Hindawi

Research Article
Adiwiyata Program Innovation through Penta Helix Approach

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The Adiwiyata program is a government program implemented in 2006 due to Indonesia's declining environmental quality. As a part community, students need to be educated about caring for the environment that can be grown through education. Much research has been described on the Adiwiyata program, but information about the role of Adiwiyata in developing the character of caring for the environment is still limited. This study aims to create the innovation of the Adiwiyata program in developing environmental care characters in elementary schools in Surabaya through the Penta Helix method. The research is located in some elementary schools in Surabaya city, and this study uses a qualitative case study approach. The output of this research is to redesign the Adiwiyata program in the city of Surabaya through the Penta Helix approach. This research method uses qualitative methods. Data are collected through literature studies, semistructured interviews, and surveys and used qualitative data analysis. The results show that the policy's content and the context of implementing the Adiwiyata program had been going well. Further suggestions researchers suggest continuing to improve the performance of this Adiwiyata properly and providing a reward and punishment system to the implementers involved.

1. Introduction

The increase in global temperature, sea level rise, ocean acidification, and other impacts of climate change are seriously affecting life on earth (United Nations, https://sdgs.un.org/2030agenda). Therefore, to sustain the condition of the environment, all human activities should be in accord with the concept of sustainable development [1]. Sustainable development is the overarching paradigm of the United Nations (UN). The 1987 Brundtland Commission Report described sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [2].

To realize the sustainable development paradigm, the UN has set the eight Millennium Development Goals (MDGs), which were implemented from 2000 to 2015. The eight MDGs are (1) eradicating extreme poverty and hunger; (2) achieving universal primary education; (3) promoting gender equality and empowering women; (4) reducing child

mortality; (5) improving maternal health; (6) combating HIV/AIDS, malaria, and other diseases; (7) ensuring environmental sustainability; and (8) developing a global partnership for development [3–6].

One of the purposes of sustainable development is to implement a sustainable environment, and technically, it can be done through a global partnership. Moreover, the UN, through UNESCO, also developed education for sustainable development (ESD), which was implemented from 2005 until 2014. ESD consisted of five principal activities, namely: (1) advancing policy (reorienting curriculum to address sustainability); (2) transforming learning environments; (3) building capacities of educators; (4) empowering and mobilizing youth; and (5) accelerating local-level actions [2, 7–9].

It will implement Sustainable Development Goals (SDGs) from 2016 to 2030 [10]; of the four ESD activities, one form of ESD is undertaken by establishing green schools. One kind of ESD is implemented by building green schools out of the four ESD activities. In Indonesia, following the

mandate of the Constitution of the Republic of Indonesia of 1945, Article 28h stated that a healthy and suitable living environment is a fundamental right of every citizen of Indonesia [11]. As a result, attempts to meet the mandate are outlined in Law Number 32 of 2009 on Environmental Protection and Management [12, 13].

On June 3, 2005, the Ministers of Environment and National Education signed a contract to promote ecological awareness and understanding among students and the community, indicating the scope of the agreement. The realization of the deal, on February 21, 2006, has been proclaimed the *Adiwiyata* program to achieve the school community who are aware of the environmentally based culture [13]. As a result, via the *Adiwiyata* initiative, the Ministry of Environment and the Ministry of Education of the Republic of Indonesia selected environmental education. For this reason, it is necessary to evaluate the implementation of the *Adiwiyata* program in Indonesia [9, 14–16].

The existence of the *Adiwiyata* school program in Indonesia as a medium to develop a caring character for the environment is essential, and the *Adiwiyata* school that has been created must continue to be improved. It must be improved if it is related to the schools implementing this program. In 2017, the *Adiwiyata* program covered 4%, of about 8,331 schools. In 2018, 875 schools wanted to act in this program and 314 were excluded. [17]. In addition, the integration of the character education-based curriculum must continue to be pursued to synergize with the *Adiwiyata* program. The *Adiwiyata* program is necessary for every school to create a prosperous life not just a slogan or a program on paper, so every school should support and strive to achieve the *Adiwiyata* title [9, 18–20].

