ECO-CITY STRATEGY IN INDONESIA[1]

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ABSTRACT

The purpose of this paper is to analyze the current condition of "Eco-city", and how to best implement it in a developing archipelagic country such as Indonesia. Because "Eco-City" is the next feasible step in realizing a sustainable city, striking the perfect balance between environment and human in a city is the key to achieving an "Eco-City" strategy.

Key Words: Eco-City, development, strategy, Indonesia, sustainable, city, environment, human.

ABSTRAK

Tujuan dari makalah ini adalah untuk menganalisis kondisi terkini "Eco-city", dan bagaimana cara terbaik untuk menerapkannya di negara kepulauan yang sedang berkembang seperti Indonesia. Karena "Eco-City" adalah langkah yang layak berikutnya dalam mewujudkan kota yang berkelanjutan, mencengkeram keseimbangan sempurna antara lingkungan dan manusia di kota adalah kunci untuk mencapai strategi "Kota Ramah Lingkungan".

Kata Kunci: Eco-City, pengembangan, strategi, Indonesia, berkelanjutan, kota, lingkungan, manusia

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I. INTRODUCTION

Humans have been living on this planet for many centuries and for multiple generations. Alongside, human knowledge has evolved into a better intelligent animal to find ways for a better living standard for the society, and contribute to the only planet that we have. Researches and scientist have gathered and implemented many strategies to make development for the state and planet to compensate the damages that we have caused ourselves; one of the ways is adopting 'Eco-City' strategy (King, 2018).

The science of environments has contributed a lot towards our lives as humans. The field of study has come a long way from being just another new discovery, into becoming a fully-fledged knowledge on its own. One of its latest and most notable contributions to human society is the "Eco-City" strategy. "Eco-city" strategy is the term for an environmentally friendly city with the ultimate goal of eliminating carbon-waste, producing a steady stream of sustainable energy, and lastly to exists without harming nearby environment and the people per se. Although, there are always benefits and challenges in adopting and developing 'Eco-city" strategy (King, 2018).

The benefits of Eco-City strategy are located in its environmentally-friendly aspect. In that it's zero carbon characteristics and sustainable energy reliance helps to combat environmental change, and slows down process of global warming and the likes. Also, it provides a generally healthier environment to the citizens living there. The fact that it also runs on sustainable energy proves the fact that eco-city is self-reliant.

Although the benefits of "Eco-city" strategy is numerous, and is generally in every way better than a regular built city. There are many disadvantages to implementing it in our current society, such as the fact that "Eco-city" is very resource demanding, to the point that only developed country can implemented it completely. In addition, "eco-city" is not easily implemented over currently built cities around the world, and there are many more.

At the end of the day, "eco-city" strategy offers up a lot of possibilities for current society, but in the process of implementing it many parts of the world may encounter difficulties, although with the recently observed climate changed and global warming, it may present the best way possible to prevent further harm to the environment.

