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RESEARCH ARTICLE

EVALUATION OF ENVIRONMENT-FRIENDLY SCHOOL PROGRAM BASED ON ADIWIYATA AT SENIOR HIGH SCHOOL IN DUMAI CITY-INDONESIA

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ABSTRACT

Environmental education has recommended by UNESCO four decades ago. Indonesian Government through Ministry for Environment Affairs and Ministry of National Education initiated an environmental education program as co-work program, called as Adiwiyata, for elementary and second education level school. Although, this program has ran for more ten years, it was found that many school facing problem in adopting curriculum and program. In Dumai city-Indonesia, State Senior High School (SMAN) 2 Dumai is projected to reach Adiwiyata School in national level, now the school remaining as Adiwiyata School in city level. As upgrading efforts to higher level, an assessment of the school preparation, program and progress to achieve national level is needed. This research give an evaluation of Adiwiyata program progress which adopted by SMAN 2 Dumai. We use qualitative and quantitative approachment in collecting all data through interviewing stakeholders, questionnaire, focus discussion group (FDG) and direct observation to evaluate environment-friendly behavior and program inside the school. Over all, the school has been conducted many efforts to fully adopt Adiwiyata program.

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INTRODUCTION

Dumai City is the busiest petroleum industry and international port on the east coast of Sumatera (Amin *et al.*, 2009). The problem of environmental pollution is close with this city. Pollution of oil spill from oil palm and petroleum in Dumai coastal are national issue few years ago (Amin *et al.*, 2009; Thariqa and Sitanggang, 2015). Coastal reclamation for port expansion and urban residence are also a crucial problem that has a direct impact on the environment of the city of Dumai. School is formal institution to develop character and human behavior through various programs that can involve school citizens, especially students (Mahato, 2018). Environmental education in the school is the best way to instill environment-friendly knowledge and behavior for the students. This education is greatly important to develop human generation who strongly care and understand about today environmental conditions which globally are experiencing a drastic change towards destruction (Monroe *et al.*, 2000). The signs of this environmental damage are indicated by the rising of global temperature, climate changes, forest destruction, and pollution of water territory. Of course, this knowledge really helps students to do everything for saving our living environment in the future. Following UNESCO recommendation four decade ago (Sauvé *et al.*, 2007), Indonesian Government trough collaboration between the Ministry of National Education and the Ministry of Environment of Republic of Indonesia has launched a program that aims to instill character the society for

caring and comprehending environmental problem known as "Adiwiyata" Program. Adiwiyata program is proposed to realize school member responsibility as efforts for environmental protection and management through good school governance to support sustainable development goals (SDG's) (TATN, 2011). In the reality, base on annual assessment of Adiwiyata teams, it was still found that the school had many problems in implementing this programs. There are tendencies that the policy has been made by the government cannot be realized properly. The integrated programs of the learning process in intracurricular and extracurricular ways are still limited to the level of knowledge and understanding, it is no capable to change the attitudes and behaviors of school citizens to concern about the environment in their daily life. So, participatory environment-friendly activities have not been followed by all school members. Moreover, environmentally friendly infrastructure is still far from the expectations and objectives of the Adiwiyata program. SMAN 2 Dumai, located in Dumai City-Indonesia, is a senior high school prepared to take part in the Adiwiyata program for national level. This study is intended to assess the preparation of SMAN 2 Dumai in running the Adiwiyata instrument and program guide. In creating an eco-friendly school, must involve all school citizens. A planning in environmental management and preservation can be included in all school activities. The assessed aspects in this study includes the availability of school infrastructure, vision and mission of school and management resources. The assessment

was carried out through a series of direct observations, interviews, questionnaires and focus discussion groups (FDG) to develop a guideline for implementing the Adiwiyata program at SMAN 2 Dumai. This research report is expected to be taken into consideration for other schools in Dumai city to prepare Adiwiyata school programs. SMAN 2 Dumai is the example for this assessment because the school has large number of students that is 904 students. Senior high schools in Dumai City have relatively similar in characteristics. So, we consider this school very feasible to be used as an assessment sample in the city of Dumai because the school is one of the oldest senior high school and has large population.

