Green economic based on low-carbon development on small islands

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Abstract. Global warming and climate change are having an impact on human and the planet. This occurs worldwide due to an exploitative economy, which does not consider the degradation of natural resources and the environment. Damage to terrestrial ecosystems in small island areas has a direct impact on the destruction of marine ecosystems, such as coral reefs, seagrasses, and another biodiversity. The most current devastating impact is the emergence of the “Covid-19 Pandemic”, which shows that so far humans have adopted an individualistic way of life that ignores their environment. This analysis is carried out through a literature review of the research results and scientific discussions that have developed so far. The results of the study show that if the economy continues to run as it is now, the Earth will continue to be in crises such as floods, extreme weather, rising sea levels, food shortage, and outbreaks of more viruses. Changes in paradigm and human behaviour are needed, not only from the government as the main actor of development but also support from the entire community. Science and innovation that are currently developing a change in development towards the ecological-economy, environmental economics, which is currently known as the “Green Economy Model” is already covered by controlling global warming and climate change. The transformation from an Exploitative Economy to a Green Economy has developed in the concept of Low Carbon Development and Build Back Better as part of the Sustainable Development Goals (SDGs), which needs to be formed in an integrated manner as a concept for Sustainable Small Islands Development and bring welfare for the community.

Keywords: Green economy, low-carbon development, small islands

1. Introduction
Global warming and climate change are already impacting humans, biodiversity and this planet, and are occurring around the world as a result of the world's exploitative economy. An economy that does not consider the degradation of natural resources and the environment [9]. As a result, Indonesia is faced with an environmental crisis that must be resolved immediately due to global warming and climate change, such as air pollution, clean water crisis, forest destruction, soil pollution, soil erosion, garbage, floods, landslides, river pollution, and damage to other terrestrial ecosystems. A direct impact on the destruction of marine ecosystems, coral reefs, seagrass, and biodiversity. The environmental crisis’s impact on natural resources, human life, economy and food [16, 9]. Furthermore, according to Czikkely et al. [12] , there are ten main problems due to environmental damage on the planet earth, which are: population explosion, climate change, degradation of biodiversity, disruption of the nitrogen and phosphorus cycle, water supply, ocean acidity, pollution, the damage of the ozone layer, overfishing and deforestation. A very devastating impact today is the emergence of a new virus that threatens the world today, called "Covid-19". Through COVID-19, Planet Earth provides a lesson that
so far, humans have adopted an individualistic way of life that ignores their environment. If the economy continues as it is today, the Earth will continue to be in crisis after crisis, such as floods, extreme weather, rising sea levels, failure of food supplies, and more viruses.

Indonesia, an archipelago country that is very vulnerable to environmental damage, global warming and climate change, has committed to reducing gas emissions by 29% on its own and can be increased to 41% with foreign assistance from Business As Usual (BAU) by 2030. Greenhouse gas (GHG) reduction in the green economy concept, must be applied in all development sectors, especially in the land sector. UNFCCC decisions on REDD + (reducing emissions from deforestation and degradation) that have been planned and developed to become the main direction in the concept of development in Indonesia [8, 2, 4]. Centralised and exploitative economic development in Indonesia has resulted in damage to the mainland natural resources of small islands, coasts and the sea which has caused poverty for most of the community and has even triggered the development of new microorganisms such as the corona virus which is endangering the world today. Despite this predetermined commitment, it has not been fundamentally implemented in national and regional development planning, everything is still sectoral, especially now that everything is still concentrated on handling Covid. Therefore, the concept of renewal of development after Covid-19 must undergo a fundamental renewal.

Changes in paradigm and human behaviour are needed, especially the government and the main development actors supported by the whole society. This is not easy because the concept of sustainability has been developed for a long time since the world meeting in Rio in 1992, which resulted in various conventions but is still difficult to implement. Due to the economic growth as well as science and innovation which are far developed, it is urgent to have changes such as ecological-economy, environmental economics, which can be packaged in green economy lessons that have been covered by controlling global warming and climate change. The foundation that is packaged in current development is Low Carbon Development which is part of the Sustainable Development Goals (SDGs). The 17 integrated development goals have answered the goals of environmental sustainability and welfare which have a positive impact on the restoration of the planet earth. Because of the concept of sustainability and scientific development, the impact of global warming and climate change requires a change to a green economy, especially for the small island region of Maluku [9].

