

## THE EXISTENCE OF SUSTAINABLE SETTLEMENT IN SURABAYA AS AN ATTEMPT TO REALIZE *ECO CITY*

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### ABSTRACT

*The existence of kampungs or township settlements in Surabaya is very essential to the city development seen from the historical aspect of Surabaya which grew from the development of township settlements. Therefore the issue of sustainable development to create a good living environment can be applied to the settlements sector in Surabaya in order to turn Surabaya into an ecological city, so that the efforts of citizens in Surabaya in the eco kampung activities can make a significant contribution in the realization of the ecological city. Kampung Kertajaya Surabaya is one of the township settlements in Surabaya that applies sustainable development with the cooperation of the residents and City Government.*

**Keywords:** *Eco-city, sustainable settlement, Surabaya.*

### ABSTRAK

*Keberadaan kampung atau perkampungan di Surabaya sangat penting bagi perkembangan kota dilihat dari aspek sejarah Surabaya yang tumbuh dari perkembangan kampung. Dengan demikian, isu mengenai pembangunan berkelanjutan untuk menciptakan lingkungan hidup yang baik dapat diaplikasikan pada sektor permukiman di Surabaya untuk menjadikan Surabaya sebagai kota ekologis, sehingga usaha masyarakat dalam aktivitas kampung ekologis dapat memberikan kontribusi yang signifikan dalam mewujudkan kota ekologis. Kampung Kertajaya adalah salah satu kampung di Surabaya yang menerapkan pembangunan berkelanjutan dengan kerjasama antara penghuni dengan pemerintah kota.*

**Kata kunci:** *Eco-city, permukiman berkelanjutan, Surabaya*

## INTRODUCTION

Sustainable development is a conscious effort and it plans to use and manage resources wisely in a planned and sustainable development to improve the quality of life. In an effort to make it happen, there are several parties that have been made to reach a mutual agreement, conferences and global agreements have been made, including:

### Agenda 21

Agenda 21 is an action plan of the United Nations (UN) related to sustainable development and is the result of the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992. In the structure and content of the Agenda 21, there are 40 chapters in Agenda 21, divided into four parts: Part I (Social and Economic Dimensions), Part II (Conservation and Management of Resources for Development), Part III (Strengthening the Role of Major Groups), and Part IV: (Means of Implementation).

### Rio +20

In 1992, the initial implementation of the first Earth Summit, the people realized that sustainable development cannot be achieved by government alone and will require the active participation of all sectors and all levels of society. Therefore, a global meeting was conducted to discuss the measures to be agreed in order to improve the quality of life and preserving the earth.

Rio +20 in 2012, raised the topic of maintaining political commitment for extended sustainable development programs (Sustainable Development), which includes the rights-based approach to basic needs (food and water), access to information technology, reformation of harmful subsidies with adequate protection of vulnerable groups, sustainable energy for all and basic social protection.

Several researches regarding sustainable development concept have been conducted. One of the is conducted by Peter Kellet namely "*Sustainable Rural Housing And The Challenge Of Climate Change: Experience From Ethiopia*". This study revolves around the sustainable development attempt in settlements aspect. The object of the research is the search for solutions to sustainable design vernacular architecture of Ethiopia relating to the response to climate change that is happening for the foreseeable future. This study suggests the efforts to implement sustainable development in Guraghe traditional settlement to realize environmentally sustainable settlement without leaving their cultural identity. Factors to consider in this effort is the sensitivity to the cultural context, the testing process that may result in the worst conditions, the use of local materials and the exploration of alternative construction materials and related systems, resource efficiency, *Independent Energy Generation* as an attempt to give counselling to the residents is so important, John Turner's idea on the creation of settlements by residents is more feasible than the creation of community housing for people (Turner, 1972, 1976).

Outlines of State Policy (GBHN) 1993, mandates that national development should be carried out by the community and the Government. Community events and government program should support and complement each other, intertwined in unity to realize national sustainable development. Based on the background of the issue of sustainable development, the writer felt the need to conduct research on the efforts of the villagers and the government in Surabaya in achieving sustainable development to create an ecological city of Surabaya.

## **THEORY / RESEARCH METHODS**

The research methodology used is qualitative paradigm. Generally, case study is a strategy that is more suitable when the subject of a research question is in regard to how and why, when researchers have little opportunity to control the events that will be investigated, and where the research focus is on contemporary phenomenon (present) in the context of real life (in Yin, 2002:1). This study focuses on the efforts made by Kertajaya residents in the attempt to achieve eco-village to be able to contribute to realizing Surabaya eco city.