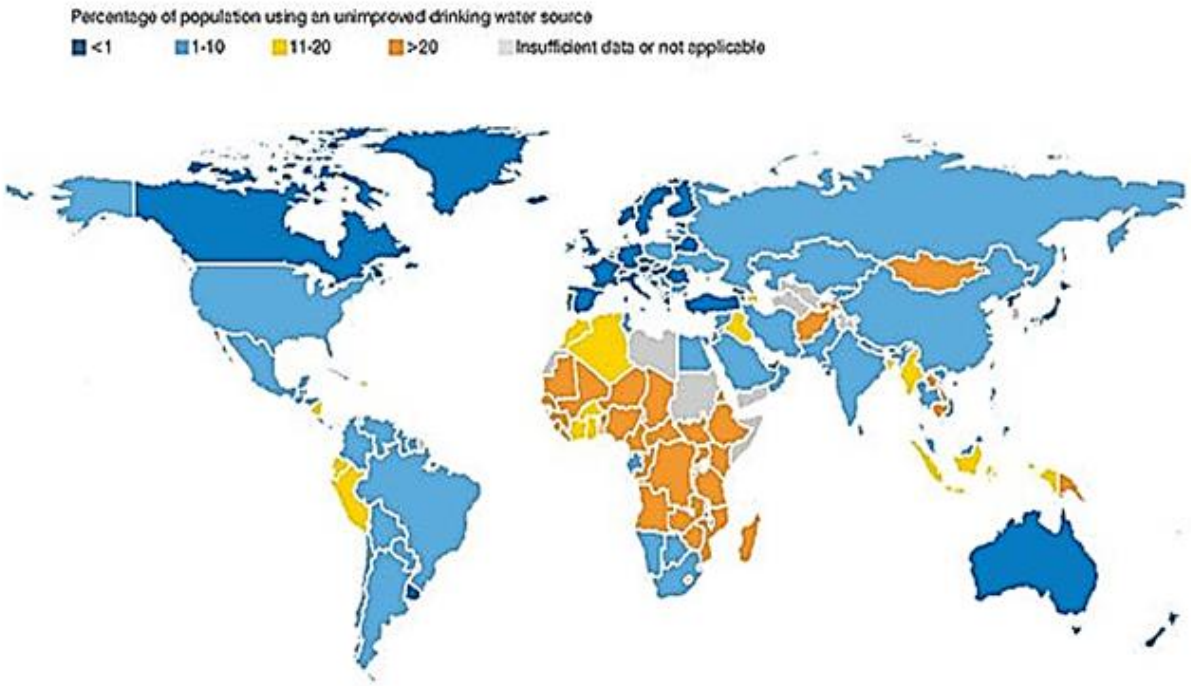
I.1. PROBLEM IDENTIFICATION

The condition of the world has changed a lot over the years; it was significantly different from what it was around a hundred years ago. Many new innovations, discoveries, and improvements have been made, resulting in a deep impact on human life on a daily basis globally. The changes to our daily life brought upon by these changes has also brought many impacts to our environment, although sadly most are negative impacts, such as the radical change in lifestyle has significantly harm the environment in that in our daily life we use technologies that produced huge amount of carbon footprint which is essentially bad for the environment, and many others.

In developing countries there is the problem of the amount of waste being produced increasing over time while the amount of waste recycled is not enough to keep up with the ones being produced, this presents a problem towards the sustainable lifestyle of humans, the waste management of these countries are not acceptable, and that more needs to be done to improve it. According to "The Guardian", about a million plastic bottles are purchased per-minute on a global scale, and this number is expected to grow into a staggering half-a-trillion

plastic bottle purchased annually by 2021, this leads to the need of a new technological solution to handle the matter (Sandle, 2018). To have a bit of perspective, just imagine the growth of population in the whole world, as shown in the illustration below, whereby billions of people have to strive for drinking water.

Figure 1: Percentage of Population Using an Unimproved Drinking Water Source



Source: (Slaymaker & Bain, 2017; Anantadjaya, Rahmadani, Zen, Nawangwulan, & Rachmat, 2019)

Another environmental problem that is killing the world is pollution (Anantadjaya, Rahmadani, Zen, Nawangwulan, & Rachmat, 2019). This causes death and diseases in the world, three times the deaths caused by AIDS, tuberculosis and Malaria combined in 2015, according to a sweeping global study published the "Lancet Medical Journal". Furthermore the "Lancet Commission on Pollution and Health" blames pollution for an estimated 9 million premature deaths, they concluded that pollution "endangers the stability of earth's support system, and threatens the continuing survival of human societies". And that most of the unfortunate victim of pollution tends to be coming from the low and middle income of society.