Environmental economy is a part of the economy that deals with the efficient use of resources. Because the environment provides direct value and the raw materials intended for economic activity, the environment and the economy are interdependent. For that reason, the way an economy is managed can have an impact on the environment which, in turn, might affect economic well-being and performance. One of the most famous critics of traditional economic thought on the environment is Herman Daly. In his first book, Steady-State Economics, Daly suggests, "enough is best", arguing that economic growth leads to environmental degradation and an unequal distribution of wealth. He emphasized that the economy is part of our environment, which is limited. Hence the idea that a steady-state economy is one in which there is an optimal level of population and economic activity that leads to sustainability. Daly calls for qualitative improvement in people's living - development - without lasting growth. Today, many of his ideas are linked to the concept of sustainable development. "(Environmental Literacy Council, 2015).

2. Characteristics of Small Islands and Climate Change Threats

Small islands have limited resources, for this reason, land use must be carried out efficiently to meet people's needs for water, food, building materials and a decent quality of life, and to maintain the functioning of the natural systems on which these depend.

Small islands are vulnerable to the threat of climate change. The problem that is often found on small islands in Maluku is a damage of coastal resources which results in reduced productive fisheries. Coral reefs are destroyed due to construction, dredging, pollution, silting and dynamization or fish poisoning.

The damage of mangrove forests has resulted in the unavailability of barriers to protect the area in the event of a tsunami or storm. In addition, if the mangrove forest to the seagrass beds is damaged, the aquatic animal life in it will also become extinct.
The most widespread environmental problem, affecting most of the small islands, is the unsafe disposal of domestic wastewater, particularly human waste and municipal waste. Thus, water pollution can become very serious problem, especially those related to clean water supply (rivers, groundwater and even rainwater catchments) as well as pollution of coastal waters, coral reefs and lagoons which are important for tourism, recreation and fisheries. This pollution can pose a very serious risk to human health.

Due to the narrow space of land on small islands it is imperative that comprehensive planning and proper land allocation for the most appropriate use or combination of land uses is required. The land is a limited and valuable commodity on an island. If the population is growing too fast, there will also be an expansion of population settlements which are generally located in coastal areas. This is certainly vulnerable if there is an increase in sea level or a tsunami due to climate change. In such condition, it is necessary to pay attention to the existence of the inhabitants of an island since not all of the small islands in Maluku are inhabited but many are uninhabited.

Land resources, which are the basis of agriculture, must be limited to the situation in small islands. The problem of erosion and loss of soil fertility on a narrow land needs to be considered so that it can be prevented for the sake of the sustainability of life on this small island.

When there is high rainfall in small and short watersheds with little water storage capacity, the water will quickly flow into the sea and very little can be stored in the ground. Such conditions during the dry season can cause serious water shortages that hinder development, and can create serious public health problems.

Damaged forest cover certainly causes a lot of water flow to stop flowing in the dry season. Thus water is often the most limiting factor in the development of small islands. The smaller the island, the more difficult the problem of solid waste disposal will be. Domestic waste dumps are often located in coastal swamps, and take land from other important uses.

Nature conservation measures are particularly important on islands where isolation has allowed the evolution of unique flora and fauna with a large number of endemic species, while small population sizes increase their vulnerability.

Demands to increase the local population on limited land resources will make the area difficult to reach by natural areas even if the land tenure situation allows such action. Stable habitat destruction and competition and predation by introduced species will increase pressure on native species.

The situation on many islands is of critical importance as the area of undisturbed natural habitat decreases. As a result, endemic species will be threatened with extinction. In this regard, the determination of several Essential Ecosystem Areas (KEE) in Maluku is urgently needed at this time.

One of the difficulties in developing infrastructure on small islands is the limited supply of sand and gravel without causing serious environmental problems. Removal of sand from the beach causes beach erosion and loss of the beach. This situation will certainly be more vulnerable if it is affected by climate change. Dredging of coral and sand from coastal waters destorys productive fisheries resources. No less important is the existence of onshore mining, such as what happened on Romang Island. This can affect the area available for agriculture and land use by leaving useless pits and mines.