MATERIALS AND METHODS

Research Approach

This research us qualitative and quantitative approach with randomly sampling (Anselm and Juliet, 1998). The qualitative approach in this study is used to describe the planning and implementation of school programs in environmental management based on Adiwiyata program. The quantitative approach is used to measure the level of achievement of the management of environmental-friendly school based on the Adiwiyata program. The researcher observes the environment and the behavior of school citizens with various symptoms that occur naturally at school. We also provides all materials and instruments to collect data by interviews, questionnaires, and focus group discussion (FGD).

Location, Time and Object of Research

The study take place at SMAN 2 Dumai in Dumai City. The school have been participated in the Adiwiyata Program currently in provincial level. Time of observation was carried out from 2016 to 2017. The objects in the study were school citizens which included the principal, the educators, education staff, students, cleaning staff, and canteen managers. Sampling process is conducted randomly by simple random sample. The sample of 200 students are representative of each class level, namely class of X, XI, and XII. The sample of teachers are 44 staff. The number of samples is according to Arikunto (2006), should following wise choices. If the subject is less than a hundred, it must include all population. However, if the subject is large, it can be taken between 10-15% or 15-25% or more. The total population in SMAN 2 is 1006 citizens. So, we take about 24 % of the school citizens for questionnaire.

Data Collection Method

Data collection techniques were carried out by interview, questionnaire, observation, and documentation methods, as well as FGD for manual validation. Interviews and questionnaires were conducted randomly to the school members to find out the policies, planning and implementation of school programs related to environmental management and the fulfillment of infrastructure facilities in supporting of learning activities and environmentally friendly facilities. Data collection through interviews was obtained from the principal, deputy head of the school (Adiwiyata team coordinator), staff of the Department of Education and the Environment Office of Dumai City. Interviewing stakeholders in both of these agencies are to obtain information on the number of schools participating in the Adiwiyata Program and the role of the two agencies in realizing environmentally sound schools. Datum in

the form of questionnaires are given to educators (teachers) and students in each class. Observations were made to observe the environment, facilities and behavior of school citizens using Adipura (other eco-friendly program for city awards) and Adiwiyata assessment criteria.

Variables and Research Instruments

Research variables include: a) school policies in the form of planning and implementation of Adiwiyata program in the school in environmental protection and management, b) school programs on environmental protection and management of activities, facilities and infrastructure, and funding for environmental protection, such as slogans and appeals to care for the environment, c) cooperation and support from the government, school committee, and social institutions, d) monitoring and evaluating environment-friendly schools. The research instruments were in the form of interviews, questionnaires, observations, and documentation regarding school policies and programs carried out by the school members as well as the infrastructure owned by the school. FDG was conducted to validate a manual book. Interview and questionnaires were validated by appropriate supervisors and colleagues.

Data Analysis

To analyze the data we applied qualitative and quantitative analysis with a statistical approach in the form of a percentage. The results of observations in the field, interviews with principals and deputy principals, and documentation obtained in the form, programs, and photographs are described according to the research objectives. Questionnaire statement are arranged based on Likert scale, a method of scaling attitude statements that uses response distribution as the basis for determining the scale value. The category of questionnaire results is divided into three categories, namely: good (a combination of answers always and often), sufficient (occasional answer), and less (rarely and never answer). The other data exclude the questionnaire also has three categories of outcomes, namely good if $\geq 80\%$; sufficient if 79% - 60%; and less <60% (adopted from Adiwiyata criteria).

RESULTS

Profile of SMAN 2 Dumai

SMAN 2 Dumai was established on January 10, 1979 with NPSP (school ID number) 10404314, having a land area of 20,840 m². The school is located on Putri Tujuh Street, village of Teluk Binjai in Dumai Timur District. Currently, the school is led by Drs. Sukaini as the headmaster with total school members of 1006 people, consisting of students, educators, education staff and non-education staff as shown in Table 1. As one of the oldest senior high school in Dumai City, SMAN 2 Dumai is the leader of school cluster of the Curriculum 2013. Based on school documents, SMAN 2 has policies and programs that support government activities. One of them is Adiwiyata Program, which aims to create caring students for Environmental Management and Protection (EMP). The school's commitment to environmental care is reflected in the formulation of the School's Vision and Mission. The vision school, that is "To be a favorite school based on character, excelling in science and technology, humble and religious, environmental-friendly manner, child friendly, gender

responsive, Malay culture and capable to compete in the global era". According to the deputy headmaster for facility affairs, SMAN 2 Dumai in developing schools towards Adiwiyata school is continuously provide the supporting facilities for environmentally friendly activities and learning activities for the management and preservation of the environment according to the criteria of the Adiwiyata school. All compiled and agreed formulations can be implemented properly. It is necessary to plan the target and the programs according to school conditions. Strategic planning is the foundation for schools to run the education process. Components in strategic planning include the vision, mission and goals of the school. School vision is a moral imagination that describes the desired school profile in the future. This is in accordance with the opinion of Caman and Qurniati (2016), so that school management can run well, a strategic plan is needed as efforts to control the organization effectively and efficiently.