The case study will take place in Kampung Kertajaya RW XIII, Kelurahan Gubeng, Surabaya. The subject of this research is the condition of the kampung neighbourhoods and residents Kertajaya RW XIII participating in running eco village events. RW is a term of administrative unit at the next-to-lowest level in city.

Technique of data collection used in this study is the observation, in-depth interviews and documentation. The analysis in this study is divided into three parts. First, data reduction; data reduction is done after acquiring data from observations and interviews conducted in Kampung Kertajaya, obtained from the informant. Next is selecting key points that correspond to the research focus, then group by theme. Second, in interactive data analysis is the presentation of data (data display). The last stage in the interactive model of data analysis is conclusion (verification). After all the study procedures had been carried out, the researcher will draw conclusions from the findings.

## **RESULTS AND DISCUSSION**

### **Principles of Environmental Urban Development**

Nowadays, the development of large cities has increased and has exceeded the carrying capacity of the surrounding ecosystem environment. The increasing population will also have an impact on the growing need for adequate and livable housing facilities. Therefore, land is getting over-occupied and inadequate and it causes the rice paddies and fertile land to decrease in width and quality since it is used for housing and industrial development, where it has a direct impact on the decrease in the production of food and clothing. Higher population growth resulted in higher levels of population, either in the air, the water and the amount of the greenhouse effect as a factor contributing in global warming. Hence we need awareness as living beings

(humans) to create a city or a healthy environment by making sustainable development movement, which would create a livable shelter for living things and to care for and save the earth.

Damage in the earth is caused by human activity itself; therefore, to overcome the negative impact of human activity, the direction of development planning must be changed from the conventional development course which is only concerned with economic growth into a plan for environmentally sustainable development. To realize the urban sustainable development, we can start from the micro elements in forming a city, from the settlements scope.

Ebenezer Howard (1898) gave an opinion on the natural involvement in building a city, where it will become a pride (landmarks) in the city planning, which is later known as the garden city concept. The concept of the garden city according to Howard that a city with a large scale is not feasible for a place to live and thus would not be an ideal plan for building a city with an unhealthy environment resulting in the possibility of city dying.

The concept is contained in the formulation of vision of the city associated to ecological sustainable city that is creating the harmony with nature and the surrounding environment. Because some consequences may occur, the public should begin to realize the importance of a careful use of energy resources, creating renewable energy sources and reduce pollution sources in order to create an ecological city or healthy town.

### **Sustainable Development in Settlements**

The development of sustainable settlement is conducted to make a healthy and well-maintained settlements environment in order to support sustainable development. Housing and settlements also have a strategic role in the formation of cultural or national identity, so it takes a long training process and development for the survival and improvement of people's lives for the better. Settlements are functioning as a forum for the development of human resources as well as contributing to economic growth through the housing sector as an employer and a major encouragement of capital formation. Through the improvement as well as the fulfilment of the need for housing and settlement, the society is expected to increase the productivity, take part actively in development, and able to increase capital accumulation for further development.

Housing and settlement development as part of national development in the PJP I (long-term development) have shown significant improvement, i.e. the fulfilment of the need for basic infrastructure and increased quality of residential neighbourhoods and settlements both in urban and rural areas. Regarding the development of urban and rural housings, the government has set the standard rules on the physical aspects of housing and settlement development.

This report is concerned with the settlement sector where one kampung in Surabaya became a case study in the discussion. Kampung Kertajaya RW.XIII Surabaya has become a pilot village in environmental movement in which the residents or society actively participated in the development, whether in water waste management, waste management, drainage, and clean water supply that can potentially af-

fect the economic and socio-cultural aspect of the society that will be elaborated further in the discussion of case study.

### **Green Economy**

At the UN Conference on Sustainable Development 2012 (UNCSD) or 'Rio +20', it is revealed that we face a critical moment in Earth's history, when people must choose its future. The notion of 'green economy' as one of the core themes for the summit showed significant opportunity to define a new global economic paradigm, but it also includes the risk that a global agreement on sustainable development may be lost in the pursuit of a new agenda. There also several definitions that has yet to cover "green economy", this makes the initiators feel tired of the idea's application and implementation.

