture (2013), local content subject includes circumstances/unique conditions of the area that include the natural environment, socio-economic, and socio-cultural. Thus, the environment education local content can be used as means of introducing students to the neighborhood. In a comprehensive local content subject, the environment education serve as a media to introduce students to keep a good environment, develop environmental awareness, and develop the potential of the environment.

The high urgency of the environment education local content with a weak curricular position, should be served as a challenge for the parties who are concerned in the environment education, especially in the development of the environment education in Indonesia. Critical and systematic efforts in formulating environment education teaching materials are needed, in order to study the local content of the environment education can be more effective and meaningful, especially in raising students' awareness towards the environmental sustainability. If these expectations can be achieved, then the effort to reduce the negative impact arising from national development at present and the future can be realized, and it is very helpful in the efforts to achieve environmentally sustainable development. Based on this, the contents of the environment education material are not public, but to be more specific related the students' daily life.

The environment education material should be adjusted to the demands of the curriculum and student needs. The fact indicates that the environment education teachers of junior high schools in East Java still have difficulty in choosing the environment education material in accordance with the provisions of the Ministry of Education and Culture. The problems that teachers often face are in selecting and determining the learning materials or teaching materials appropriate for students, as well as selecting the appropriate source of teaching materials (Roymundussetya, 2012). In fact, as a local content subject, content of the environment education should refer to the provisions Ministry of Education and Culture, which states that the local content is the study materials in the educational unit that contains the content and process of learning about potential and local uniqueness, to form understanding to the learners of the potential of the region where they live. The environment local content contains material of unique environment which is determined by considering the needs of the educational unit learners, in order to establish an understanding of the potential of learners home area (Ministry of Education and Culture, 2013).

Determination of the environment education learning materials should not be done arbitrarily, but has to be done properly through certain stages. According to Roymundussetya (2012), the selection of instructional materials has to satisfy the principles of relevance, consistency, and

adequacy. Selection of learning materials includes the method of determining the material, the depth, scope, sequence of presentation, and treatment of the material. As a consequence, to identify the material of the environment education local content should be done carefully. The environment education materials should be relevant to students' daily life, so that the environment education can be beneficial for the students and the environment. The environment education materials should also be consistent and in depth according to the educational level of junior high school students. This is the substance that the environment education can be implemented in the field locally and significantly by students.

Reality shows that the environment education materials required by learners in each area in East Java are different. For example, students who live in mountainous areas, plains, and beaches have different environmental problems, so the environment education material they need is also different. In connection with it, it is necessary to do research for the selection of the environment education materials that suit the needs of students. This activity is an important step in the development of junior environment education material, so that the environment education is taught in school really fit the needs of students, and bring substantial benefits to the lives of students and environmental sustainability.

METHOD

This research is a descriptive research. Stages of the research includes analysis of requirements and material selection, validation test, and determination of material of the environment education local content. Material needs analysis is done through the study of literature and field observation. The literature study includes review of reference books and documents of government policy in the environmental field. Studying the reference book aims to obtain a theoretical and empirical foundation on environmental issues; while the study of government policy documents in the field of the environment education is performed to obtain legal basis and guidelines for the implementation of the environment education local content predetermined by Ministry of Education and Culture. Field observation aims to identify the material being taught by teachers and the environment education activities that have been carried out by the teacher. The study of literature and field observation produces teaching materials, which are arranged in the form of draft principles of teaching materials of the environment education local content, along with competency standards and competency base.

The next stage is the validation test of the environment education subjects teaching materials by experts of the environmental education and environmental education teacher at school. The environment education expert validation aims to get the truth of matter, and validation by the teacher aims to get the suitability of the material with the condition of the school. The validity of the field is to ensure that the material is really needed and according to the educational level of junior high school students.

Sampling techniques were imposed on schools, teachers of the environment education local content, and experts. The samples of schools and local content teacher were committed intentionally (purposive sampling), with the criteria of adiwiyata junior high school and local content teachers who have competence in the field of the environment education. Data collected consisted of secondary data and primary data. Secondary data are in the form of curriculum, teaching materials, syllabi, lesson plans, and the environment education textbook that have been used by the environment education teachers. Secondary data collection techniques were done by analyzing the documentation, and data were collected in the form of physical and non-physical documents such as shape files. While the school observation aims to identify the implementation and achievements of the field of the environment education. Secondary data were analyzed and used as a foothold in the needs analysis in the determination of subject matter of the environment education. Primary data were collected through interviews with the parties involved in the environment education activities in schools. In addition to interviews, the collection of primary data was also performed using a questionnaire to gather data needs, advice, and opinion of the teacher of environment education local content. Data in the form of notes and entries on the validation process of environment education expert and teacher are used as a complementary information related to the implementation of the environment education learning.