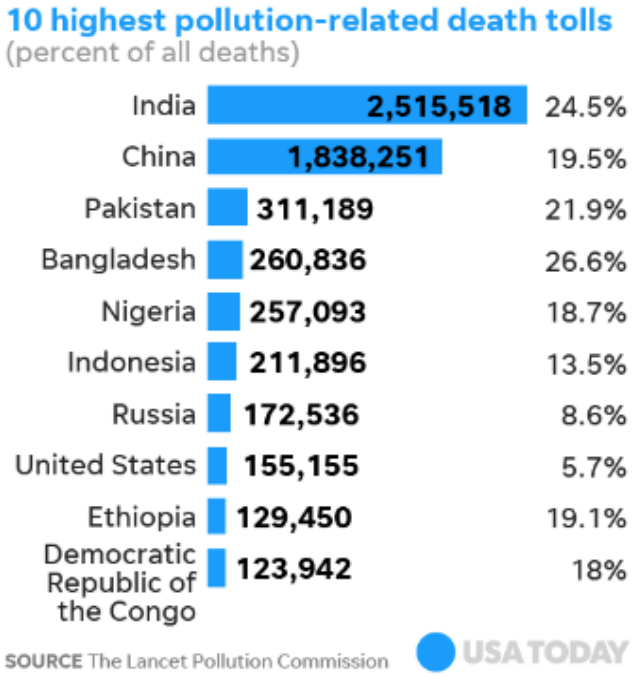
The following table is a simple chain reaction on the supply and demand for water with the increase of population and the spill-over effects. The left column, it shows the demand pressures due to few notable elements, such as; population growth, which leads to more energy demanded, economic growth, climate changes due to green-gases emissions, policy and regulation modifications toward higher environmental standard. On the right column shows the mismatch of space between the storage for the body of water and residential, commercial, or industrial zones/areas, the worsening of the quality of the environment, which impact the quality of water (Anantadjaya, Rahmadani, Zen, Nawangwulan, & Rachmat, 2019).

Table 1: Supply and Demand Pressures on Water Availability and Use

Demand Pressures	Impacts of Water Stress	Supply Pressures
Population Growth • Increased urban use • Increased demand for food **Economic Growth** • Increased urban water use • Increased industrial water use • More water-intensive diets **Energy Demand** • Use of food crops and crop land for biofuel **Climate Change** • Increase crop ET requirement **Policy/Regulation** • Deteriorating infrastructure (lack of investment in water) • Higher environmental standards	Localized ground water overdraft Pressures on ecosystem Economic/political conflict Risk for potential growth!	**Spatial/temporal mismatch** between supply and demand **More expensive supply curve** for new waters **Continued water quality deterioration** **Climate change pressures** • Increasing variability • Extreme events jeopardize infrastructure and water supply reliability • Declining renewable water resources (in some cases)

Source: (Ringler, 2012; Anantadjaya, Rahmadani, Zen, Nawangwulan, & Rachmat, 2019)

Figure 2: Ten Most-Polluted Country on Earth



Source: (Staglin, 2017)

In a graph provided by the Lancet Pollution Commission, India has the highest percentage of pollution related deaths amongst the rest of the world, with China and Pakistan not far behind, the commission in the end recommends the increasing and focusing the funding and the international technical support dedicated to pollution control and monitoring, in the hopes of preventing further damage (Staglin, 2017).

Indonesia is currently becoming more and more aware regarding the importance and benefits of having eco-city throughout the nation, it is becoming evident as seen from recently held UNDP event on the 20th of October, where Indonesia's most prominent museum, the "Museum National" was turned into a Sustainable Development Goals workshop which includes engaging talks, meet-ups on how to adopt a green (Eco-friendly) lifestyle, as part of UNDP's Social Good Summit 2018 (Soetjipto, 2018).

I.2. PURPOSE OF STUDY

The aim of this paper is to analyze the probability of application regarding "Eco-City" strategy in Indonesia which is aimed at the rise of many sustainable cities in Indonesia. Indonesia is an archipelagic country located in South East Asia, it is situated in a very strategic location between two oceans and two continents, making it a highly valuable place for international trade. Indonesia also houses one of the world's largest population, therefore the presence of ecological friendly cities in this country is very important as it will impact the sustainability of the nation's society and significantly reduce the ecological footprint/carbon footprint that will be left on the area.