Green economic principles of the conference results are summarized as follows: Equitable distribution of wealth (welfare equalization where no difference between the rich and the poor with the aim of achieving social and economic justice), justice and economic equity (principle of equality with different responsibilities), intergenerational equity, approaches to prevention (improving science should be put to good use).

### **Ecological Systems in Environmental Settlement**

In an article there is a quote "An Eco-city is an ecologically health city" (Richard Register, [www.treehugger.com](http://www.treehugger.com)), which means the ecological city is a healthy city. A healthy city is a city in which there is a balance between the development of the city and preservation of the environment. More broadly, the notion of an ecological city can be elaborated as a city in which the reciprocal relationship between city life with its constituent environment take place. Fundamentally, ecological city has a function similar to the function of an ecosystem. In this case the ecosystem in question is the relation between urban ecosystem with natural ecosystems.

Ecological city needs to be realized in any growing city due to the increase in population that is increasingly out of control. From these explanations, practical ecological city is a city that can reduce the burden and pressure on the environment, improve the living conditions to be livable and help achieve sustainable development, including the comprehensive improvement of the city. Residential sector is a sector that is closely related to achieving an ecological city. This can be supported by a sustainable society.

### **Low Toxic Construction Systems**

In urban development, the use of environmentally friendly construction system plays a role where it helps to realize a sustainable urban environment. Implementation of the construction system is associated with the use of energy, exhaust systems, land and environment design, recycling, and the application of rules. Materials and construction systems that are applied to a building should be qualified in terms of environmental friendliness, which is realized through technical efficiency in buildings,

outdoor and indoor construction management, and the use of solar energy technology both actively and passively, as well as paying a close attention in the application of materials and environmentally friendly building components (Bierman-Lytle, 1992).

### **Sustainable Community**

Community empowering has been a popular term in society these days. Community empowerment is one of the movement methods used in running community development programs, both in the economic, social, cultural, educational, health, or a combination of all these aspects. An activity of community-based development is a form of real development (Silas, 2012). A city development is better be done by both the community or society and the government. The creation of a sustainable society is in regards to realizing a responsible economic development, social inclusion and social justice, in response to social segregation, effective environmental management, successful city, and an integrated spatial development.

### **Case Study: Kampung Kertajaya RW 13 Surabaya in the Attempt to Realize Environmentally Sound City Development**

The location of the case study is in kelurahan Kertajaya, kecamatan Gubeng, the city of Surabaya. The focus of the research in kelurahan Kertajaya is RW XIII, which has various achievements in ecological aspects.

Kampung Kertajaya RW. XIII, which has been the focus of case study is the winner of Green and Clean Surabaya best IPAL (wastewater treatment plant) group in developing category. The settlement that had been built there was also a non-governmental settlement.

### **Physical Aspect**

The condition of settlements in RW XIII is very neat-looking and clean, it also seems livable and comfortable. Most of the houses in this settlements area are a non-governmental permanent home. Some physical aspects that are sufficient and available in Kelurahan Kertajaya Surabaya as a part of its infrastructure including road conditions that are relatively well preserved; because the roads are made of pavement that has been kept clean and orderly by citizens to provide a matching color on the street in front of their respective homes with shades of yellow and green. At the street intersection or crossroads in the village, which generally go unnoticed by the people around it turns out to be given in ornamentation motifs that are painted right on top of the paving of the road intersection.

Sanitation conditions of clean water RW XIII Kelurahan Kertajaya came from taps, which are used for drinking and cooking. Distribution of water taps in the area of the study has been even and distributed to homes well. Electricity and telephone network in this district have been met by the electricity network of the PLN (the state-owned electricity company) where the electrical service has been evenly spread to every resident's house. The telephone network has also been spread well in all

area of this village. The drainage sewer is also functioning well and looks clean.

The drainage system in this area is the source for Wastewater Treatment Plant that is a form of support from Surabaya City Government. With the existence of IPAL (wastewater treatment plant) in this area, the waste water could be reused to water the plants. Domestic waste processing in this area is applied to the unrecyclable items. The residents in RW XIII actively participate in managing their domestic waste. Organic and non-organic garbage are placed in separate bins, the organic garbage that came from the cooking remains are cut into pieces and placed in the composter to be processed as compost (see Figure 1).