Descriptive analysis techniques were used to analyze the results of a literature review, interviews of teachers, the environment education documents, and the observation of the school, as well as revision of the post-test validation for the purpose of selecting subject matter of the environment education.

RESULTS AND DISCUSSION

Analysis of the needs of the environment education material for junior high school students through the study of literature find points of the environment education materials given to students in junior high education. According to Purwanto (2010), the determination of teaching materials can be done by choosing an existing material. The review of environment education literature found that material that had been given to the junior high school students include a variety of things related to the environment. Study materials cover all components of the environment education i.e. biotic components, abiotic, and cultural, as well as a variety of environmental problems posed (Resosudarmo, 2002). The Cultural has an important role in the character development of youth (Khuriyah, Utaya, and Sapto, 2017). Almusyafiri, Utaya, and Astina proved that local cultural value of Tribe Osing is relevant to be taught in junior high school. The environment education material proposed by Environment Institution in East Java Province (2009) includes humans and the environment, ecosystems, natural resources, environmental pollution, maintaining the cleanliness of the environment, soil and land, forest, water resources, air, energy, rivers, lakes, coastal and marine, ground water, sustainable development, and natural disasters. Judging from the breadth of its content, the material of the environment education is sufficient because it covers a variety of aspects related to the environment and human life.

In implementation, the environment education materials in East Java were given to all classes at junior high school level. In general, the theme which was given to the students of seventh grade, eighth grade, and ninth grade are similar, but the standard of competence, basic competence and indicator were differentiated at each grade level. Determination of the main points of the material on the same theme, with different classes was based on differences in main competence and indicators that reflect differences of the depth and sustainability. The difference of depth of the material is following the stage that the higher grade, the more detailed the content of the material; while the sustainability aspect was shown in the sustainability scenario from low grade to high grade; as an example, the material of Xa were given to the seventh grade, the material of Xb were given to eighth grade, and the material of Xc were given to ninth grade. In this case the material of Xc is a continuation of the material of Xb, and the material of Xb is a continuation of the material of Xa.

The study of policy documents produces points provision of local content subjects. The main policy referenced in this research is Rule of Ministry of Education and Culture Decree No. 81-A

in 2013, on implementation of Local Content, to obtain the results in the form of material points, the basic competence and indicator of the environment education local content subjects for junior high school students and equal. According to Ministry of Education and Culture (2013), the development of local content subject matter is in terms of potential, culture, and the problems that occur in the local area. According to Khuritah, Utaya, and Sapto (2017), exploration of local wisdom need to be developed and integrated in subject teaching material. In addition, the study material should also be adjusted to the level of students which includes the development of knowledge and ways of thinking, emotional, and social students. Based on this, then it is material that is poured in the environment in the junior environment education teaching materials should not be out of the Ministry of Education and Culture's signs.

Analysis of the policy analysis and synchronization with the reference study, acquire the material needs of the the environment education analysis results, which deserves discussion teaching materials designated as local content of the environment education in junior high school. Principles of such materials include theoretical and empirical aspects, in the form of facts and events of environmental phenomena that occur in the community. Accordingly, the main points of the environment education material proposed by Environment Institution East Java, further elaborated in the form of sub-grain material that contains a real phenomenon that occurs in the environment. Analysis of the needs of the subject-matter yield of the subject, which is specified by the presentation of the facts of environmental conditions, existing environmental issues, impact on the environment problems, causes of the emergence of environmental issues, and efforts to combat environmental problems.

The results of the validation test points of material of the environment education local content by experts and school teachers showed that the junior environment education material is adequate. The environment education expert validation plays an important role because it is the guarantee of the truth. Environment education material experts found the subject matter chosen for the development of the environment education teaching materials has met the needs of the environment and the material scope of junior high school students. The scope of material that includes human and environmental, environmental hygiene, environmental pollution (waste, soil, water, air), forests and mangrove forests, renewable energy, climate change, and natural disasters said to have been very adequate, because the reality of the field indicates that the matter of the environmental issue is really going on in the community. Therefore, after the student receives a lesson on the material, they have already expected to gain adequate knowledge and skills of

environment, because students' need of sufficient knowledge of the environment have actually been fulfilled. This argument is based on the substance of the main points of the environment education material complies with the academic requirements.