Growing an environmentally conscious attitude, as defined by the Ministry of Environment and Forestry, necessitates the involvement of multiple parties, including those at the ministry level. When this policy is implemented, the role of various sectors is needed, such as the Ministry of Environment and Forestry, the Ministry of Education and Culture, the Ministry of Religion, the Ministry of Home Affairs, and the Ministry of Research, Technology, and Higher Education. Collaboration from multiple parties is essential for the successful implementation of *Adiwiyata* school. This program involves not only the school but also education units, students, committees, parents, community, media, and private support [9].

Surabaya is considered a prosperous city in caring for the environment. It is proven by the various awards that have been won in overcoming environmental problems [21–24]. This success is inseparable from the participation of the community and the Surabaya city government through the Environmental Service (DLH) in the success of the *Adiwiyata* program since 2007. From 2007 until now, there have been 288 *Adiwiyata* schools in Surabaya, consisting of 20 *Adiwiyata* Mandiri schools, 22 National *Adiwiyata* schools, 24 provincial *Adiwiyata* schools, and 222 Surabaya city *Adiwiyata* schools.

The Surabaya Environment Service has encouraged many schools in Surabaya to compete to win the *Adiwiyata*

award by creating the *Adiwiyata* school program [9, 25]. The Ministry of Environment and Forestry (KLHK) awarded the 2019 National Adiwiyata and Adiwiyata Mandiri awards to 434 schools throughout Indonesia. This school consists of 376 public schools and 58 private schools from 164 cities or districts in 32 provinces. Of the hundreds of schools, 13 schools in the city of Surabaya won the *Adiwiyata* award where 11 schools won the National Adiwiyata and 2 schools won the Mandiri Adiwiyata.

However, at the same time, the city of Surabaya is also an area prone to flooding and other environmental problems. Based on a report from the Surabaya Cleanliness and Green Open Space Service (DKRTH) in dealing with floods, officers from DKRTH conducted a garbage sweep. They found ten dump trucks of garbage swamping rivers in Surabaya [26, 27]. Moreover, Surabaya river is one of the lower tributaries of Brantas, which is included in the top 20 plastic-polluted rivers worldwide [28]. According to Suwari et al. [29], about 32.5% of the population in these cities, who live at a distance of 500 m from the river, dispose of their domestic waste into the river. In addition, Surabaya city generated 2,790.89 tons per day of solid waste, of which 19.44% was plastic [17, 30, 31].

Environmental knowledge is highly correlated with environmental activities [32, 33]. In addition, environmental knowledge is associated with an increase in citizens' attitudes toward the environment [7, 34–37]. The educational environment can support environmental action and raise awareness, concern, and acknowledgment of the impact of community activities [38–40]. Problems related to the amount of waste in the Surabaya river are further interesting to find out how the implementation of *Adiwiyata* school in Surabaya elementary school, which does this program have implications for and contribution to the development of character education attitudes, values, morals, character, and personality. Some studies in some countries show knowledge regarding the environment does not significantly correlate with attitude development [41–43].

This research is directed to see the formation of environmental care character from an early age through the *Adiwiyata* school program. It also needs support and innovative studies to support its sustainability so that researchers are interested in researching more deeply. This collaborative research is expected to have optimal synergy to improve the quality of research and publications. This study will focus on the innovation model of the *Adiwiyata* program implementation, and researchers will use analysis on aspects of policy content and context of performance [9, 44–46], as well as highlighting the stakeholders' roles through a Penta Helix approach [47]. The research output is to design the existing model and the recommendation model for implementing the *Adiwiyata* program in Surabaya.

The problem formulation in this research is how to analyze the *Adiwiyata* program innovation in terms of policy content and implementation context and the stakeholders' role through the Penta Helix approach [47], and will design the existing and recommendation models for the *Adiwiyata* program implementation in Surabaya.

2. Method

2.1. Types of Research. Previous research only examined the *Adiwiyata* program as an effort to develop the character of caring for the environment and how it relates to the implementation process. Meanwhile, this study examines the importance of the Penta Helix concept in supporting the *Adiwiyata* program in the city of Surabaya. This research was conducted at the junior high school level by involving participants from the implementers of the *Adiwiyata* program, namely teachers and education staff, students, and a structured team to implement *Adiwiyata* school, parents through the school committee, as well as the community and the private sector to examine all possible involvement in this program. In addition, interviews were conducted with the City Education and Culture Office, City Environment Service, academics, the press, and entrepreneurs who provided CSR, as well as school principals and teachers from seven public junior high schools that implemented the *Adiwiyata* green school program. All informants and participants provided informed consent forms to them.