School Management for Adiwiyata Program

SMAN 2 Dumai was firstly recorded as Adiwiyata program participant school in 2013 (KLH Dumai City, 2016). Since that time, the school has tried to carry out environmental management and preservation activities by fulfilling the infrastructure facilities included in the school program planning and the School Budget Work Plan (SBWP). Based on the results of interviews, the school have formally designed Adiwiyata team by issuing the Principal's Decree. The member and general job description of the Adiwiyata team is given in Table 2. SMAN 2 Dumai has four vice principals, whom is in charge of student affairs, curriculum affairs, facility affairs and public relation affairs. Deputy headmaster of student affairs and facility affairs are the main drivers in compiling environmental education activities. Based on the results of interviews with principals and deputy principals, planning for environmentally friendly education is work programs of deputy principals for student affairs and facility affairs. The student affairs office has been organize program and agenda to support environmental education as seen in Table 3. Based on Table 3, it can be seen that the student affairs program at SMAN 2 is on track towards environmental care activities, such as skills development and entrepreneurship, fostering the life of the nation and state, as well as physical fitness and creative power.

The student field focuses on the involvement of school members in the management and preservation of the environment, such as producing written works and works related to the environment. Program planning in the facility affairs focuses on simulation activities for students and other school members as well as competition among the classes, as depicted in Table 4. Information from the headmaster deputy of facility affairs, simulation activities have been started at the beginning of 2016/2017 school year. Simulations are carried out by the facility affair office in collaboration with scout coaches. This program is a routine activity integrating in intracurricular and extracurricular learning, such as waste sorting activities, planting hydroponic plants and composting. The purpose of this activity is to shape the human character of culture and care for the environment. According to Mulyana (2009) changing human behavior to care about natural resources is a top priority in overcoming the environmental crisis. Similar opinion expressed by Desfandi (2015) that to build a community with a caring character, the best way is

through education. This opportunity is utilized by the schools to make the school community character care for the environment. Program planning is prepared and implemented by all school members. According to the deputy headmaster of student affairs, environmental management and preservation activities can be carried out by conducting real activities in the environment, holding training and coaching, as well as competitions. The timing of the activity is divided into three, namely daily, weekly and tentative activities. The timing of the activities can be found in Table 5. The daily activities are activities of students in cleaning classrooms every day, known as class pickets. Class pickets are conducted by all classes and involved all students in each class to take turns every week. Weekly activities are activities that take place in turns every Saturday, namely cleaning pickets and clean Saturday activities carried out in mutual cooperation. Clean Saturday is determined by the location and schedule. Tentative activities are activities carried out at certain times, such as commemorating religious and national holidays. The implementation is carried out in the school environment or outside the school environment. The activities include competition from students. Program plannings in the deputy headmaster of student affairs and the facility affairs are complementary each other. Both of these program makers are expected to be able to make school citizens love and care for the environment.

Table 1. The cintizens of SMAN 2 Dumai

School citizens	Men	Women	Sum
Teachers	20	64	84
School Administrators	4	7	11
Janitors and Security Guards	6	1	7
Students	342	562	904
In total	372	634	1006

Source: Profile of SMAN 2 Dumai in 2016

Table 2. Members of Adiwiyata Team of SMAN 2 Dumai

No	Stakeholders	Number	Responsibility
1	Headmaster	1	Fostering the team
2	Diputy of Headmaster	4	Program coordinator
3	Administration staff	2	Administration works
4	School committee	1	Financial support
5	Teachers	40	The doer and program successor
6	Students	46	Student representative and program successor
7	Janitors	3	Helper
	Sum	97	

Source: Secondary data, 2017

According to the results of Landriany (2014), in order to realize a green school, school citizens need to be involved in various environmental learning activities. Consistent opinion also expressed by Faniran and Orimoogunje (2016). They said that humans are responsible for the environment should not be motivated or blamed by an ecological crisis, but should be connected with their relationship with God and the environment itself. The environmental management program at SMAN 2 has involved school members, especially students and educators in various environmental activities.