II. STRATEGY FOR INDONESIA

II.1. INDONESIAN TERRITORY

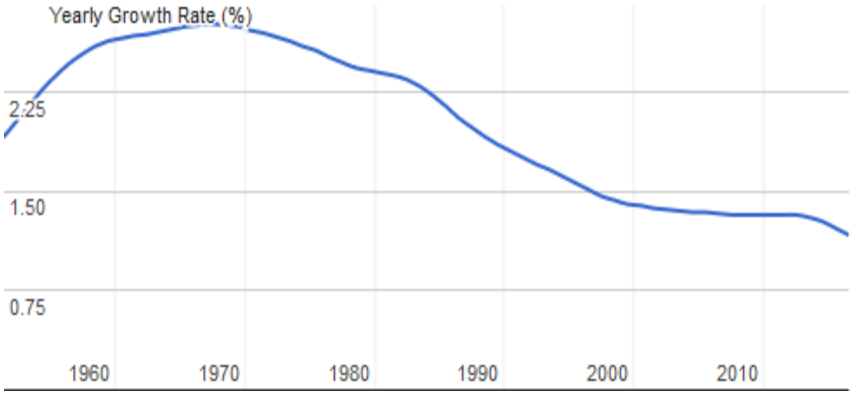
Indonesia is made up of around 17,000 islands with 1.9 million square miles of land, effectively making it the 15th largest country in the world, with a population of 266.79 million (as of 2018), and most of them (around 56.7%) residing in the island of Java, having a population density of 140.08 individuals per square kilometer (World Population Review, 2018).

Having a population and territory of that size will definitely result in Indonesia having a big "Ecological Footprint", which measures the amount of resources consumed and the wastes produced by combining the total usage of energy, settlement, timber, food, fiber, and seafood, which is measured in "bio-capacity", should a country requires more energy than their ecosystem can provide then they are having a "ecological deficit" (Network, Global Footprint, 2018).

The annual growth rate of Indonesia's population between the year of 2000 and 2010 stood at an average of 1.49%, with the province of Papua attaining the highest number of growth of around 5.46% in overall, and Central Java experiencing the lowest at 0.37% in overall (Indonesia Investment, 2017).

The Indonesia government's statistics agency (BPS), only conducts study on the total size of Indonesia's population once in a decade, and the last time they had done so was back in the year of 2010, back then Indonesia's total population was estimated to be around 237.6 million people, although a more recent estimation has suggested it to be around 260 million (Indonesia Investment, 2017).

Figure 3: Annual Population Growth of Indonesia



Source: (Indonesia Investment, 2017)

II.2. TECHNOLOGY

In this modern era, we have many technology and technique that can be implemented to build and preserve human civilization, technology also a factor that help the improvement of the effort to build an ecocity. The technology that been use by all nation to build ecocity in Indonesia are the sun panel to reduces the uses of fossil fuel-based energies, plastic and trash burner and processor to make electrical energy from any garage that we produce and the last but not least the water purifier that use to increase the percentage of clean water that can be used by us.

II.3. MAPPING

Maps have been an interesting topic that humankind eager to explore since prehistoric times.

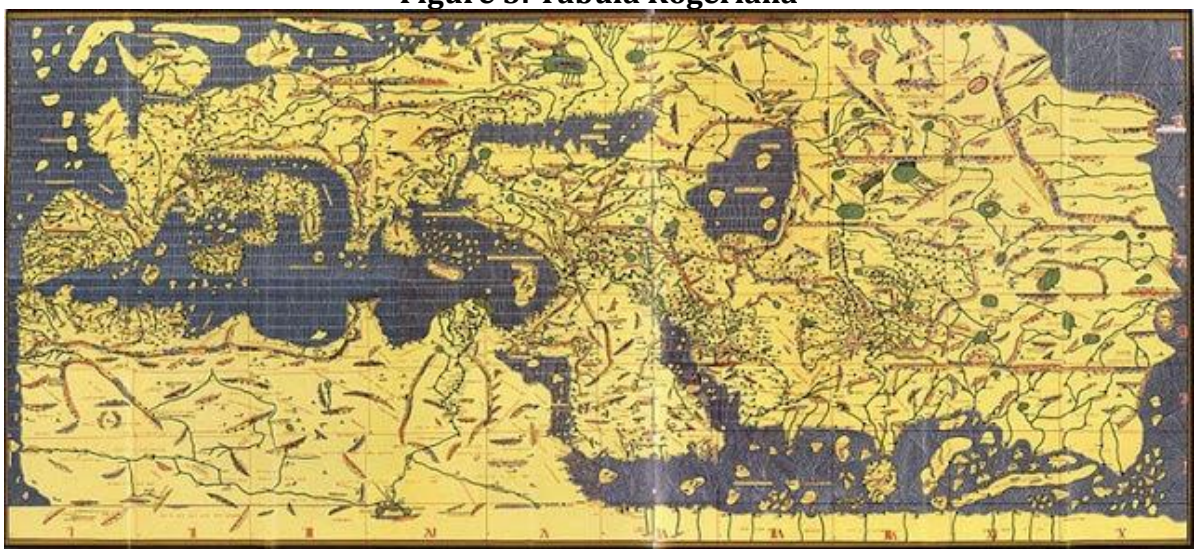
Figure 4: Recreation of Ptolemy's World Map