2.2. Data Collection. In the first stage, the researcher conducted a literature study based on several works that discussed environmental education programs and proenvironmental characters from selected national and international articles. The data were collected and analyzed to strengthen the urgency of this research, and the practice of collaboration between schools and various parties became a research focus. We focus on program innovation from the education unit and city government as an indicator of the success of seeing the Penta Helix approach in this program. The second stage collects data through observation, interviews, and FGD. Statements were made by visiting schools and being involved in several *Adiwiyata* activities in schools, such as the activities of students making compost and recycling waste. Interviews were conducted unstructured on students at the research site on the sidelines of the *Adiwiyata* program activities using everyday language that remained following the interview guidelines that had been formulated. The FGD was conducted in one of the schools; those who attended and participated in the FGD were representatives of the City Education and Culture Office, which handled the *Adiwiyata* program, representatives of the City Environment Service, which dealt with the *Adiwiyata* program, academics, the press, and entrepreneurs who had provided CSR. The FGD moderator is the lead researcher and one of the research members is the note-taker. The FGD was conducted in conducive and relaxed conditions; Indonesian was used. In the third stage, the researcher analyzes the data, which captures the essence of the research objectives and reduces the data that have been classified based on relevance and need. In the fourth stage, the researcher reanalyzed the collected data as raw data that needed to be identified with each other. The fourth stage is data validation, and the fifth stage is concluding.

2.3. Data Analysis. All the data obtained were analyzed using a general qualitative approach inductively. Inductive coding begins with a careful reading of the text and consideration of the various meanings inherent in the text. The evaluator then identifies the text segment that contains the meaningful unit and creates a label for the new category assigned to that text segment. Additional text segments are added to the relevant category. At some stage, the evaluator may develop an initial description of the meaning of a category and write memos about the category (e.g., associations, links, and implications). Categories can also be linked to other categories in various relationships, such as networks, category hierarchies, or causal sequences.

3. Result

The realization of ecological approaches is carried out through *Adiwiyata* program. The *Adiwiyata* program in Surabaya city has developed four criteria, namely, environmentally friendly policies, implementation of an environmentally based curriculum, participatory-based environmental activities, and management of ecologically friendly supporting facilities. The *Adiwiyata* program is implemented based on the curriculum and the basic learning plan (RPP), where the curriculum and RPP contain an environmental curriculum.

The implementation of the environment-based curriculum is based on six aspects of environmentally friendly behavior. These aspects are the drainage system, environmental hygiene, sanitation, waste management, plant maintenance, water conservation, energy conservation, and other environmentally friendly behaviors. Participatory-based environmental activities in elementary schools aim to encourage the creation of knowledge and awareness of school residents in ecological conservation efforts. In this program, it is hoped that every school member will be involved in activities toward a healthy environment and avoid adverse environmental impacts.

For example, through infrastructure, schools create a waste bank program where teachers can give their students an idea about the stages in waste management and explain the impact of waste accumulation if it is not processed, it will harm the environment. With this education, students must be aware of a caring and environmentally friendly culture. The management of supporting facilities in elementary schools is carried out by involving all kinds of elements of the school community or even by forming a unit responsible for implementing the *Adiwiyata* program.

The theory used as a knife analysis in this study uses the policy implementation theory advanced by Merilee S. Grindle, which covers the question of the content and the context of the policy. According to Merilee S. Grindle, policy implementation theory is influenced by two significant variables, namely, the content of the policy or content and the implementation environment or context. The Merilee S. Grindle model proposes the implementation theory as a political and administrative process. The model describes the decision-making process by various actors, where the final output is determined by both the program material achieved and through decision-makers' interaction in the administrative and political context. The political process can be seen through the decision-making process involving various policy actors, while the administrative process can be seen through the general process [4].

The contents of the policy, according to Grindle, include (1) the interests that are affected by the policy; (2) the types of benefits that will be generated; (3) the degree of change desired; (4) the position of the policymaker; (5) who is the program implementer; and (6) resources deployed. The contents of the policy indicate the position of policymakers, which influences how policy is implemented. In addition to content variables, there are also policy context variables that also affect the implementation process. In a policy, it is necessary to consider the strength or power, interests, and strategies used by the actors involved to facilitate policy implementation. The characteristics of the ruling institutions and regimes are also very influential. The environment in which a policy is implemented also influences its success. In addition, the level of compliance and responsiveness is also considered important in implementing a policy in compliance and response implementers.