DISCUSSION

Overview of Adiwiyata Program: Adiwiyata comes from two Sanskrit words, namely "Adi" meaning big, good, great, ideal, perfect, and "Wiyata", a place where someone gets knowledge, norms and ethics in social life. So Adiwiyata is a good and ideal place where all knowledge and various norms and ethics can be obtained to develop human basic knowledge

Tabel 3. Enviroment-Friendly Program for Student at SMAN 2 Dumai

No	Program	Agenda	Activities	Outcome
1.	Coaching skills and entre-preneurship	a. Improving the skills of creating a creative and valuable products b. Increasing businesses in discipline of engineering and screen printing c. Developing student's skills for artistic crafting and cooking	Reusing dan recycling waste for making new valuable and creative products Conducting workshops and practices in discipline of engineering, electronics, agriculture, livestock, etc	- Improving creative skills of the students and spending time wisely for productive activities - Improving student's skills in processing and working in field of agricultural engineering and carpentry
2.	Fostering national cultures and values	a.Organizing a writing competition	b.Organizing a writing competition about environmental issues	Growing a sense of love for the environment and being responsible for preservation of the nature
3.	Physical fitness and creative potency	Healthy living awareness in the school environment	Social service and cleanliness	- Developing a learning environments and conditions more clean, healthy and comfortable
	a. School health center	Health education, health services. Fostering the school environment	Improving physical and mental and health knowledge to live healthy	
	b. Maintaining school greenery and cleanliness	-Cleaning pickets -Class pickets -Mutual cooperation / Saturday cleaning -Competition for cleanliness and magnificence of class -Greening school environments	The environment in the school is clean, healthy and beautiful	- In order to students can add and enhance their science knowledges
	c. Prevention of narcotics abuse, drugs, liquor and smoking	Bring in appropriate speakers for the problem	Students have the lifespan and understanding bad effects of narcotics, drugs, alcoholic beverages and smoking	- Improving knowledges and skills

Source: Secondary data, 2017

Tabel 4. Work Plan Program of the Deputy Headmaster of Facility Affairs

NO	Activities	Time (in local time zone)	Note
1	Waste management : sorting of organic and inorganic waste	08.00 - 08.15	simulation of waste sorting after the ceremony
2	Hydroponic class	15.10 - 16.10	simulation of hydroponic manufacturing during scout hours
3	Making compost	15.10 - 16.10	simulation of composting during scout hours
4	Making slogans / posters with environmental themes	tentative	posters are placed in strategic places such as in toilets, class rooms and outdoors
5	Organizing competition of: -Environmental cleanliness and class completeness - Hydroponic / Making compost	bimonthly	competition among classes
		bimonthly	competition among classes

Source: Secondary data, 2017

Tabel 5. Schedule Time of Eco-Friendly Activities

No	Agenda	Time Cycle	Additional note
1	Class pickets	Monday-Saturday	All classes and regularly
2	Cleaning pickets	Every saturday	Together with Mutual cooperation / Saturday Cleaning
3	Mutual cooperation / Saturday Cleaning	Every saturday	Regularly, on the schedule
4	Social service and cleanliness day	On Religious Day and Classmeeting	Inside and outside the school
5	Writing competition on environmental sustainability	On National Holidays and School Anniversary	Class representative
6	Reusing dan recycling waste for making new valuable and creative products	On National Holidays and School Anniversary	Class representative
7	Competition for cleanliness and magnificence of class	On National Holidays and School Anniversary	All classes
8	Greening school environments	Every new calendar year	Activities for Introduction to School Environment (IES)

Source: Secondary data, 2017

on environmental management towards better sustainable development. The aim of Adiwiyata program is to realize school citizens who are responsible for environmental protection and management efforts through good school governance for sustainable development. By implementing Adiwiyata program, it will create school citizens, especially students, whom care with environmental issue. At the same Time, it will supporting and realizing human resources with national character who care about their economic, social and environmental development in achieving sustainable development. This program has four components that must be carried out by a school, namely, 1) environmentally sound policies; 2) implementation of an environment-based curriculum;

