

# Innovation potencies to conserve the environment quality in the young generation

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## Innovation potencies to conserve the environment quality in the young generation

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**Abstract.** Environmental damage that has occurred in Indonesia has severely disrupted public health. This condition shows that there needs to be a breakthrough in the form of innovations, especially in terms of technology to prevent and control of environmental damage. This study aims to investigate the potential for innovation in the field of environment that was generated by Indonesia's young generation. The method used in this study was the distribution of questionnaires to 78 respondents randomly and a review of secondary data. The results of the study show that innovations to improve environmental conditions are not solely by making pollution control devices, but also innovations related to the use of environmentally friendly energy, waste recycling, and innovations that can change the behaviour of people as polluter. The results also showed that only 50% of respondents felt the support of the Indonesian Government towards innovation development programs. The biggest obstacle for respondents in realizing innovation is limitation in funding. Therefore, the most needed activity is training on how to develop ideas into innovations and potential funding that can realize these innovations. There are 76% of respondents interested in applying the intellectual property for their innovations in the form of patents or copyrights.

### 1. Introduction

The population of the city, the urban area, in Indonesia is increasing, resulting in high usage of natural resources regardless of the carrying capacity of the environment. Human activity that increases rapidly leads to high concentrations of pollution emitted continuously to the level that it cannot be self-purified by nature [1]. Severe environmental conditions can cause the low quality of human life, especially for the younger generation. Various efforts have been made by the government to overcome the high level of pollution that occurs in this city. However, these efforts have not provided satisfactory results.

Government efforts to improve environmental conditions have been carried out both technically and non-technically, using hard engineering, such as infrastructure development and using soft engineering, such as counselling to increase public awareness in environmental preservation. These efforts did not show significant improvements to environmental quality because the methods used were irrelevant and did not provide awareness to the community. Buildings and sewage treatment plants that are applied often use conventional types that require large areas and expensive costs. The limited budget for operating and maintaining the installation is also an obstacle in maintaining processing performance. The community awareness also cannot be raised only by conventional methods. Therefore, there needs to be a breakthrough in the form of innovations, especially in terms of technology to prevent and control of environmental damage. Discovery and innovation are closely related to new technologies that



logically should be born from the young generation [2]. Creative thinking and ideas usually arise from productive age groups who expect increased welfare in their lives. Nevertheless, this condition can fail if the young generation is physically and mentally weak, the environment does not support, and government institutions do not encourage it.

In academia and universities activities, opportunity programs to improve the quality and quantity of innovations have been offered by the government through the Ministries of Research, Technology and the Higher Education of the Republic of Indonesia. However, the program has not yet produced innovative works that are relatively helpful in improving the environment. The young generation should be actively involved in these innovation programs. The concern that arises is the disinterest of the younger generation in innovating opportunities or the presence of other constraints.

This research was conducted to find out the views and interest of the younger generation in innovating activities, especially those related to environmental conditions and improvement efforts. This study will be used to provide recommendations to stakeholders, especially the government and innovation institutions to increase the active participation of young people in producing innovative and creative products.

## 2. Methodology

This research was conducted mainly by collecting data from distributed questionnaires. The respondents were communities of productive age who live in urban areas and are educated. To focus on respondents with these criteria, questionnaires are disseminated in the academic or college areas. The questions posed in the questionnaire include the profile of respondents, respondents' interest in innovation activities, and fields of innovation that they wanted to realize and views on environmental conditions in Indonesia related to innovation activities.

Questionnaires are arranged using closed-type questions which have choices of answers, and open-type questions that respondent can write the answer freely. Closed-type questions are intended to get information about the area of innovations that are of interest to the respondents. The field of innovation in this research is focusing on product that is related to the environmental preservation. In addition, there was also opinion of respondent concerning the importance of the copyright of innovation works.

The distribution of questionnaires was conducted via the internet using the Google form application. Respondents were obtained from several universities in Indonesia. Data obtained from the results of filling out the questionnaire is processed in a simple way to get the tendency of the younger generation's opinion on innovation in Indonesia. The results of the questionnaire were then enriched with literatures and being used to further analyze the condition of innovation program in Indonesia. Based on this outcome, the recommendation of programs can be formulated in order to activate the young generation concerning activities to produce useful innovation, especially to overcome the environmental damages.