Source: (Brooke, n.d)

Dated back since 6100 – 6300 BC by old Egyptians on papyrus. Now, a mapping is still growing and the field itself now called cartography. The one who vastly improved

cartography and develops an understanding of this particular topic is Greek civilization. People of Ptolemy, Herodotus, Eratosthenes, and Anaximander, have a remarkable influence on western sciences today, particularly in the study of Geography and Earth Science. Later on, Ptolemy wrote a map that implements a new concept and system called “latitude” and “longitude”. This system is still used today by cartographers (Dempsey, 2011).

Figure 5: Tabula Rogeriana



Source: (Dempsey, 2011)

Modern mapping began to take off after the industrial revolution. Railroads expanded rapidly thus making travels cheaper and faster. This led to more accurate and wider maps, the maps also leave only facts and design it more beautiful. Nowadays, technology help to expand maps and adding more info. Technology such as GPS and remote sensing add more depth to the maps while framework like GIS is to help to map a new area (Dempsey, 2011).

There are seven steps to do eco-city mapping. These steps are required to produce a comprehensive and accurate map. The first step produces local natural history map this is important to know the area first before making it eco-city, the second one is to establish walkable vitality enters to ensure easy access to the vital places such as hospital and schools. The third step is balancing urban and green area. Fourth is to identify key gateways and views. Fifth is to render vertical cross sections so that people can see it in 3d and get a much better picture. The sixth step is to provide legend on the map, the purpose of this is to give details on the map. The last one is adding a scenario map since there are many ways to build eco-city (Ecocity Builders, 2009).

II.4. PROGRAM

The ecocity program were not a new concept that just born yesterday, this concept has been created in 1713, by Von Carlowitz that have viewed forestry and its sustainability very important for the balance of city growth itself (GardenVisit, 2017). Then the concept of ecocity developed and try to implemented by Bruntland Commission from Norway in 1987, and its defined the sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987; Kono, 2014), this definition help to answer the long questioned of definition of development itself to help the sustainable development that been doubted by some expert in the field itself (GardenVisit, 2017). After some years, the concept itself been developed and started to panned in 1992 by Richard

register, with his newly founded group "Urban Mills" to achieve the first ecocity in the world with the first ecocity conference in Berkeley, California in 1990 (GardenVisit, 2017).

Ecocity program have the purpose of ecocity builder such as Utilizing ecological urban planning, design, ecology, education, advocacy, policy and public participation to build healthier cities for both people and nature, Ecocity Builders' early years were build and much inspired by a number of local projects in the San Francisco East Bay, US with the first project "Codornices Creek Project" in 1994, the project itself have goals, and that to remove the water channel from its cement culvert along the Albany/Oakland border to create a mile-long park signified one of the earliest daylighted and restored creek beds in the United States. This project help to define the ecocity planning and program overtime and help its to perfect itself.