If inhabitants of small islands wish to ensure a satisfactory environmental future, they must take measures for erosion prevention that are good at their resource base and necessary to stabilize population growth within the carrying capacity of their islands. Efforts to restore damaged resources, and to achieve comprehensive resource management and resource development activities, are focused on the critical coastal zone (which in islands can cover most or all of the land area). Small islands require a unique form of development that is adapted to environmental limitations and attracts many of the traditional residents who inhabit the islands. By considering the characteristics of small islands like that and the threat of climate change, both the Regional and Central Governments need to formulate appropriate development strategies in small islands which are very different from the large islands (continental).

3. Impact of the Covid-19 Pandemic
In 2019 Indonesia was ranked 62 in the world and fifth in the Southeast Asia Food Sustainability Index (FSI) in 2018, Indonesia scored 59.1 behind Ethiopia's 68.5 Food Loss and Waste (FLW)
Indonesia of around 300 kg/capita/year and number two in the world after Saudi Arabia. Governance crisis. The crisis of environment and natural resources is a crisis of governance. Governance crisis is a failure to regulate the actions of the state, market and community actors with interest in resources.

Sir David Attenborough, British television broadcaster and naturalist, already working for 60 years said at the World Economic Forum in Davos, that man has a terrifying destruction mechanism that can be annihilated living things and their environment unconsciously. World leaders reacted greatly slow to the climate crisis. This is because since the Industrial Revolution, the relationship between an urban society with the universe is getting away, so humans do not realize the impact their actions have on global ecosystems.

Through COVID-19, Planet Earth provides lessons that have been human adopt an individualistic way of life that ignores the fate of his environment. If the economy continues as it is now, the Earth will continue to create crisis after crisis, such as floods, extreme weather, rising sea levels, failure of food supplies, and outbreaks of more viruses.

A review in the scientific magazine Nature concluded, although the area with High biodiversity can be a source of seeds for new diseases, increasingly there is a lot of evidence that the loss of biodiversity can increase disease transmission. Scientists suggest preserving the area with endemic biodiversity, which only exists in certain geographic areas so that the prevalence of infectious diseases can be reduced.

4. Low Carbon Development on Small Islands

The commitment of the Ministry of National Development Planning / Bappenas to develop a policy "Low Carbon Development Planning (PPRK)". This policy is formulated to achieve inclusive economic growth through efforts to equalize development and alleviate poverty, while maintaining environmental quality and the availability of natural resources. Low Carbon Development supports the achievement of the 13th Sustainable Development Goals (SDGs) which is about Climate Action. Climate change must be integrated into the national development program. In this case, the Ministry of National Development Planning / Bappenas has a strategic role in ensuring the mainstreaming of climate change issues into national development plans.

In addition, several government efforts in collaboration with some other parties to support low carbon development in Maluku Province include:
- Adaptation activities carried out in collaboration with APIK USAID, and APIKI Maluku with the support of the Maluku Regional Government centred on Haruku Island, Aru Islands and Ambon, including the designation of several Climate Villages in Maluku.
- Preparation of a Road Map and Regional Action Plan for Maluku Climate Change Mitigation and Adaptation which will be implemented in the Maluku Development Planning, so that each regional apparatus can works based on the two documents.
- Mitigation activities on Saparua Island regarding the development of organic agriculture and handling of climate change with a survey of the biomass potential of organic agricultural crops and mangrove forests which was carried out between Yayasan Tiara Pusaka (YTP) Maluku with APIKI Maluku.
- Preparation of a document on the Proposal for the Establishment of a KEE on Buano Island by the Maluku Provincial Forestry Service, APIKI Maluku and other stakeholders.
- Research support such as the role of ants and birds on the small islands of Maluku as bioindicators of climate change.
- APIKI Maluku collaborates with BAPPEDA Maluku Province for the implementation of mangrove restoration in the Aru Islands by utilizing funds from the Green Climate Funds (GCF).
- Changes in the paradigm of government and society from exploitative development to a green economy through the integration of all planning documents (RTRW, RZWP3K, RPJPJP, RPJMD, KLHS, ROAD MAP MAPI, RAD MAPI) based on the conservation of biological diversity to achieve welfare and environmental sustainability.
- The transformation from an Exploitative Economy to a Green Economy has developed in the concept of Low Carbon Development and Build Back Better as part of the Sustainable Development Goals.
(SDGs), which needs to be formed in an integrated manner as a concept for Sustainable Small Islands Development and bring welfare for the community.

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