Go green movement undertaken by the residents of RW XIII is contributed by the local residents who are actively participated by planting greenery in front of their houses. Various types of ornamental plants from pot plants and plants that are planted directly in the soils decorate their mini-garden in front of their homes. The majority of the residents of RT 09 plant orchids in front of their homes that orchid has become the identity of this RT and thus this RT is known as the “Orchid Village”. In addition, there is also TOGA mini garden near the RW Hall that is managed by the local residents.



**Figure 1.** Composter  
Source: field survey, 2013

### **Social Aspect**

Daily life in a township is very close-related to the social aspect. Social aspects of the community can be very supportive in the efforts to realize ecological city. The various social aspects in question is including the *citizen empowerment* routine activities such as gathering, teaching, counselling, independent crafts, community service, night guards, etc.

### **Economy Aspect**

Independent Business, Many residents of RW XIII perform economic activities in their home, so the house also functioned as a place to look for additional income,

such as for boarding house, shop, cafe, school, place of sewing, and so forth. *Bina Mandiri* is a program that aims to encourage citizens to participate in performing certain activities that can generate profits to support the economy of the people.

*Bina Mandiri* activities include the *citizen empowerment* associations active in household waste recycling process to be used as decorative items. The results of these activities are sold in the bazaar events and SMEs in Surabaya. In addition to be used as decorative handicrafts, dry waste can be collected in the waste bank then each member will have/make accounting on revenues from the sale of waste that has been collected (see Figure 2). Management of waste banks cooperate with *Bina Mandiri* division of Surabaya City Government, the operational and financial management of rubbish bank is handled by the committee of the local residents consist of six people.



**Figure 2.** Waste Bank  
Source: field survey, 2013

### **Kampung Kertajaya in Relation with Green Economy Issue**

One of the implementations of the green economy in this case study village in Kelurahan Kertajaya RW XIII is to empower the garbage to be used again. In this village, the organized management system makes this program run smoothly. Dry and wet garbage can be a commercial aspect. Wet or organic garbage can be turned into compost. We can do this by chopping the rest of the unused materials and put them in a composter. The compost produced can be utilized to fertilize crops. This can increase the amount of greenery in the environment contribute to the reduction of global warming effects.

The management of dry garbage collection is done by summoning the members of the community, which is the resident of RW XIII. They have a member book that is use to record the litter that is sorted and weighed. The rubbish bank community has a total of 6 members that are local residents. The garbagaie is sorted by the members to be sold according to the category determined by *Bina Mandiri* and the money earned from this garbage management will be put into saving that belongs to each member, the amount of the money depends on the weight of the garbage they gave earlier.



Given this reality, the recycle of dry waste such as paper or cardboard made from wood, can reduce the felling of trees and thus lumberjack. Reusing plastic materials can also contribute to preserve the environment, because the plastic production which process creates carbon emissions. In fact this is learning about waste management is all about, it induces a follow-up movement of environmentally conscious efforts. Thus the implementation of green economy can bring benefits.

### **Quality of Life Elements in Ecological Development System in Kampung Kertajaya**

Environment is a combination of physical conditions that include a state of natural resources such as soil, water, solar energy, minerals, and flora and fauna that grow on the land and in the oceans, with institutions that include the creation of human decisions of how to use the physical environment. In the settlement sector, government and community efforts to improve the condition and quality of the neighbourhood has been socialized and run, one of them is in Kampung Kertajaya RW XIII Surabaya.

#### **Air Quality and Pollution**

The biggest factor affecting people's health and quality of human resources is the quality of the physical environment. The second factor is related to people's behaviour and lifestyle habits. The third is the form of health care such as public utilities, waste disposal systems, etc.

Kampung Kertajaya RW XIII is located on the edge of the highway so this area has a very high pollution. Plants grown at the sideways along the road may play a role in reducing the spread of emissions, particularly in the form of gas. Various types of shrubs and trees can reduce the level of nitrogen and sulphur in the air.

#### **Water Resource Quality**

Hydroelectric energy can be harnessed and converted into electricity, and hydroelectric power plants do not produce greenhouse gas emissions. To be able to renew the energy of water in the village Kertajaya, Wastewater Treatment Plant technology is applied to process residual household waste that comes out through the sewers settlements through the filter, which can then be reused for watering plants. The presence of wastewater treatment facilities cannot be separated from the role of government to encourage citizens to participate in order to support the construction of ecological city.

