

***Studying Problems in Agricultural Areas to Find Effective Policy Solutions to  
Protect the Valuable Environment in Thailand's Agricultural Landscape***

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**Abstract**

The agricultural landscape includes three primary elements, First, agricultural areas and agricultural processes, second, concrete and abstract meaning or significance of the community, and, natural landscapes. Consequently, agricultural areas have evolved as a result of economic and social factors that have an impact on natural components and the environment. This study aims to, Firstly, investigate the challenges of agricultural landscapes, Secondly, research the value of agricultural landscapes, and then, improve integration for the protection of agricultural landscapes. By reviewing research, publications, documents, and related agencies, the study determined that the global agricultural landscape has economic values that correspond with economic development, but environmental values that are decreasing. It has reduced the forest area and biodiversity. It affects wildlife habitats, and water sources and soil deteriorates, causing pollution and causing global warming. Therefore, agencies around the world cooperate to support the laws related to landscape management as well as agricultural areas, and agricultural agencies provide tools and assessments as well as a project to conserve, maintain, and repair the agricultural landscape in order to reduce environmental issues and produce a sustainable agricultural landscape.

Keywords: Agriculture Landscape, Agriculture Landscape Value, Agriculture Landscape Policy

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## Introduction

Population growth has an impact on both urban and rural expansion, which directly affects food demand. As a result of the need to produce sufficient food, it leads to the expansion of agricultural areas across the globe. According to the Agricultural Organization, the quantity of agricultural land has increased by approximately 900,000 hectares since 1600. 1.25 million hectares of agricultural land were in existence in 1800. However, as a result of the industrial revolution, tools and machinery were developed to facilitate farming. The rapid expansion of agricultural land from 1800 to 2016 resulted in an increase of 5 million hectares of arable land, which influenced the evolution of existing land and forests. This is consistent with research on the effects of expanding agricultural areas on land cover (You, 2017). The expansion of agricultural land has an impact on the region's forest cover (Estacio, Basu, Sianipar, Onitsuka, & Hoshino, 2022). Environmental impacts, effects on ecosystems, flora, and fauna extinction (Vaz et al., 2021). The threat to global biodiversity posed by expanding agricultural land (Wang (Wang, Wan, & Fajardo, 2021). Additionally, agriculture degraded land with harmful substances in soil and water sources. (Arheimer, Torstensson, & Wittgren, 2004) or even the decrease of endangered and protected animals in specific areas (Mossman, Panter, & Dolman, 2015). Agricultural lands also contribute to climate change and make the environment worse (Kirchner, Schönhart, & Schmid, 2016). Based on these impacts, research on the impacts of agricultural lands around the world is being accelerated to highlight the negative impacts on the environment that are becoming a global problem.

The agricultural landscape is a consequence of the farmer's interaction with nature. Agricultural land expansion affects natural diversity, ecosystems, and ecological structures (Lomba, Ferreira da Costa, Ramil-Rego, & Corbelle-Rico, 2022). Numerous agricultural practices damage the agricultural landscape and have adverse environmental effects. Numerous regions have taken steps to protect agricultural landscapes and reduce environmental impacts. In agricultural areas, regulations, laws, and support for preserving the environment and ecology are made law. The European Union has a method for managing agricultural landscapes that takes the ecosystem, conservation, and preservation of agricultural areas into account (Licari, Boscutti, Bacaro, & Sigura, 2022). The budget for farmers has been encouraged and supported by the European Union to conserve the environment in agriculture by, for example, separating the borders of agricultural areas to preserve the natural vegetation in agricultural areas (Lütz & Bastian, 2002). In addition, management guidelines have been established, with the United Nations establishing seventeen Sustainable Development Goals. The principles relating to the agricultural landscape are: (1) Environmental policies that preserve a high-quality agricultural landscape, establish nutritional security, and preserve crop production while maintaining food quality by decreasing chemical usage and being environmentally friendly (zero starvation). (2) Protection and restoration of terrestrial ecosystems (life and land), including in agricultural areas, and promotion of afforestation as a means for achieving sustainability are necessary to increase forest area to avoid the extinction of species, rehabilitate degraded soil resources, and solve global climate issues (United Nations). Large areas of agricultural land can have both positive and negative effects. Large agricultural areas will contribute significantly to the development of a verdant, high-quality environment. If they are properly managed, they can increase plant diversity, aid in preserving the ecosystem, and enhance the biodiversity of large animal habitats.

