

Review of Aquatic Ecology Problems

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ABSTRACT

Ecology which studies individual organisms is called autecology, the environment is mainly studied in environmental science which is applied ecology with the aim that humans can apply the basic principles and concepts of ecology in the living environment. In ecology, the relationship between living things and their environment is objective, humans are seen as equal to other living things. In environmental science, humans are distinguished from other living things, and the view of the relationship between humans and the environment is subjective (ecology and environmental science). In ecology, interactions are not only between organisms and abiotic components but also between living organisms themselves. Interactions can occur between organisms of the same type or population.

Keywords: Ecology, Environment, Watershed, Aquatic, Population.



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INTRODUCTION

The relationship between residential environmental conditions and socioeconomic status on individual mental health. The home environment is the dominant factor associated with mental health disorders. A person who lives with a household member who has a severe mental disorder has a 4.5 times risk of experiencing an emotional mental illness. Therefore, government support is needed to provide decent, affordable, and healthy housing for the lower middle-class community (Brown et al., 2016).

Global warming is a significant issue in the world, is a challenge that must be faced by the world in the 21st century, this has an impact on the occurrence of temperature increases on earth, resulting in a loss of balance in the earth's cycle, rising surface temperatures and unpredictable seasonal changes (Penn & Deutsch, 2022). Hermon et al (2021) explain climate change impacts on natural disasters everywhere ranging from hurricanes, tropical cyclones, floods, endemics, droughts, El Nino, famine, tsunamis, and various other disasters that result in the loss of ecosystem functions that have an impact on ecological disasters. Furthermore, Mustikasari et al (2018) added that disasters occur due to hazard factors in the form of natural phenomena due to global warming and the existence of vulnerability in a society that accepts disaster risk.

FINDING (LITERATURE REVIEWS)

2.1 Uses of ecology for humans

Applications in various fields with the most tangible uses for humans, including 1) agriculture and agricultural technology; 2) management of wild animals living in wildlife reserves; 3) management of livestock, forestry, protection and preservation of the environment; 4) reforestation efforts; 5) prevention of the dangers of erosion, flooding, and pollution; 5) pest control and epidemiology, animal husbandry, aquaculture (land water cultivation) and mariculture (marine aquaculture); 6) veterinary medicine, especially in public health about infectious diseases between animals and transmission from animals to humans; and 7) human medicine, especially in public health such as environmental sanitation issues (Stolton et al., 2015).

The relationship between residential environmental conditions and socioeconomic status on individual mental health. The home environment is the dominant factor associated with mental health disorders. A person who lives with a household member who has a severe mental illness has a 4.5 times risk of experiencing an emotional mental disorder. Therefore, government support is needed to provide decent, affordable, and healthy housing for the lower middle-class community (Brown et al., 2016). Ecological changes such as marine biota, namely crabs, shrimps, types of reef fish, and coral reefs before reclamation are in moderate numbers and after reclamation, their presence is less. For land biota such as land fauna (butterflies, dragonflies, grasshoppers, and birds) after reclamation is more common than before reclamation. Likewise, land vegetation (coconuts, grasses, and wild plants) after reclamation grows more on reclaimed land than before reclamation. For social change, the factors studied are security, cooperation, community intimacy and care, sea feast habits, visits from outside the region, job opportunities, health level, level of education, and level of information obtained that before reclamation is not good while after reclamation is getting better. Economic changes are influenced by better income, necessities of life, and expenses after reclamation than before reclamation (Husna et al., 2012).

2.2 Organization and scope of environmental ecological studies

Individual

Individuals are the smallest part of a community group that cannot be separated into small parts. The term "individual" comes from the Greek word "individuum" which means undivided. In sociology, the individual is also defined as an organization or individual who is free and not bound by other organizations, be it actions, thoughts, or behavior.

Population

Individuals of the same organism will group to form a group and occupy a place at a time. In the population, some things are very unique, namely: Characteristics possessed by each member of the population, for example, life history, development, and others. Characteristics possessed by the population, for example, the death rate, birth rate, and age ratio.

Community

If a community is composed of a population group with one or two of them having a real influence on the environment and can control the flow of energy into the community,

then this species is called a dominant species. The dominance of species in large organisms can be indicated by their biomass (dry weight). In forest communities, it is indicated by the basal area of the plant stem (stem cross-section) or the percentage of land cover by the canopy. Striking structural features, eg dominant species, growth forms. Community physical habitat Functional features of the community, eg community metabolic type.