#### **Waste Management Cycle**

Organic waste or dry waste, for example, the remains of leaves to feed the animals can be used for manure or fertilizer. Kampung Kertajaya RW XIII utilizes existing waste in the form of organic waste to be processed into fertilizer.

## **Greenery Quality**

Greening in a small scale, for example planting greenery in the yard is associated with greening ecological functions in general, so as to help improve the physical quality of the urban environment that has a region of high population density. Greening the yard has hydro ecological function because it helps slowing the fall speed of rain water so that the soil surface is not easily broken. Yard also has the function of micro-climatology ie plants around the home can reduce the hot sun and can reduce solar radiation.

In RW XIII, Kampung Kertajaya almost every citizen has a green lawn at the front of the houses which are clean and decorated by flowers so it looks neat, beautiful, clean and refreshing. Greening is done by utilizing a relatively narrow area around the house, planting vegetation, closing the gutter that is then designated to place potted plants.

## **The Role of Environmental Village as A Tourism and Heritage Village**

Kampung Kertajaya RW XIII Surabaya is a kampung settlement that has no heritage buildings, thus the discussion will be focused on cultural and heritage tourism a sustainable strategy (Raymond A. Rosenfeld) where culture and tourism is one of the efforts in sustainable development. An approach in which a certain place is encouraged into becoming a tourism destination can be realized if that place has a valuable asset as well as valuable historical, cultural and environmental conditions.

Kampung Kertajaya RW XIII Surabaya is one of the winners of Surabaya government event in support of sustainable development, namely the Green and Clean, Kampung Kertajaya is also a pilot village in an effort to be eco-friendly village and applying the principles of green architecture. Additionally Kertajaya village is becoming tourist village with lush greenery throughout the village supported by well Water Treatment Systems and waste management system, sufficient energy utilization with the active participation of community and citizens who are aware of the importance of a healthy environment.

As evidence, this village often gets rewards and often gets a visit from the mayors of ASEAN who came to observe the unique waste treatment systems and waste bank owned by residents as well as the utilization of waste into compost and sewage treatment.

## **Construction System and Sustainable Materials in Kampung Kertajaya Surabaya**

The relation of sustainable development and construction systems and sustainable or friendly material originated from the concept of green architecture that is currently widely used as a concept to design. Green architecture is an approach to building plans that seek to minimize the various influences that can harm human health and the environment.

Green architecture is a step to preserve the earth as a human habitation to minimize the destruction of nature and the environment. Green architecture approach

begins with the concept of sustainable development that has a sense of development that can meet the human needs of the present without compromising the potential of future generations to meet their own needs. The related aspects of natural and artificial sustainable development include economic, social, cultural and institutional energy use. One embodiment of sustainable development can be achieved through the application of green architecture. Embodiment of green architecture principles in a better environment by Brenda and Robert Vale (*Green Architecture Design for Sustainable Future*: 1991), there are several principles of green architecture: Conserving Energy (energy conservation in buildings to maximize natural energy), Working with Climate (buildings designed in harmony with climate and energy sourced in nature), Minimizing New Resources (buildings designed to minimize resource use and maximize the potential of new recycling), Respect for Users (buildings designed according to the interests and needs of its consumer), Respect for Site (the building is designed in accordance with capacity of the land and does not damage the existing environment), Holism (the building is designed in an integrated manner to the principles of green architecture development other).

Broadly speaking, the principles of green architecture is divided into three; energy efficiency, green construction, and green materials (lighting systems, electrical, mechanical, water, etc.), as well as the anticipation of global warming (waste management, provision of green space, etc.).

Sustainable construction and materials create a healthy building is manifested in the application of the concept of air treatment (either indoors or outdoors), water treatment, sewage treatment (reduce, reuse, recycle implementation), as well as the utilization of the energy contained in the natural environment. Explanation of case studies related to the Kampung Kertajaya Surabaya construction system and the application of sustainable material can be seen in the physical aspects of the village.

### **Air Treatment**

The effort in creating a healthy environment is supported by the presence of fresh air and a healthy environment free of pollution. Go green movement undertaken by the residents of RW XIII is contributed by the local residents who are actively participated by planting greenery in front of their houses. Various types of ornamental plants from pot plants and plants that are planted directly in the soils decorate their mini-garden in front of their homes. The majority of the residents of RT 09 plant orchids in front of their homes that orchid has become the identity of this RT and thus this RT is known as the "Orchid Village". In addition, there is also TOGA (herbal plants) mini garden near the RW Hall that is managed by the local residents.

