Architecture as a tool to achieve the 17 United Nation Sustainable Development Goals

D Setiawan¹,
¹ Architecture Department, Faculty of Engineering, Bina Nusantara University, Jakarta, Indonesia, 11480

Corresponding author: denny.setiawan@binus.ac.id

Abstract: As a researcher and architect, the author creates several architectural works, most of them are located on the Java island, Indonesia. The author believes that building with ecological principles and green architecture is important today to adapt to climate change and prevent the worst from happening. By testing these projects with the theory of ecology and green architecture, the authors get several conclusions that every project built must be able to answer climate problems that occur at this time.

In this paper the author will describe the use of the 17 United Nations Sustainable Development Goals or we commonly knows as SDGs in his works on the island of Java, Indonesia. Architecture is a tool to achieve the Sustainable Development Goals.

Keywords: ecological design, green architecture, architecture, climate change, material, built environment.

Acknowledgements: Binus University, and Studio Denny Setiawan Architecture lab.

1. Background of the Sustainable Development Goals

Architects can provide basic ideas and proposals for regulations that make it possible for us to have sustainable cities and communities in the future. Architects can facilitate to open dialogue and work in partnerships to give us good solutions and can encourage authorities to make the regulations necessary to move forward. - Mogens Lykketoft, Former Danish Minister of Finance and of Foreign Affairs, President of the United Nations’s General Assembly from September 2015 to September 2016.

Architect and architecture play a great role to create a sustainable environment. The statement above state that in the effort to achieve the 17 United Nations Sustainable Development Goals (17 UN SDGs),
the world need good architects with their architectures. As we know, talked about 17 UN SDGs, we need to discuss:

1. No Poverty
2. Zero Hunger
3. Good Health and Well Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reduce Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnership for the Goals

The whole point in the SDG’s requires an interactions with the architectures. For example, good architecture will provide its users a place to do their economy activities. The Economy activities will swipe away the poverty and generates new industry, innovation and infrastructure. Good architecture will also provide clean energy. It will not only use renewable energy but also provide an alternative energy such as solar power plant. These are some example how good architecture’s role in the effort of chasing 17 UN SDGs are very important.

2. Data Collection
In this paper, the writer will show some of his works that play a good role in terms of fulfilling some goals in the SDG’s. Writer will show and explain how his works are fulfilling some principles of sustainability that stated by the SDGs. The projects are:

2.1. Boarding House near University of Indonesia
University of Indonesia is in the border of the capital city of Indonesia, Jakarta. As a major city in Indonesia, urbanism become a new problem in the city. People in diversities came to the capital city and create a high density. Land prices are increases then make a lot of citizens got its difficulties to have a small piece of lands. This situation creates poverty, inequalities, poor health and injustice. These problems are challenges against the SDG’s. Citizens are required to take actions to solve some of the problems.

This boarding house is located near the border of the university. It takes place in a dense environment. The surrounding filled with students boarding houses. Some of the boarding houses shown in these figures:
By seeing these figures, we know that some requirements of healthy living were violated. Heat caused by the air conditioner machine and lack of natural lighting were happen along the corridors. In the research we find some of the rooms don’t have any windows for ventilation. This situation is of course far from our expectation to achieve the sustainable development goals.

In effort to achieve good education, we need to put attention in student’s dormitory or the place where they are living. By using air conditioner and light bulb along the daytime, we use to many conventional energies. In the SDGs, we need to promote the uses of clean energy. The way they live is very important to achieve the SDGs.

In that case Studio Denny Setiawan, an architecture lab offers a design of boarding house with sustainable concept. They called this building as MQ Boarding house. The boarding house use double loaded scheme so the wind can be flow crossly along the corridors. The schematic is shown like this:

The advantages by using this concept, we can promote:
1. Less energy used to light up the corridors
2. Lower electricity price due less usage of power
3. Lower temperature in the corridors
4. Higher human interaction inside the building
5. More natural disinfectant created by direct sunlight
6. Aesthetically pleasing
7. Cleaner corridors caused by there is no dark spot that produce dusts
And several other benefits
With that concept, Studio Denny Setiawan made the plans like in these figures:

![Figure 6-7. 1st floor and typical floor plans of the MQ Boarding House](image)

This July 2021, the building has been built and it showed like this:

![Figure 8-9. Built exteriors](image)

The materials of this facades made from used brick powder and cements powder which are sprayed in all surfaces of the building. By using these materials, we use less of new natural resources and make the cost lower. Lower built cost makes a possibility to make the rent cost even lower. Lower prices with better living quality create a good living and education surrounding for students.

The buildings are made by many corridors like shown in the figures bellow. Architects deliberately expose whole Mechanical, Engineering, and Plumbing system. The purpose is to make the maintenance
easier while minimizing new materials as ceilings materials. The built corridors are shown in these figures:

![Built corridors](image1.png)

**Figure 10-12. Built corridors**

These simple corridors assure us that whole building filled with fresh and clean air.

Beside the corridors, whole room units for the students are having its own window and ventilation. By having good natural lighting, rooms are looked bigger than it must be. The rooms are shown like this:

![Unit rooms](image2.png)

**Figure 13. Unit rooms**

3. Conclusion

By showing MQ boarding house project, writer show that architecture as a tool to achieve some of the goals. Goals that are achieved are:

1. No Poverty
   By make less prices of living cost, it potentially become a saving for every user of this building
2. Zero Hunger
By having enough saving, the user of this building can have more to eat as it needs. By making a good living space, this building will create potential economic activities for its surroundings such as: food stalls, coffee shops, laundry, cellular phone pod etc

3. Good Health and Well Being
   This boarding house was built focused of user’s good health and their convenience to live. By having good natural ventilation and lighting. It will generate good health to the whole user

4. Quality Education
   By building this boarding house, architecture can generate same chances to whole people to access good education quality and equality to the university of Indonesia.

5. Gender Equality
   By good architecture, man and woman can access good living and good education

6. Clean Water and Sanitation
   This building provides a good sanitation system not only for its fresh water but also for its waste air management system

7. Affordable and clean energy
   By using less of air conditioner and artificial lighting, this building is less using a non-renewable energy. This effort makes the clean energy more affordable

8. Decent Work and Economic Growth
   This boarding house creates some potential economic activities nearby. People nearby can open some shops that fulfilling student’s needs

9. Industry, Innovation, and Infrastructures
   This boarding house is a student boarding house. This building was built near the campus, campus is the centre of innovation. This building determines innovation for humanity founded.

10. Reduce Inequality
    By having less prices, it will create equality for all people

11. Sustainable Cities and Communities
    This building was built by less new materials as possible and focused on how it uses less energy to operate. This effort will become an example for the city to build a sustainable environment

12. Responsible Consumption and Productions
    The use of natural resourcing will assure the responsible of non-renewable resources

13. Climate Action
    By using less new materials and less energy to operate, this building is a living action to face climate change

14. Life below water
    This building use reuse water in its operation. This building also using rainwater to water the plants. This action is an action to taking care life below water

15. Life on Land
    MQ boarding house is an example that we need to take good action for a good living on land
16. Peace, Justice and Strong Institutions
   By making people educated, we are promoting peace, justice and strong institutions

17. Partnership for Goals
   This building made by a good collaboration by many peoples

By showing all the facts and actions after this building is built, writer believe that architecture is an important actor to achieve 17 UN Sustainable development goals.

References
[1] Studio Denny Setiawan documentation
[2] Mossin etc “an architecture guide to the UN 17 sustainable goals”, Coppenhagen 2018
[3] www.google.com/kos-kosansekitaruidepok