Figure 6: The Codornices Creek Project

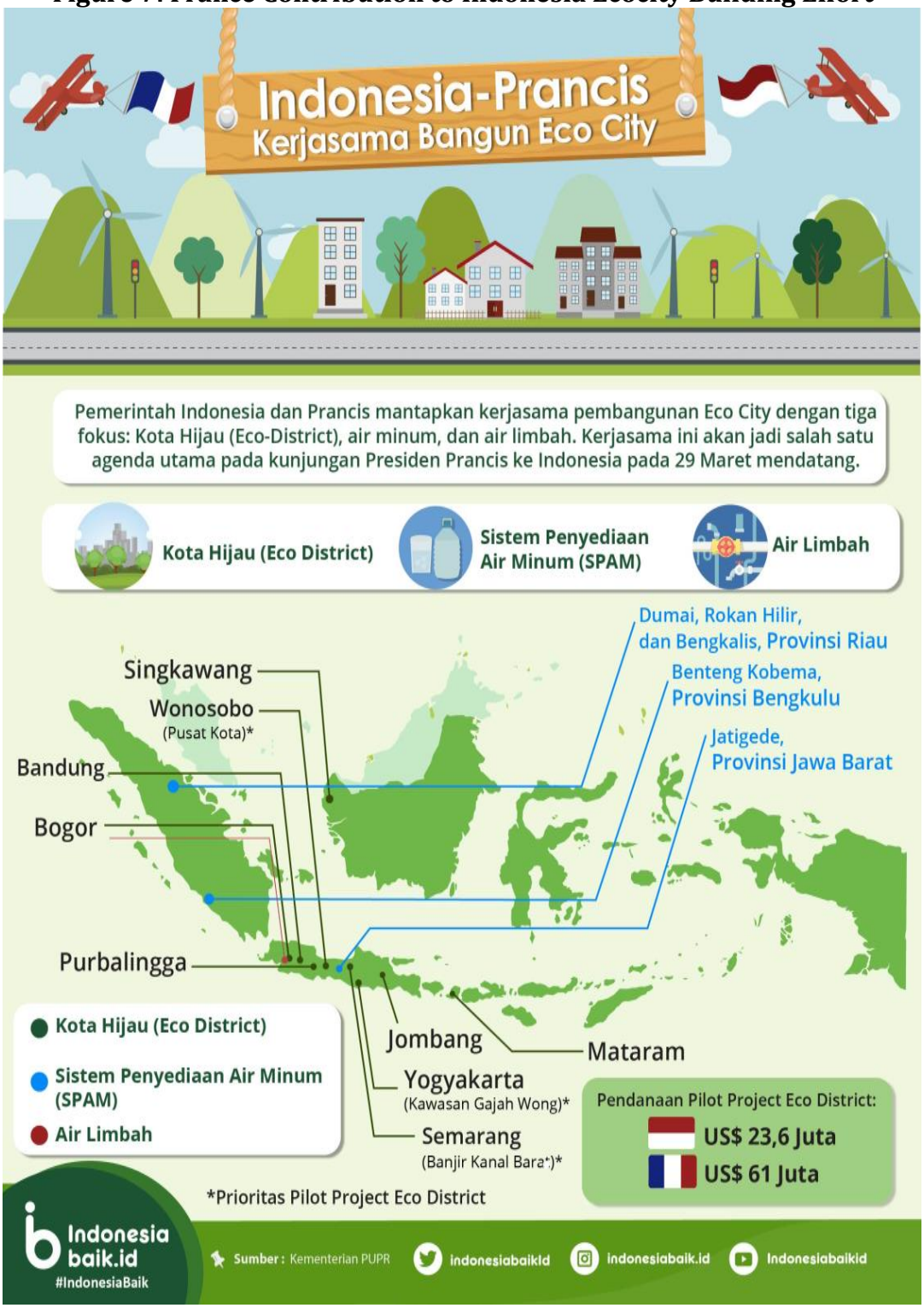
Source: (GardenVisit, 2017)

In Asia itself, Japan was the first nation that plan to have ecocity program in the future, and that was been planned and implemented by them since their rapid economic growth that made their city mostly populated by industries areas, because of that in 1996 they started to plan to implement green tourism in three most polluted city in Japan, Minamata, Kitakyushu, and Kawasaki (Low, 2013). In early 1997,