## 3. Result and discussion

### 3.1. Profile of respondents

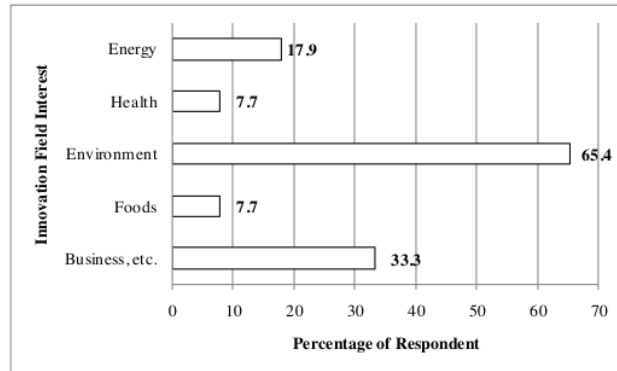
Distribution of questionnaires was conducted with the target of respondents who were in productive age and educated. The questionnaire results showed that the dominance of respondents was university students with ages ranging from 19 to 24 years. There are also respondents over the age of 30 who are active in professional activities such as lecturers and consultants. This profile shows that the questionnaires were filled in by respondents who were in accordance with the target, the young generation. This group of respondents is a community group that has high potential to produce innovative products for the needs of the community, especially in Indonesia.

### 3.2. Field of innovation

The results of the questionnaire regarding the areas of innovation that the respondents were interested in showed that the environmental sector was the topic of the most interesting (65.4%), followed by other fields such as business, arts, defense security, etc. (33.3%). Because the government is pushing start-

ups in the creative and business industries, this field has become popular among the younger generation [3].

All respondents have an interest in innovating with varied fields. Figure 1 shows the percentage of field of innovation that the respondents were interested in. Topic of energy as innovation field was also interested by respondents. It can be related also to the environmental quality improvement need.



**Figure 1.** Percentage of respondent interested in specific innovation field.

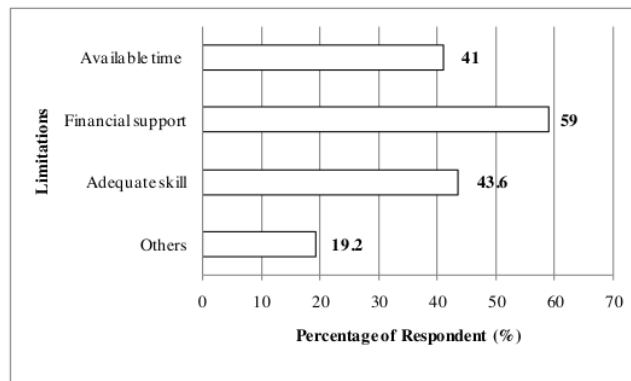
The respondent's innovative ideas for environmental fields included environmentally friendly food packaging, water treatment at the disaster site, recycling grey water for clean water, green ecosystem development, utilization of wood waste, processing of plastic waste, green energy and utilization of household waste.

Mostly, the respondents concerned to the waste treatment. It probably because of urban areas in Indonesia suffer from massive emission of wastes. Rivers in urban areas experience pollution both in the form of liquid and solid pollutants. Green energy is also popular in the young generation [4] due to severe air pollution occurred and the rise of global issues such as climate change, ozone layer depletion, acid rain and global warming.

### 3.3. Innovation development obstacles

All respondents stated that there were obstacles in realizing the innovations that they wanted to develop. The biggest obstacle was funds limitation that was found in 59% of respondents. Other obstacles encountered were skill limitation (43%) and time constraints (41%). This result is shown in Fig. 2. The young generation uses more of their time to work in order to fulfil their needs. The development of ideas in realizing innovation is considered as an activity that consumes personal time and money. Meanwhile, the development of innovation requires full concentration that needs a lot of thought, time and energy. In addition, innovation cannot be realized if it only relies on the knowledge of one individual. The ability and knowledge needed to obtain complete innovation results must involve many disciplines [5].

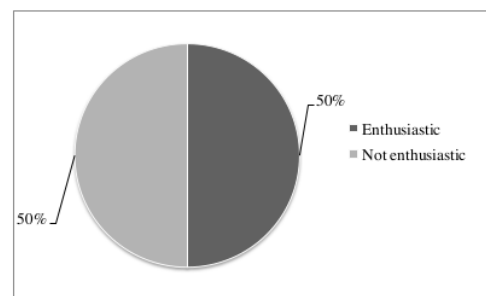
The productive generation of Indonesia has the assumption that innovation is an entrepreneurial activity that requires financial independence. There are still not many people who are courageous to be independent in entrepreneurship. In addition, education about entrepreneurship is still not comprehensively mastered by the community [6].



**Figure 2.** Limitations/constraints in innovation development.

#### 3.4. Enthusiasm of government and community on innovations

The spirit of innovation is one of the bases for a country or community in dealing with changing era, especially to maintain the economy stability [7]. Based on the research survey, 50% of respondents stated that the Indonesian government and people were enthusiastic about innovation. This figure shows that the level of enthusiasm in Indonesia appears to be relatively low.