3.1. Interest Affected. It can be concluded that the indicators of interest related to the implementation policy of the school's *Adiwiyata* program are running well. Implementing the *Adiwiyata* program policy in schools in Surabaya is quite visible from the interests of the implementers and target groups. In addition to the school carrying out its duties by the instructions from the Environmental Service, the school also has other interests, namely fulfilling its vision, mission, and goals. Not only that, but schools also have an interest in realizing environmentally friendly behavior. However, for the implementers of the Surabaya City Environment Service, there are no other interests in this policy, or they only carry out their duties following the mandated regulations.

3.2. Type of Benefits. Advantages derived from implementing the *Adiwiyata* program in the city of Surabaya are based on the policy's substance, particularly the benefits gained by people, schools, and the surrounding community, as well as the policy's implementers. Formally, the help of this program is reflected in the principles of *Adiwiyata* itself, namely, participatory, educative, and sustainable, because it must involve all elements in the school. Participatory, namely forming a culture of caring and friendly to the environment. Educative means providing education or learning. Meanwhile, sustainability has a tiered meaning or level in the *Adiwiyata* program, starting from the city level to becoming an independent habit.

Through the curriculum of the *Adiwiyata* program, which is included in the learning program, the learning process happened [48]. In this program, the type of significant benefit is not obtained by the Surabaya City Environment Agency. This is because the office only carries out the duties of the mayor. It is supported by the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia number P.52/MENLHK/SETJEN/KUM1.9/2019 concerning the movement to care and be cultured in the environment in schools. Although the school runs this program voluntarily, there are many positive benefits. Apart from the school getting the *Adiwiyata* title, this program can foster a sense of environmental care among students and all school members.

The curriculum of the *Adiwiyata* program included in the learning program environment has been proven to increase students' awareness regarding environmental problems. It has proven to make the school environment clean, beautiful, and comfortable to support teaching and learning activities. In addition, various facilities in the work program related to the climate range from student assignments and other activities such as sanitation management, recycling, waste bank, water and energy conservation.

3.3. The Extent of Change Envisioned. The existence of this *Adiwiyata* policy, according to the Environmental Service, is to create awareness and habits in preserving the environment for students in all schools in Surabaya. From this habit, the expected degree of change cannot be maximally achieved due to the nonmandatory or voluntary nature of the program. Although the Environment Agency has made efforts to disseminate, support, and provide assistance with the assistance of the Education Office, difficulties in getting schools to apply for *Adiwiyata* at the city level are still visible. This is because too many school activities and teachers' workloads impact the program administration process being hampered.

However, for some schools that implemented this policy well, many changes were felt, starting from school residents who began to get used to caring for the environment, the school atmosphere became beautiful, to the environment and community around the school, which were indirectly affected by changes for the better. In addition, with regular monitoring and evaluation, schools and students are more accustomed to maintaining the sustainability of this program.

3.4. Site of Decision-Making. The indicators for making decisions on implementing *Adiwiyata* program policies are based on government regulations revealed to be various types of decrees. The decision-making regarding the *Adiwiyata* program at the national level is the Ministry of Environment and Forestry. This institution plays a role in making regulations, namely the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia number P.52/MENLHK/SETJEN/KUM1.9/2019 concerning the Movement for Care and Culture of the Environment in Schools, as well as determining the feasibility of schools in awarding the *Adiwiyata* title. As for the location of decision-making for the city-level *Adiwiyata* program, the authorized person is the mayor, in this case, the Mayor of Surabaya, based on the Decree of the Mayor of Surabaya Number 188.45/29/436/1.2.2020 regarding the PBLHS coaching team and the Surabaya Mayor's Decree Number 188.45/107/436/1.2.2019 regarding the Surabaya city *Adiwiyata* program assessment team.

Regarding the responsibility for making decisions for the development of the *Adiwiyata* school, it is entirely given to the Head of the Environmental Service as the coordinator of the coaching and assessor team, which refers to the Decree from the Head of the Surabaya Environmental Service number 188.4/231/436.7.12/2020 regarding the determination-fostered schools. Furthermore, the principal is authorized and responsible for making decisions for the school's *Adiwiyata* program. The decision-making principle is a

guided decree issued by each school and has gone through several meetings and discussions in the forum.