Minamata has transformed itself from being a polluted city to a green tourism destination and soon its follow by Kitakyushu City that embraced an ecocity strategy in 1997 to promote a structural shift away from heavy industries to green industries, Kawasaki also followed those two city in the same year, and the same action been implement Minamata city in 2001 (Low, 2013; King, 2018). For Indonesia itself, the program of ecocity were planned in 2012 following china step that started to plan for the ecocity building around the same years to catch up of Indonesia lateness of realizing of ecocity trend in international society that affect some trade rules such as the carbon emission laws from EU that plan to implemented in 2013 (Institute for Global Environmental Strategies, 2013). The ecocity program in Indonesia itself has been help and fund by Japan city government of Kitakyushu City to help Indonesia first city that tried to implement the ecocity, Surabaya. The implementation of ecocity itself been massively implemented in many cities in Indonesia last year, after France agree to help Indonesia to build and modify some City in Indonesia into

ecocity and gave Indonesia fund for $61 million while our government just provide $23,6 million for ecocity building (Hapsari & Fauzi, 2017).

Figure 7: France Contribution to Indonesia Ecocity Building Effort



Source: (Hapsari & Fauzi, 2017)

The ecocity program still continued by Indonesia government, especially after some city have succeed to implemented ecocity on their city such as Surabaya with their eco friendly policy that implemented cost of bus fare ticket either regular money or the plastic trash that can be recycle into new plastic and reduce the plastic waste in Surabaya itself

(BBC, 2018). The achievement of ecocity in Surabaya is the increase of green area in Surabaya from 2,45 in 2014 into 6,5% in 2018 (SNA Media Club, 2018).

Figure 8: The New Green Space in Surabaya

Source: (SNA Media Club, 2018)

The development of ecocity in Indonesia are mostly does by government without any centralization planning and program itself unlike other nation that plan their ecocity program for across their territory, and Indonesia ecocity planning are unorganized and tend to be independent planning from each city, and the ecocity standard that standardized in the world never been followed 100% by every city in Indonesia, and each city never focused itself to build and developed itself into ecocity and most of them focused on other different subject such as the city economic development, tourism development, and many else. Despite still lacking International standard of ecocity, Surabaya makes the most successful city in Indonesia other than all of city in Indonesia. The ecocity planning of our city itself still dependent with Japanese and France models that are take a large part in the planning and building itself.

It can be hypothesized that if Indonesia centralizes the ecocity planning in government, such as; what Malaysia do to their ecocity program that going on there, the Kuala Lumpur region been transform into integrated pack of sustainable city zone that had ecocity friendly program implemented in every single meter of them. We will achieve the efficiency of centralized planning and can control the quality of the program itself in each city in Indonesia so the process of the program itself may have consistency and high successful rate.

When people talk about the ecocity in Indonesia, it can be seen the successful story of Surabaya that had the highest rate of ecocity development in every Indonesia cities are soon to follow Surabaya and Malang. However, first, it is crucial to look into Surabaya implementation of the Indonesian-based ecocity. The effort that Surabaya city government take are expanding the green area that build in public place, sterilize water in some river in Surabaya, and try to implement some ecofriendly policy in Surabaya society.

The ecofriendly policy itself from the government start to be implement in last few month ago. One of the ecofriendly policies is the plastic bus fare for city bus, this soon will spread to other transportation such as angkot, ojek, or the taxi itself can be implemented this policy under Surabaya city government policy. As people look at some cases, it can be evaluated the effect of centralization of ecocity planning trough out all neighboring countries. The result of that centralization is the consistency of every ecocity that been built and the quality of its where preserve more, but Indonesia government not yet implement this into a real action and still does not put more attention and effort to this issue.

III. CONCLUSION

With the above-mentioned analysis and evidence, it can be concluded that the ecocity building in Indonesia still lacking of progress and consistency. The progress remains invisible. There has been a lack of centralization and funds committed into such projects. Nonetheless, the government of Indonesia may have ignored and decided to pay little attention. This may have been also the lack of sense of urgency though the EU sanctions of pollution are closing-in in about 2 years. Failure to comply may endanger Indonesian efforts on international trades, particularly with the EU counterparts.

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