Most houses in Kampung Kertajaya have applied ecological principles with the green movement that they perform in their surrounding. However, beside the greening or greenery, they also need sufficient openings to produce fresh and healthy air in each house. The majority of houses have already made or had sufficient openings, yet several of them have not been applying good openings due to the limited area or insufficient land and the population density in the neighborhood.

## Water Treatment

One of the essential sources of human life is water, thus healthy clean water can cause healthy life. Source of clean water in RW XIII Kelurahan Kertajaya came from taps, which are used for drinking and cooking. Distribution of water taps in the area of the study has been even and distributed to homes well. The drainage condition is well, it is also functioning well. The drainage is closed with pavement that the water flows in the drainage. The drainage system in this area is the source for Wastewater Treatment Plant that is a form of support from Surabaya City Government (Figure 3). With the existence of wastewater treatment plant in this area, the water waste can be reused to water the plants.



**Figure 3.** Wastewater Treatment Plant (IPAL)  
Source: field survey

## Waste Management

Human daily life inevitably produces waste in the form of solid or liquid. Waste if not treated properly will turn out to be a source of disease for human life. Waste is residual from human's daily life's disposal that can potentially pose dangers in human's life.

Organic waste or dry waste, for example, the remains of leaves to feed the animals can be used for manure or fertilizer (Thohir in Anggraini, et al, 2012). Kampung Kertajaya RW XIII utilizes existing waste in the form of organic waste to be processed into fertilizer while the non-organic waste is sold to be reprocessed again.

## The Participation of Society in Realizing Ecological Kampung

Community empowerment has become a popular term in the community these days. Community empowerment is one method of movement used in running community development programs, in the economic, social, cultural, educational, health, or a combination of all these aspects.

Various activities of the residents of Kampung Kertajaya RW XIII who had earlier described the social aspect are the example of manifestation of community empowerment that aims to achieve a sustainable society. With the enthusiasm and participation of the citizens or the residents, the expected empowerment initiated by the government and citizens can run continuously, independently, and thrive, and does not depend anymore to the budget, donors, or the initiator of the program itself.

Community development through community empowerment method would be much more beneficial and have long-term effect than government assistance programs that are oriented to the physical appearance alone. Physical development is still required, but community development that is only performed in such extent will never produce a society that is independent, empowered, and prosperous.

In achieving the ecological Kertajaya village, cadres in the neighborhood seek to gather village communities in routine activities that have been agreed to and then applied to everyday life. The role of the environment in the village cadre is not just limited to motivating people to care about the environment, but also managing a range of environmental management systems including financial management system of the program "Rubbish Bank" which will be explained in the following discussion. With the participation of citizens based on environmentally conscious thoughts, Kampung Kertajaya can grow as a healthy and beautiful village.

Villages in Surabaya have a strong character of mutual cooperation, so that with the mutual agreement of the awareness program, the residents of Kampung Kertajaya gladly run it with enthusiasm. The high form of tolerance makes up the character of the village that cares about the environment so as to give contribution in the attempt to realize eco city. The positive impact of caring villagers in addition to providing ecological benefits to the neighbourhoods and the surrounding environment is also make citizens healthier physically and psychologically.

An activity of community-based development is a form of actual development (Silas, 2012). A city development is better be done by both the community or society and the government. In the course of environmentally friendly program run by the residents of Kampung Kertajaya, Surabaya city government gives a token of appreciation in the form of rewards "Beautiful Surabaya Green and Clean". The award is an appreciation of the environmental conditions in Kampung Kertajaya Surabaya settlements that are concerned about the preservation of the environment and the health of the environment. Kampung Kertajaya won the award in growing village category.

The potential of this village in terms of environmental awareness can open a variety of new jobs and the achievements of this village can make this village a tourist village that has good future prospects. The achievement cannot be separated from the role and participation of the residents of Kampung Kertajaya, therefore these achievements should be maintained until the next generation to meet the challenges of urban development in the future.

The process of developing this village into a tourist village proves that the community members were able to develop the village into a more useful place. It also indicates that the members of the community have a potentiality in running business activities and fulfilling their needs. This can have a positive impact on the economic aspects.