3) participatory based environmental activities; and 4) management of supporting facilities (TATN, 2011). In addition to the four components above, the school in implementing the Adiwiyata program must be based on two principles. First principle is participatory, that is by involving the school community in managing school activities base on their respective responsibilities and roles. Second, following principle of sustainability. That is all school activities should be carried out under a plan and continuous works comprehensively (TATN, 2011). Both of these principles shown that the involvement of school members to support caring and eco-friendly programs is very influential on school governance both in terms of management and in terms of the

character possessed by school citizens. Adiwiyata program has been implemented since 2006 at the level of primary and secondary education, but nationally schools achievement in Adiwiyata are still very low. This can be seen from the data on the number of Adiwiyata schools from 2006 to 2011, that are only 95 elementary schools from 178,435 schools (0.05%), 82 junior high school (SMP) from 50,760 schools (0.16%), 77 senior high school (SMA) from 11,778 schools (0.65%), and (SMK) 18 out of 9. 164 (0.20%) from all over Indonesia (TATN, 2011). Totally, number of Adiwiyata are 272 schools. Overall, the schools need more guidance and assistance to promote they level concerns about environmental education. So that the objectives of Adiwiyata program can be realized and become the character of school people in their daily lives.

Achievement and Progress

The achievement of Adiwiyata school programs in SMAN 2 can be described as follows

- Formulation of the school's vision, mission and aims have fulfilled three efforts to manage and preserve the environment, namely: environmental-friendly policies, participatory-based environmental activities, and management of eco-friendly supporting facilities with 100% achievement.
- Financial allocation o for management and environmental preservation is intended only for four activities out of seven existing activities, with achievement of 57.14%. The four activities include: student activities, curriculum and learning, facilities and infrastructure, as well as the culture and environment of the school. What is not allocated are activities to increase the capacity of educators and education personnel, the role of the community and partnerships, and the improvement and development of quality.
- The achievement of school participation for maintenance and care school buildings and school environment is in well category, participation of teachers of 88.64% and students of 92.38%. School citizen participation in activities to utilize land and school facilities is generally quite good, teacher participation is 70.46% and students are 71.90%. The involvement of citizens in extracurricular activities is in the good category, namely 90.90% for teachers and 86.19% for students. Based on Adiwiyata criteria, the involvement of school residents should be $\geq 80\%$. Participation of school members for environmental action activities by outside parties, the school only participated in two of six ($2/6 \times 100\% = 33.33\%$). Thus it is still in the less category.
- Partnerships with outside parties which do with student parents and the government. Based on Adiwiyata criteria, it is expected that schools will receive support from three related groups. The school also get assistance from two partnerships ($2/3 \times 100\% = 66.66\%$), which means that it is in the sufficient category.
- The availability of environmentally friendly supporting facilities at SMAN 2 is in a good category, because it has six of the seven required ($6/7 \times 100\% = 85.71\%$), which is not yet a composting tool.
- The availability of facilities for supporting the learning activities at SMAN 2 is still in less category ($2/10 \times 100\% = 20\%$), because the school only has 2 of 10

required facilities. These unavailable facilities are composting, water utilization and processing, school forests, gardens schools, green houses, fish ponds, biopore infiltration holes, and infiltration wells.

- Achievement of improving the quality of management and utilization of environmentally friendly infrastructure has met the criteria of the Adiwiyata School. However, there are still shortages of facilities, namely sinking classrooms, canteens and dispensers in class. Canteen food testing by drug and food control agencies and waste bank activities have not been carried out.

Conclusion

Environmental education is main key to develop basic knowledge of the society on environmental management towards better sustainable development. As formal institution, SMAN 2 Dumai has been held environmental education by adopting Adiwiyata program, an eco-friendly program for primary and secondary schools in Indonesia. The school has Adiwiyata team which includes participation of all school members. There are two main contributing in succeeding Adiwiyata program at SMAN 2 Dumai that is students and facilities sector. The supporting programs and student activities for strengthening eco-friendly culture at the school have planned well. The level of citizen participation in several aspects of management and environmental activities is categorized as good, but the school contribution for taking part of outside environmental action is less. Moreover, all required facilities for supporting environment-friendly school, are almost fulfilled completely. Only composting devices was not available in the school.

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