3.5. Program Implementers. Following the tasks mandated by the Ministry of Environment and Forestry and the Mayor of Surabaya to the Surabaya City Environment Service, which implements the program in the Adiwiyata policy, the program is divided into two teams, namely the advisory team and the assessment team. The coaching team is a stakeholder in the city of Surabaya in collaboration with an assessment team consisting of the Education Office, nongovernmental organizations engaged in the environment, the public works service, and the Environment Service.

Although the Department of the Environment has the same task, each team has different functions and duties to the decree issued by the Mayor of Surabaya. The coaching team is tasked with working together to support the school. Meanwhile, the assessment team is tasked with screening and assessing a school's feasibility of getting the Adiwiyata title. When viewed from the implementation of the Adiwiyata program in schools, all school members such as school principals, educators, students, parents, and the surrounding community also play an essential role in the success of this program. Some schools have a structure of Officers-in-Charge of the Adiwiyata program.

3.6. Resources Committed. The policy content of the Adiwiyata program in Surabaya city with resource indicators can be concluded to be inadequate. Ideally, a policy can be judged to have been implemented successfully if it fulfills all aspects of resources, such as human resources, finance, facilities, and infrastructure. Human resources, as well as resources facilities and infrastructure, can be considered relatively well met, but financial needs can be less well met.

In terms of human resources, all school members consisting of students, educators, school administrators, and cleaning staff are involved without exception, so that the implementation of the Adiwiyata program can be felt in real terms. However, due to many school activities, the obstacle is often on the administrative side of registration for the Adiwiyata program.

For facilities and infrastructure resources, some schools have provided land for the development of the Adiwiyata program and involved stakeholders in the provision of seeds, fertilizers, and various other needs. However, it should be underlined that some schools still do not have maximum land because they are in densely populated areas.

3.7. Power, Interests, and Strategies of Actors Involved. The implementation of the Adiwiyata program is influenced by aspects of power, such as the Environmental Service, which is quite good at socializing and providing education. Hence, schools feel motivated to participate in this program. The strategies of the Surabaya City Environment Agency to make the Adiwiyata program successful include screening schools that want to apply, outreaching and assisting schools, providing consultations regarding the Adiwiyata program, and monitoring and evaluating schools.

In addition, all strategies and implementation of the Adiwiyata program in each school are the responsibility of each school, such as providing Adiwiyata program material in the school curriculum, building a drainage and sanitation system, cleaning the environment, managing waste, planting, and maintaining plants, publishing Adiwiyata programs, and cooperate with partners or other stakeholders. The school also implements the Adiwiyata program because of evaluating and monitoring this activity which is carried out by both the school and the assessment team from the office and related stakeholders.

Based on observations made in three elementary schools in Surabaya, the environment and curriculum aspects show changes and the achievement of the Adiwiyata program targets. As with the publication aspect, each school has proven to impact the surrounding community and the entire school community. In addition, most schools have collaborations with their respective partners, which are proven to support Adiwiyata activities in several schools.

3.8. Institution and Regime Characteristics. The Surabaya Environment Service deals with this problem by emphasizing socialization and sustainable assistance. The noncoercive and voluntary nature of the program not only gives schools freedom but also creates opportunities for schools to become less and less interested in registering for the Adiwiyata program due to their busy schedules. In addition, during this pandemic, the Environmental Service makes it easier for school screening by utilizing the online realm. Furthermore, the Surabaya City Environmental Service could have carried out its responsibilities well. This is known from the three informants at the school that became the research location where they were helped by the contribution from the Environmental Service regarding mentoring and consultation for the Adiwiyata program at school.

Furthermore, the school, as the spearhead of this program, has implemented the essence and obligations of the Adiwiyata program by existing regulations but have not been maximized. Based on the three schools that have been observed, it is true that Adiwiyata programs have been implemented, but the program routines are still not optimal. However, some programs from the three schools can be classified as good and impact the surrounding community and the entire school community. Overall, the context of the Adiwiyata program policy with indicators of the characteristics of the institutions and regimes in power in their implementation is quite good. Supervision is performed quite well but seems less comprehensive because program routines are less than optimal.