**Figure 3.** Respondents' opinion on government and community enthusiasm concerning innovation.

Through several institutions, the government has offered several grants to the community related to funding the development of innovation. This opportunity for funding innovation is primarily distributed via the Ministry of Research and Higher Education. The Directorate General of Learning and Student Affairs of the ministry conduct a financial opportunity competition for students each year in the Student Creativity Program.

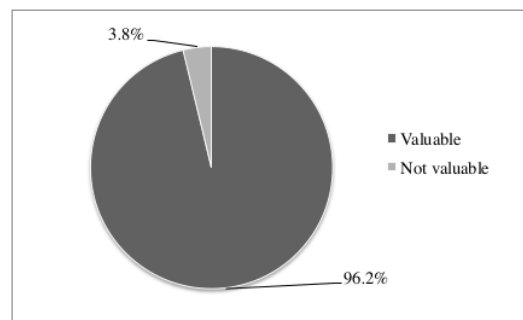
The opportunity of innovation development funds is also provided through the Ministry of Research, Technology and Higher Education for lecturers and university students. The funding grants include basic research programs, applied research and development research. The results of the research are also offered to be developed so that they are ready to be marketed and become products of innovation that are beneficial in society and industry.

In addition to the government, several private institutions also offer competitive funding to the public for programs related to innovation, both in the form of research activities, business plan preparation, entrepreneurial initiation, etc. Usually, the target applicants of this program are researchers and the younger generation. Government policies concerning the support on innovation activities in the community can be a good promotion [8].

### 3.5. Innovation property rights

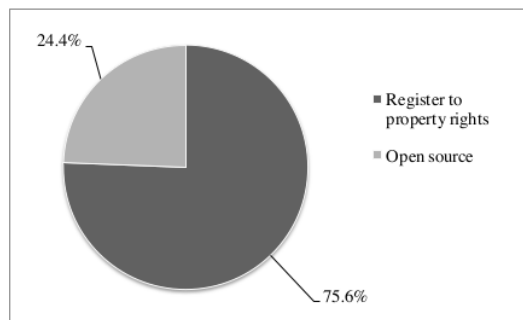
The rapid development of new innovations in the world has an impact on increasing public attention to intellectual property rights. The patents owned by the inventor of the product are made so that the idea of innovation is not used by others without compensation. However, on the other hand, there are also communities that give up their products not protected by copyright and free to be used by others. Computer or cellular phones applications for example, there are several software that are open source. Interested people can use it freely both to be applied directly or modified as needed.

Based on the results of the survey in this research, as many as 96.2% of respondents stated that intellectual property rights are valuable things in innovation programs (Figure 4). The Indonesian government through the Ministry of Research, Technology and Higher Education also encouraged innovators to register their discoveries to increase the prestige of the Indonesian state in the scientific world. In addition, intellectual property can be a source of income for the owner if the invention is used by another party to be produced.



**Figure 4.** Respondents' opinion on innovation property rights.

Although the majority of respondents (96.2%) stated that intellectual property rights are a valuable thing, as many as 24.4% of respondents plan their findings open unregistered. The purpose of this unregistered invention is to provide an opportunity for the invention to be further refined or improved. In addition, some inventors are not comfortable with the process of registration of intellectual property rights which is relatively inconvenient, takes a long time and costly.



**Figure 5.** Respondents' intention on their innovations.

The Indonesian government, through several ministries, also offers programs for managing the registration of intellectual property rights. Some programs also provide grants in the form of funding for the registration. The Ministry of Research, Technology and Higher Education periodically provides assistance to innovators in universities in the form of training in making patent documents, assistance

with initial arrangements and financing. This program has succeeded in helping researchers from universities to register the results of their research with the Ministry of Law.

### 3.6. Program recommendations

Respondents conveyed a number of program recommendations that could be done to improve the innovation activities. The program that was most recommended by respondents was training. The ignorance of the community regarding programs that can help realize innovation results in low findings from Indonesia, including from the younger generation. Therefore, there needs to be massive socialization in informing the offer of assistance. Assistance provided can follow current trends, namely using information technology-based techniques and media such as e-counselling or cyber counselling [9].

Studies also show that the younger generation must be enriched with literacy, namely the ability to read and write. This literacy is useful in understanding information and knowledge about technology and important aspects of innovation [10].

## 4. Conclusion

It can be concluded that the young generation of Indonesia is enthusiastic about creative activities to produce new innovations, including improving environmental conditions in big cities or urban area. In addition, in managing waste and improving environmental sanitation, the young generation is also interested in innovation in the field of energy which is also indirectly related to environmental improvement. The biggest obstacle faced by the young generation in realizing the desire to innovate is limited funds, stated by 59% of respondents. As many as 50% of respondents stated that Indonesian people and government were enthusiastic about innovation. However, the knowledge on how to manage to start and proceed the innovation activities is still low. Therefore, it needs to be massive socialization in informing the offer of assistantship to support innovation process.

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