Ecosystem

Ecosystem comes from the Greek, namely Oikos which means house or place where organisms live, and system which means way or arrangement. The term ecosystem was introduced in 1935 by the British Ecologist AG Tansley. Etymologically, an ecosystem is a system that includes all living things that interact and are interdependent with their environment. Concept, an Ecosystem can be defined as a system that includes all living and non-living bodies (environment) that function together, are inseparable, interrelated, and interact with one another to create integrity (integrity), thus allowing the flow of energy that can create a clear trophic structure (food grade). The ecosystem is a certain environment with inputs and outputs of energy and materials that can be measured and associated with environmental factors. An ecosystem or ecological system is a living and non-living environment together with its population or community. Ecosystems are divided into 2, namely freshwater ecosystems and marine ecosystems.

Land water ecosystem

Land water ecosystems are aquatic environments found on land. Land waters are waters that are on the land surface and are generally located higher than sea level. This land water also flows from a high place to a lower place, until it is as high as the water at sea level. In addition, inland waters usually contain only a small amount of mineral solution compared to marine waters although this review will not specifically discuss it. distinctive features. Because of its existence on land, this ecosystem is still affected by the climate of the land, such as the rainy season, dry season, wind, and others. These circumstances act as one of the drivers of the fundamental difference between life and the fairy life in it (Utomo & Chalif, 2014). The characteristics of freshwater ecosystems include subtle temperature variations, less light penetration, and are affected by climate and weather. The most common types of plants are algae, while others are seed plants. Almost all animal phyla are found in freshwater. Organisms that live in freshwater have generally adapted. Freshwater ecosystems are classified into calm water and flowing water. Including calm water, ecosystems are lakes and swamps, and flowing water ecosystems are rivers.

Lake

A lake is a stagnant body of water and its area ranges from a few square meters to hundreds of square meters. In the lake, there is a regional division based on the penetration of sunlight. The area where sunlight can penetrate so that photosynthesis occurs is called the photic area. The area that is not penetrated by sunlight is called the aphotic region. In the lake, there are also areas of drastic temperature changes or thermocline. The thermocline separates the warm region at the top from the cold region at the bottom. The plant and animal communities are spread over the lake according to their depth and distance from the shore.

River

A river is a body of water that flows in one direction. The river water is cold and clear and contains little sediment and food. The flow of water and waves constantly provide

oxygen to the water. The water temperature varies with altitude and latitude. Communities in rivers are different from lakes. Fast-flowing river water does not support the existence of the plankton community to remain silent because it will be carried away by the current. Instead, photosynthesis occurs from the attached algae and rooted plants so that they can support the food chain. The composition of the animal community also differs between rivers, tributaries, and downstream. In the tributaries are often found, freshwater Man. Downstream are often found catfish and carp. Several large rivers are inhabited by various turtles and snakes. Especially rivers in the tropics, inhabited by crocodiles and dolphins. River organisms can survive not being carried away by the current due to evolutionary adaptations. For example, a thin dorsoventral body can be attached to stones. Several types of insects that live on the downstream sides inhabit small habitats that are free from whirlpools.

Sea Water

Marine habitat (oceanic) is characterized by high salinity (salt content) with Cl^- ions reaching 55%, especially in tropical marine areas, because of high temperatures and large evaporation. In the tropics, the sea temperature is around 25°C. The temperature difference between the top and bottom is high. The boundary between the hot water layer at the top and the cold water at the bottom is called the thermocline region. In cold areas, the temperature of the seawater is evenly distributed so that the water can mix, so the sea surface area remains fertile and has lots of plankton and fish. The movement of water from the coast to the middle causes the upper water to fall to the bottom and vice versa, thus allowing the formation of a food chain that runs well. Marine habitats can be distinguished by their depth and horizontal surface area.