Validation test of the environment education subject matter occupied by teachers is a very important role. It is due to the validity of the main points of the environment education material by teachers indicates that the material has met the academic and pedagogic requirement. Fulfillment of the academic aspect is based on the premise that every teacher has duties of academic authority, especially in the choice of subject matter that will be given to students; while fulfilling the pedagogic aspect means that the material of the environment education local content is feasible and appropriate to be taught to students. Based on the results of the validation by teachers then there will be no doubt of the principles of material of the environment education local content generated in this study, to be developed into the environment education teaching materials.

The results of the validation test points of the environment education material and analysis of material requirements by the environment education experts and school teachers, the results of the study showed that the reference study and government's policy find the appropriate material. Main material consists of 11 themes, namely Humans and the Environment, Maintaining Environmental Health, pollution of soil/land, water pollution, air pollution, forest management, mangrove forests, energy resources, coastal and marine, and waste management, climate change, and natural disasters, should be developed and taught in the environment education local content. This shows that the selection of the environment education material has fulfilled the requirements. According to Roymundussetya (2012), the selection of teaching materials has to meet the principles and criteria for the selection of material, has been fulfilled in this study. In principle, the material meets the demands and needs of the student and meet the demands of the environment education. Ministry of Education and Culture's policy and the Department of Education in district/city is an institution that houses education in Indonesia. In addition, the environment education material selected also meet the local content's criteria as an urgent problem and are appropriately taught to students.

Although the general principles of the environment education material meets the requirements of academic and pedagogic, as evidenced by the results of the validation, but the environment education as local content has also to meet the needs of student in the local area. The learning what use the subject of local environment support the holistic learning (Fatma, Mahanal, and

Sari, 2017). The contextual learning material is very important to success learning, because the essential learning purpose is on target. Rohmah, Hariyono, and Sudarmiatin (2017) have found that the contextual material can support to reach 93% learning complete.

According to the Directorate of Development (2008), local content is a form of education that is not centralized implementation, and an effort to ensure its relevance of the provision of education in each region is increasing the circumstances and needs of the region concerned. Related to this issue Ministry of Education and Culture (2013) states that education unit can specify one or more types of study materials, including the environment education local content. In relation to this problem, the environment education material given in different areas, such as mountainous areas, inland plains, and the beach is different. The difference needs of the environment education material is shown in Table 1.

Table 1. Teacher Opinions about the environment education Materials Needed

No	Topic	Teachers in Region		
		Coastal	Plain	Mountains
1	Human and Environmental	√	√	√
2	Maintaining Environmental Cleanliness	√	√	√
3	Natural Resources	√	√	√
4	Water Resources	√	√	√
5	Air Pollution	√	√	—
6	Land Resources	√	√	√
7	Energy Resources	√	√	√
8	Forest Resources	—	√	√
9	Mangrove Forest Resources	√	—	—
10	Coastal and Marine	√	—	—
11	Climate Change	√	√	√
11	Natural Disaster	√	√	√

Table 1 shows that of the 12 subjects offered, there are eight important topics for all teachers in the three regions, i.e. the subject of humans and the environment, maintaining the cleanliness of the environment, natural resources, water resources, land resources, energy resources, changes in natural conditions, and natural disasters. Four other subjects are addressed differently by teachers in three areas, those are: (1) the subject of air pollution is deemed necessary by the teachers in the coastal areas and inland plains, and not considered necessary by the teachers in

mountainous areas; (2) the subject of forest resources is considered less urgent by the teachers in the beach areas, but considered important by the teachers in rural and mountainous areas; and (3) the subject of mangrove forest resources and coastal/marine is considered important by the teachers in the beach areas, but considered less important by the teachers in countryside and mountainous areas.

The subject of air pollution need to be taught to students in coastal areas and plains due to the hot air temperature in those areas and generally has evolved into urban areas with dense settlements. The air condition in these areas tends to have been contaminated by the waste gases produced by transportation and industrial activities. Air pollution in coastal and inland plains has already disrupted the lives of residents. Based on these reasons, the teacher saw that the subject of air pollution needs to be taught to students in these areas. It provides the dual advantages, those are contextual learning can be performed well and learning is expected to foster the life skills for students in dealing with environmental issues in their region. In the teachers' opinion, students in mountainous areas are not urged to be taught of air pollution because they don't face the air pollution problem in their daily lives. Generally, the quality of air in the mountainous regions tends to be always clean.