This village is able to attract visitors from different regions, so it can be used to make business profit pursued by the village community to establish entrepreneurship in Kampung Kertajaya RW XIII. Armed with a willingness to progress and develop, accompanied by the ability to form knowledge, they are able to run their business on a small scale. Indirectly it is an entrepreneurial activity. It is essential to keep developing the small-scaled business. For example, many residents of RW XIII conduct economic activities in their home, so the house also functioned as a place to look for additional income, such as for boarding house, shop, cafe, school, place of sewing, and so forth. With the increasing numbers of visitors who come to the village can also increase their incomes on home-made effort.

The important thing is how the residents or community in RW XIII are responsible of their role in managing the potential available in this area. Through environmental management activities, residents have the opportunity to process waste into marketable products assisted by *Bina Mandiri*. *Bina Mandiri* is a program that aims to encourage citizens to participate in and perform certain activities that can generate profits to support the economy of the people. In this case *Bina Mandiri* provides an opportunity for communities to manage their own business in the region so as to explore the potential of natural resources properly and being responsible of it. The management of the business based on the kinship between members of the community in RWXIII.

The activities include the household waste recycling process to be used as decorative items. The results of these activities are sold in the bazaar events and SMEs in Surabaya. In addition to be used as decorative handicrafts, dry waste can be collected in the waste bank then each member will make accounting on revenues from the sale of waste that has been collected. Management of waste banks cooperate with *Bina Mandiri* division of Surabaya City Government, the operational and financial management of rubbish bank is handled by the committee of the local residents consist of six people. Almost every citizen participates in this activity. It is a noble thing to do, because through this activity, the community can help improve the economy sector by utilizing the unused products.

### **Further Development of Kampung Kertajaya**

Kampung Kertajaya RWXIII had done well in preserving the environment, however there is still lack in the implementation of programs or sustainable development that was carried out by this village, there is not enough follow up from the innovation and the lack of maximization of renewable energy. The renewed energy shall be developed further in order to give more benefit. The number of composters is too few compared to the number of homes in this village. They should have added the quantity of the composters. I.E. each home must have one composter that the product can give maximum benefit to the owner and the rest can be resold. This can help improve the economic condition of the residents. In addition, the existence of the wastewater treatment plant in this neighbourhood can help the residents to process their water waste to be reused to water the plants. The so called innovation should be studied and developed further, so that the people can learn the waste-water treatment system from wastewater treatment plant so that the system could accommodate each

house in the neighbourhood to be used again at least for watering plants or flushing the toilet.

The village road is relatively narrow, and the drainage sewer is too small so they need a solution to prevent flooding and water logging. One of the solutions to these problems is to implement a *biopori* system. This may reduce the possibility of flooding and water logging. Moreover, since this village is located in the heart of the city, the village is dense-populated and lack of green open space. There should be a green open space which can be used for a public facility owned by the village to accommodate social events and community gathering outdoor. In addition to its purpose to accommodate social activities, green open space can also serve as an absorber of carbon dioxide and able to absorb rainwater into the ground.

## CONCLUSIONS

The concept of Ecological City is now starting to be applied to reduce the global warning. In this report, the discussion of ecological city (ecocity) concept and the analysis of case study can be summarized as follows: first, application of the concept of ecological city (eco-city) starts from the smallest scope of a city that is home; second, a support program of the local government to invite the public awareness of the environment (eg Surabaya Green and Clean program); third, in terms of physical aspects, supporting facilities can create a healthy environment (trash, wastewater processing, Greening, etc.); fourth, in social aspects, public awareness in creating a healthy environment can establish a sustainable society; lastly in economic aspects, the implementation of ecological city concept can improve residents' economic condition, for instance, the rubbish bank that is owned by each family.

From various studies on ecological system that has been done in the settlements in Kampung Kertajaya RW XIII Surabaya, we can conclude that in the attempt of realizing an eco city, this settlements have made contributions as the following: supporting the improvement of human's health, the activity of the residents that is integrated into sustainable development, can be a cadre of settlements that have high environmental awareness, it is also expected to continue up to the next generation.

In order to make Kampung Kertajaya a sustainable settlement, the village can make a good use of technology application so that the village can be advance. The maximization of the current innovation is also required in order to support the advancement.

## ACKNOWLEDGEMENTS

This work was a summary of Sustainable Development educational subject assignment which held in Department of Architecture ITS Surabaya. We are grateful to Prof. Ir. Happy Ratna S. and Ir. Purwanita Setijanti, for their advice and guidance during the writing process of this work.

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