3.9. Compliance and Responsiveness. Based on the results of interviews with the Head of the Environmental Service, compliance in the Adiwiyata program in the city of Surabaya reaches 100%. This is because the school is very enthusiastic about being assisted in submitting to the next level, such as the provincial Adiwiyata. However, this explanation seems contradictory to the further reason that it is known that it turns out that the selection of Adiwiyata schools to be submitted at the city level is quite tricky because the teaching
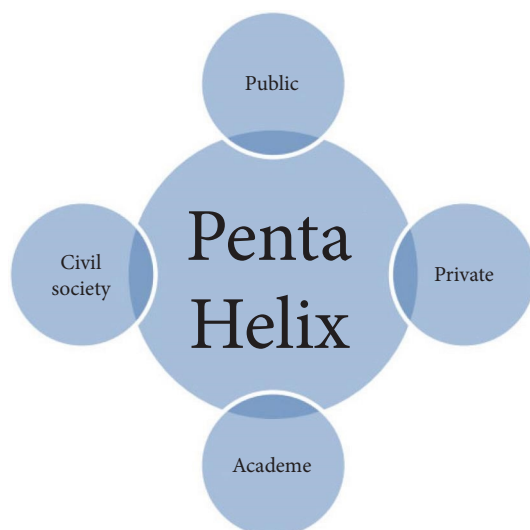
FIGURE 1: The Penta Helix [49].

staff has too much workload, especially in terms of administration. So, it can be concluded that the school's compliance is less than the maximum.

4. Discussion

4.1. The Role of Penta Helix in the Adiwiyata *Program in the City of Surabaya.* The Penta Helix (Figure 1) is a socioeconomic development model that drives a knowledge economy to pursue innovation and entrepreneurship through collaboration and beneficial partnership among the academe, government, industry, NGOs and civic sectors of the society, and the social entrepreneurs [50]. The Penta Helix model has its roots in [51] Triple Helix, where a trilateral network of academe, industries, and government combine to take advantage of the innovative research projects are cultured within educational institutions and transform these projects into viable commercial products or services. NGOs, civil society, and social entrepreneurs were added to the Penta Helix [52]. They have significant roles in supporting shared innovation goals and contributing to the region's socioeconomic progress [53].

The author has conducted research using the Penta Helix approach in this study (Figure 1). The results of the study are discussed in the following sections.

4.1.1. The Role of the City Government in the Implementation of the Adiwiyata *Program.* The government's role in the *Adiwiyata* program involves the Department of the Environment, the Mayor of Surabaya, the Department of Education, and the Department of Public Works. The Department of the Environment plays a role in accepting what must be prepared to implement the *Adiwiyata* program. In addition, the Surabaya City Environmental Service screened schools that have not implemented the *Adiwiyata* program where this activity is carried out online, which is carried out at the beginning of every year, namely in January. The school can pass and be entitled to become an *Adiwiyata* school at the city level. Before the school screening, the Environment Agency provides socialization to ensure that

the schools that carry out the screening are ready during the verification process [54–56].

The Mayor of Surabaya, through a decree, determines the schools that are Penta Helix Public Private Academe Civil Society entitled to the title of *Adiwiyata* school through a verification process carried out by the Environmental Service in February. The Environmental Service carries out a monitoring and evaluation process to the school once in a new academic year, namely in July, at all levels of *Adiwiyata*.

4.1.2. The Role of Academics in the Adiwiyata *Program.* One of the roles of academics in the *Adiwiyata* program is the school, which in its implementation involves all school members starting from students, principals, teachers, cleaning managers, security, school canteens, committees, and guardians of students. With the involvement of all elements, the positive impact obtained is not only on the school community but also on the residents. The role of academics through educators during a pandemic can also be done by giving assignments to students based on the environment that can be done at students' homes. For example, students are given the task of planting plant seeds using cotton and glass media; then, students are asked to make observations as far as possible on the progress. After being observed, the students gave the results of these observations to the teacher; with this activity, students learned about environmental science and that plants do not have to be planted using soil media, but cotton media can also be produced. Another example is through the commemoration of Earth Day; school students are taught to socialize with the surrounding community through banners and posters containing an invitation to preserve the environment.