The subject of forest resources is not urged to be given to students in the coastal/beach area because in most cases forest does not exist in this area. Due to the student's daily life is not related to the forest, they less feel the importance of forests for life. If the forest is used as a medium of learning, the contextual learning cannot be implemented in real terms because the teachers do not have field model as a medium of contextual learning for students. Thus, the absence of forests as a sustainer of life and as a medium of learning effects teachers in the beach area consider not to place the subject of forest resources in the major position in the environment education learning in school.

As shown in the Table 1, the teachers also contend that the subject of mangrove forest resources and coastal/marine should be given to junior high school students in coastal areas. This is due to both resources being very close to the students' daily lives. Students need to understand the condition of their neighborhood both include the strengths and weakness. Students need to understand the local environmental conditions because students are also the component of society who needs to be involved in efforts to preserve the condition of the environment. Good understanding about the neighborhood environmental conditions will help students in conserving the environment.

The environment education learning in schools in coastal areas will be effective if use surrounding environment as learning media. The mangrove forests and coast/beach can be used as a living learning media in implementation of the environmental education in coastal areas. The environment education learning by utilizing real media in the field can be effective because the field media can attract and raise the learning motivation of the students. Moreover, the real field phenomenon is associated with their life, so that they can understand environmental conditions very well. Utilization of field media can encourage students to learn life skills which are very useful for life. And also, in the opinion of teachers, studying mangrove forests and coastal / beach for students in coastal areas is more important than students in mountainous areas and inland plains.

Based on these descriptions, the environment education material given to junior high school students has to contain such material as is suitable for their environmental conditions. The environment education learning need not to be taught too wide. Materials of the environment education learning have to consider the needs of students, especially the phenomenon of living environment which is close to the students' daily lives. In this study, the teachers also suggest teaching the environment education learning not too wide, but the material should be shorter, dense, and meaningful. Purwanto (2010) said that identification of the subject matter of the environment education learning is an important step. Therefore, the finding points of the environment education material in this study are recommended to be conceived and developed into teaching materials. Preparation of teaching material points of the environment education follows the rule of organizing learning materials in a logical or chronological order. The purpose is that the subject matter can be attended by students easily. The development of the subject matter into teaching materials should follow the procedure of preparation of teaching materials (Roymundussetya, 2012), so the unnecessary errors will not occur in teaching material.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of research and discussion, it can be concluded that: (1) Analysis of the material needs through the exploration of reference books, considers the field needs, and uses the discussion of experts in arranging the environment education materials as local content subjects; whereas the subject matter of the environment education learning can vary from one region to another, and (2) Test validation of experts and field teachers can produce the subject matter of

the environment education local content according to the needs of the students. Based on these conclusions, there are two recommendations given by the researchers, those are (1) there is a need in deepening of the material content of the environment education on each theme to be compliance with the level of education of junior high school students, and (2) in order to charge its local visible, the content may be different, depending on the environmental conditions in each region.

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Discussion

by Yayoi Kodama

This article is based on collaborative research on the theme of ESD by professors belonging to the Univ. of Kitakyushu and Univ. of Malang. Miyake and Kodama wrote about ESD in Japan and four colleagues of the Univ. of Malang wrote about ESD in Indonesia.

Miyake covers the outline of Japanese society and the cases of the cities of Nagoya city and Kitakyushu about the current state of ESD in universities and companies. Kodama focuses on compulsory education (primary school and junior high school) in formal education in Japan. Especially, Kodama looked at case examples of schools (eco-schools) that made school facilities environmentally friendly and schools that tackle environmental education as a whole (ASPNet). On the other hand, the team at Univ. of Malang considers the current situation by considering the hardware and software aspects of environmental education at schools (elementary school and junior high school) in the East Java province of Indonesia. Haris Anwar Syafrudie is investigating and examining the current state of school facilities in Adiwiyata School in East Java. In addition, Sugeng Utaya and colleagues are examining the contents of environmental education by analyzing the textbooks of junior high schools in East Java.