Inland water ecology

Inland Water Ecology Use of knowledge about the influence of forests on watershed ecosystem management. Effect of woody vegetation on climate, water, and soil Environmental pollution Increased yield of river discharge stabilization. Effect of sediment and environmental improvement Surface and Groundwater Ecosystem Hydrological Cycle. A watershed is a land area that is an ecosystem unit with rivers and their tributaries that function to accommodate, store, and drain water that comes from rainfall to lakes or seas naturally, whose boundaries on land are topographical and separator. boundaries at sea up to water areas that are still affected by land activities. Watershed management is a human effort in controlling the reciprocal relationship between natural resources and humans in the watershed and all its activities to realize the benefits of natural resources for the benefit of watershed development and sustainability as well as community welfare. in increasing land productivity to prevent or reduce the level of danger of flooding, erosion, and drought, and to increase the welfare of the people in the watershed. Realizing optimal watershed conditions including quantity, quality, and distribution according to space and time. Sustainably realizing productive land conditions. Realizing equitable community welfare. The principle of watershed management is a unified ecosystem from upstream to downstream, one planning and one management. Multi-stakeholder, coordinating, comprehensive and sustainable. Adaptive and by the characteristics of the watershed. Fair distribution of costs and benefits among multi-stakeholders.

The basic policy for watershed management is carried out in a holistic, integrated, planned, and sustainable manner. The target area for the management is the watershed as a whole, from upstream to downstream. Responsible decentralization is carried out with a watershed approach as a management area unit. Based on community participation and

consultation at each stage of management. To overcome the limitations of government funds and ensure the sustainability of watershed management activities, it is necessary to implement the beneficiary pay principle, polluters pay principle and cost-sharing.

The growth of mangrove forests on Tunda Island, Serang, Banten in the eastern part (Station 1) is younger than in the southern part (Station 2). Then the density is also higher in the eastern part than in the southern part, but the condition of the mangrove forests of the two stations is still relatively good and very dense. In addition, the environmental quality of the mangrove vegetation of Tunda Island is still relatively high, the diversity and dominance of the mangrove forest are low, the uniformity is in a somewhat balanced state, the distribution pattern is relatively regular and the water quality parameters are not an obstacle to the growth of the mangroves.

From the resource aspect, it was found that the peat swamp forest has a direct influence on the condition of the river, which is indicated by the presence of eight families of fish in the river and the color of the river water which tends to be black. From the institutional social aspect, the results show that: 1) fishermen take advantage of the existence of social capital in the form of kinship and kinship patterns which are the foundation of social life; 2) fishing activities are the main economy, but fishermen's income has a high level of uncertainty; and 3) fishermen are supported by Damang, a facilitator from TNS Center, and WWF Central Kalimantan as river management actors and forming associative and dissociative interactions. The research provides direction to strengthen regulations in maintaining rights-based inland water fisheries management in the Sebangau River (Nurseptiani et al., 2021).

2.3 Ecosystem change and environmental impact

Human activities and natural disasters can cause changes in an ecosystem. Natural disasters, such as volcanic eruptions and earthquakes are something that is beyond human control. However, human activities, such as pollution and overexploitation of natural resources, will directly or indirectly lead to changes in the ecosystem. Destruction of a community's habitat will directly change the ecosystem in that habitat. For example, the exploitation of fish in lakes or rivers using explosives, electric currents, or toxic materials results in the destruction of community habitats in lakes/rivers and subsequently causes changes in ecosystems and decreases in biodiversity. In freshwater ecosystems, there are limiting factors that allow the mechanisms that take place in the ecosystem to run steadily. These limiting factors are related to freshwater habitat conditions (aquatic environment) namely temperature, transpiration, turbidity/turbidity, dissolved gases, dissolved oxygen, and dissolved carbon dioxide.

The Muaragembong Coastal Area is used as a multi-use area, resulting in irregularities in the use of the area, causing changes in the function of the coastal ecosystem which results in a decrease in the quality of the ecosystem and the environment. This resulted in environmental damage in the coastal area of Muaragembong District. Based on the existing conditions, this article aims to identify the impact of changes in the function of coastal ecosystems on the environment in coastal areas, especially those that are the locus of study in the coastal area of Muaragembong District. This is expected to provide an overview of the identification of impacts caused by changes in the function of coastal ecosystems in the Muaragembong Coastal Area so that it can provide input for planning the area in a sustainable manner (Asyiwati & Akliyah, 2017).

CONCLUSION

Aquatic ecology is the relationship between living things and their environment that is objective, in aquatic ecology, there are interactions not only between organisms and abiotic components but between the organisms themselves.

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