4.1.3. The Role of the Private Sector or Business in the Adiwiyata *Program.* The private sector is an inextricable stakeholder in driving and sustaining outcomes capable of moving countries beyond the need for assistance. Today, the private sector is playing an unprecedented role in creating and shaping opportunities that improve the lives of the people and communities in Indonesia. The public–private partnership strategy is a partnership model based on the best provider framework (the best source). With the best framework, the government can encourage the private sector to be involved in giving certain public services, further improving efficiency and service effectiveness (value for money) and providing the best solution for both the government and the private sectors.

The implementation of cooperation between the Environment Agency and the private sector has been going well but is still lacking. This is because the private sector is directed to work directly with the school. If the school already has an *Adiwiyata* title with the highest level, namely the national level and the independent level, the private sector will immediately offer to cooperate with the school. The form of cooperation carried out by the private sector, and the school is through corporate social responsibility.

4.1.4. The Role of Civil Societies in the Adiwiyata *Program.* Civil society is individuals and community groups interacting
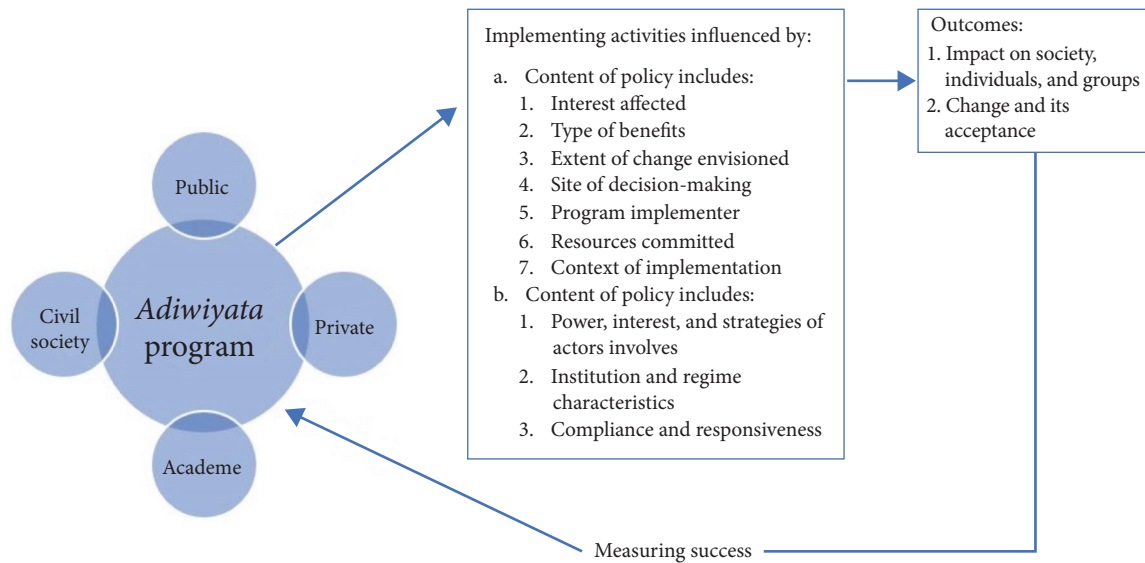
FIGURE 2: The Penta Helix model in the implementation of the *Adiwiyata* program.

with each other in the spirit of tolerance in a region or country. Inside that space, society participates in the process of making public policy. Besides, some understand civil society as an association of people who civilized voluntarily and lived in a social order with mobility and cooperation between all elements of society.

The role of the community in the *Adiwiyata* program has been perfect so far, proven during the screening and verification process for *Adiwiyata* schools. However, there are also challenges if the school's environmental conditions are in a village area or densely populated where the behavior of the surrounding community is very lacking in terms of maintaining environmental cleanliness. This is a challenge for schools in overcoming problems around schools to provide socialization to local officials such as neighborhoods, hamlets, urban areas, and subdistricts, so that they can provide understanding to the surrounding community about the importance of maintaining environmental health.