In terms of formal education in Japan and Indonesia, some comparative study on ESD at the elementary and junior high school level will be possible. The Adiwiyata School program in Indonesia is a program for promoting environmental education which is translated as a green school award system. In order to be certified as an Adiwiyata School, there are four elements of environmentally conscious educational policy, curriculum and participatory educational activities, plus environmentally friendly facilities. In order to become an Adiwiyata School certified by the state, it must clear its standards. In addition to educational content, school environment improvements will also be subject to certification. As Dr. Syafrudie points out, the school facilities in Indonesia are generally good, and the schoolyards are being made greener. However, it is hard to say that the library and the toilets are well maintained. On the other hand, public schools in Japan have a certain standard of school facilities, but as a whole, aging has progressed, and renovation and repair are underway with the concept of "longevity". Among them, about 1,700 schools with consideration for the environment are being developed nationwide. In these schools, school facilities function as teaching methods for energy conservation, resource saving, and symbiosis with nature.

Sugeng Utaya and colleagues analyze the environmental teaching materials of junior high schools used in East Java Province. The teaching materials for environmental education for junior high school students need to include contents materials suitable for the environmental conditions in the area where the school is located. It is not comprehensive and broad learning content but it is necessary to incorporate the contents of the students' needs, especially the phenomenon of the living environment close to the students' daily life. It is based on the idea that familiar learning content is effective for motivating students' environmental learning.

On the other hand, at a Japanese school (elementary school), we examined a case where environmental education is promoted through the UNESCO school, using the environment of familiar areas (school districts) as teaching materials. There, we confirmed that the area and school as a living environment are made into teaching materials. Environmental education is aimed at nurturing people who think and act as "parties" through learning about "familiar environment". And one of the best ways to learn about the environment as ourselves is to use familiar teaching materials. In school education for both Japan and Indonesia, it is an important step for ESD promotion to advance teaching materials of familiar environment.

While the present situation on ESD in Japanese universities and companies was described, the present situation of universities and companies in Indonesia was not covered at this time. It remains a subject for future research.

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Abstract

This article considers the present situation and the practical issues of environmental education for sustainable development in Japan and Indonesia.

Section 1 shows the significance and contents of ESD (Education for Sustainable Development) at both universities and enterprises in Japan. Particularly, at the university level, HESD (Higher Education for Sustainable Development) is a network of universities that has been playing a useful role for information exchange and strengthening relationships. The company Ito-en has promoted ESD to employees and citizens in terms of CSR (Corporate Social Responsibility) and CSV (Creating Shared Value).

Section 2 considers the present situation of ESD in formal education, mainly in elementary and junior high schools in Japan. It describes the approach at schools with environmentally-friendly school facilities and efforts at ASPNet-approved schools that conduct ESD activities, especially ESD practices of elementary schools in Kitakyushu. The research method is text analysis of literature and interview data gathered and consideration of investigation results.

Section 3 describes the preventive maintenance, building conditions, and participants of Adiwiyata School programs in Indonesia. Preventive maintenance is a conscious form of action to keep primary school tools and facilities always in a ready-made state. Preventive maintenance can also be interpreted as an act to make repairs so that the conditions of tools and facilities can function optimally. The objective of this research is to record preventive maintenance activities and collect data about the conditions of primary school building facilities by directly observing some schools. From the data it was found that all the primary schools in the observation generally have good school building conditions, but little attention is paid to the lighting and conditions of the classrooms, libraries, and warehouses. Schools do not have preventive maintenance documents, so the damage data on damaged building components is not recorded. In primary schools observed during the primary school operational period, no documents of building completeness such as drawings and building design plan images were found.

Section 4 discusses the contents of some of the environmental education material at some Adiwiyata junior high schools in East Java. Most of the districts in East Java province have established subjects on environmental education as local content in junior high schools. The aim of the program is for junior high school students to gain knowledge, skills, and positive attitudes concerning the environment. Until recently, teachers have not had the ability to choose the most suitable materials for their students. This study aims to find teaching materials for junior high schools with environmental education content which is in accordance with the school environment and local area. The research was conducted by phases: (1) identification of the environmental education material including

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literature review, observation of the school, and the analysis of material needs, and (2) validation test of the environmental education experts and school teachers. The data was the main subject matter of the environmental education content under the terms of the Ministry of Education and Culture's Rule No: 81-A of 2013 about local content. Validation tests of the environmental education experts and school teachers includes review, revision, and confirmation. The data was analyzed descriptively. The focus of the research is environmental education content particular to the East Java region which differs from schools in coastal areas, inland plains, and mountainous areas. It is useful to differentiate content according to region. For example, the conservation of mangrove forests material is suitable for junior high school students in coastal areas, forest conservation material for students in the upstream region (mountains), and agricultural waste pollution material for students in the interior plains. It is logical that environmental problems that occur in the three regions are different.

In the last section, we detail a comparative study of environmental education in Indonesia and Japan.