4.1.5. The Role of Mass Media in the Adiwiyata *Program.* The role of social media in the *Adiwiyata* program plays a vital role, especially in the current pandemic conditions. The social media that are often used are Instagram and YouTube. All activities related to the *Adiwiyata* program can be uploaded or published on social media in the form of images and videos. The aim is to provide public education, information, and promotion regarding the *Adiwiyata* program. The response or response from the public who saw the posting of activities about *Adiwiyata* was excellent, and they were pleased about the existence of these activities [18]. The Environment Agency also gave directions to the school to form a special team that handles documentation and publication of *Adiwiyata* activities in schools because, during the pandemic, the screening process and *Adiwiyata* assessment are done online. So, it is enough for the assessment team to do a virtual evaluation through documentation and school publications about the *Adiwiyata* activities. In addition, the assessment team also visited the school's website and social

media to determine whether the school was active in carrying out activities and updated publications of *Adiwiyata* activity documentation because many schools rarely actively publish *Adiwiyata* activities through social media and websites [57].

4.2. The Penta Helix Model in the Implementation of the Adiwiyata *Program in the City of Surabaya.* After the researchers conducted research on the implementation of the *Adiwiyata* program in the city of Surabaya by taking several elementary schools in the city of Surabaya where the researchers used two theories, namely the implementation theory of Grindle and the Penta Helix theory developed by Etzkowitz and Leyesdorff in 2000 [52], design and build an innovation model, the *Adiwiyata* program is expected to be able to answer the Penta Helix program solutions that are not yet optimal, especially in Surabaya and generally, in Indonesia; Figure 2 shows an innovation of the *Adiwayata* program using the Penta Helix approach.

As shown in Figure 2, it can be understood that the *Adiwiyata* program is implemented with the Penta Helix theory, which consists of four elements: the public, private sector, academics, and civil society. Four sectors determine the successful implementation of this policy. Then the *Adiwiyata* program can be measured through the implementation model Merle Grindle deserved. This theory is appropriate to decide whether this program is successful and running well or if there are still many shortcomings. If this policy is successful, outcomes will be obtained in the form of impacts for students who have the character of caring for the environment.

5. Conclusion

Based on the results and discussion in the previous sections, it can be concluded that (1) the role of the City Government in the implementation of the *Adiwiyata* program has been carried out optimally; this is shown by the Mayor of Surabaya, the Environment Service, the Education Office, and the Public Works Office, who have carried out their

respective main tasks and functions well; (2) the role of academics in the *Adiwiyata* program has been running optimally; this is shown by the involvement of all elements of the school community. Especially educators who contribute significantly to the teaching process by providing environment-based assignments that can be done at school or home; (3) the private sector or business role in the *Adiwiyata* program has not run optimally. This is shown by the cooperation carried out by partners who mostly choose *Adiwiyata* schools with only the highest level; and (4) the role of the community in the *Adiwiyata* program has not run optimally. This is indicated by schools in densely populated neighborhoods and people who lack the awareness to maintain environmental cleanliness. This is a challenge for the school in socializing at the urban area level regarding ecological cleanliness. The role of mass media in the *Adiwiyata* program has been running optimally. A positive response indicates this. With this positive response, the Environment Agency gave directions to form a special team for documentation and publication.

5.1. Limitations of the Study. This research is limited to prevent too broad a discussion. These limitations are as follows:

(1) In conducting this research, researchers will examine how the concept of implementing *Adiwiyata* schools in several schools in Surabaya.

(2) Environmental concerns in this study are only determined by the influence of the application of the school concept *Adiwiyata*.

(3) This study seeks to create a model of the *Adiwiyata* school that is connected to the Penta Helix concept so that the *Adiwiyata* program can run well.

5.2. Recommendations

(1) The *Adiwiyata* program implementers have cooperated and performed their main tasks and functions well. Therefore, good cooperation and primary operations are maintained to properly produce programs related to *Adiwiyata*.

(2) The role of academics in the *Adiwiyata* program has been going well; therefore, academics can be strengthened again to provide innovations related to the *Adiwiyata* program.

(3) The private sector's role in cooperation with schools is still not optimal. Therefore, the Environmental Service, the implementer of this program, should have the authority to determine which schools will be assisted by the private sector so that *Adiwiyata* schools in Surabaya progress evenly.

(4) The community in the *Adiwiyata* program is not optimal because there are still people who have not maintained cleanliness around the school. The school can do things through a campaign about the importance of keeping the environment clean, or it can also be done by placing posters and banners around the school to protect the environment.

(5) The role of the mass media in the *Adiwiyata* program in schools has been going well; this should be maintained considering that the mass media currently has a significant impact on the dissemination of information and communication.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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