Thailand is primarily an agricultural nation. Therefore, the agricultural landscape is regarded as a significant and expansive landscape with distinct diversity in each region, including the

central, northern, northeastern, and southern regions. The agricultural landscape is the most common landscape in the country and varies by regions, such as the agricultural landscape in the highlands, the agricultural landscape in the plains, the agricultural landscape in the river basin, and the agricultural landscape in flooded areas. At present, farming only considers the economic system. Consequently, the agricultural landscape impacts numerous factors. Therefore, numerous organizations investigate the impact of agriculture from a variety of angles. Both land changes, agricultural expansion, and the loss of diversity from monocultures contribute to the decline of diversity. Loss of sustainability in agricultural areas Agricultural regions contribute to global climate issues and pollution PM 2.5. Soil and water contaminated by agricultural chemicals The Ministry of Agriculture and Cooperatives has promoted environmentally friendly agriculture, such as organic and green agriculture. Non-toxic agriculture has been practiced in some areas but has not covered all aspects, causing environmental problems in agricultural areas spread throughout the region in Thailand. Due to the fact that such promotion excludes all facets of the agricultural landscape, this study emphasizes the value of agricultural landscapes, changes in the agricultural landscape, and their effects, including agricultural landscape management policies. This research was funded by the Thai Ministry of Science and Technology in accordance with the policies of both domestic and international relevant agencies.

### **Objective of research**

The Objectives of the research are to, firstly, research the effect of agricultural landscapes and their value in agricultural landscapes; and secondly, research the policy designed to maintain the agricultural landscape's value. And develop methods to manage the agricultural landscape through the process of document review and research. The meaning of the agricultural landscape, changes to the agricultural landscape, and their effects, as well as the importance and worth of agricultural landscapes, are examined in articles and related research. In addition, the study of the principles and work processes of agencies involved with agricultural landscape management, including the resolution of environmental issues in agricultural landscapes and the analysis of data on changes in agricultural landscapes and their effects. An analysis of elements in the agricultural landscape as well as their values; an analysis of agency policies on objectives; and the agricultural landscape management model in order to find suitable policies that can be applied to the agricultural landscape management in Thailand.

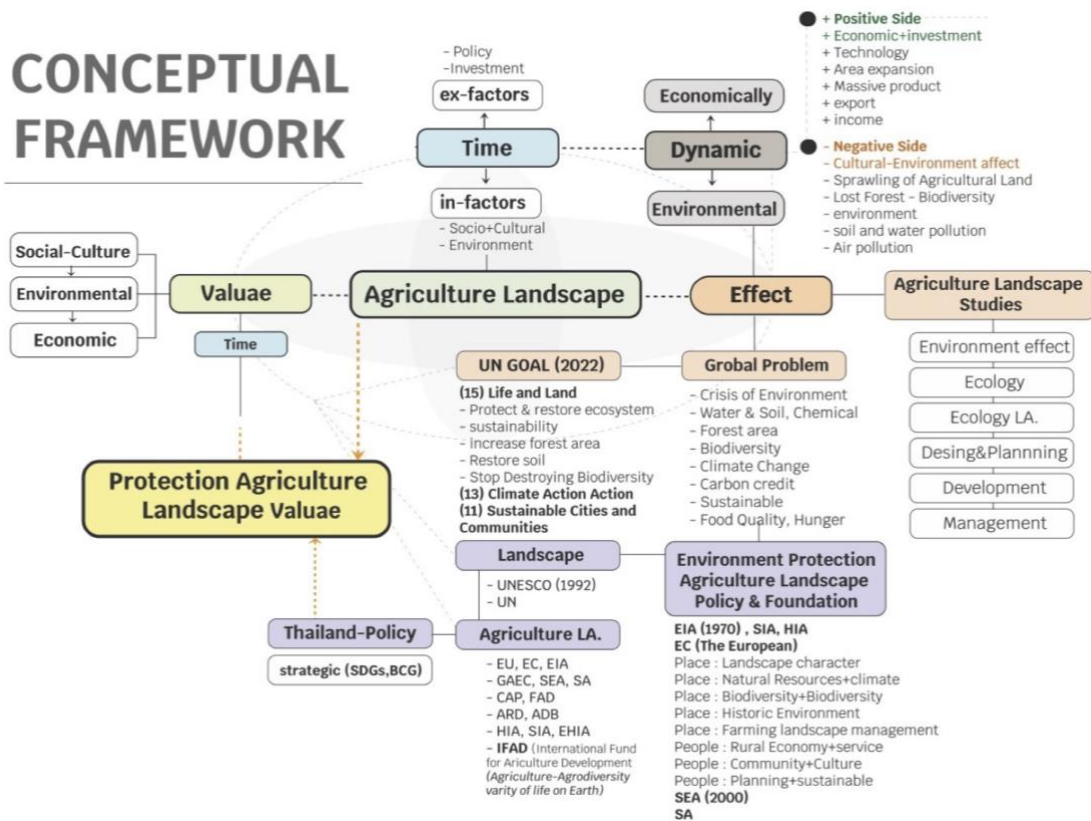


Figure 1: Conceptual framework

## Research result

The former agricultural landscape reflects the culture of humans. It remains an example of a cultural landscape consisting of diverse elements, including community settlements, architectural works, residential dwellings, and areas expressing the way of life and culture of various human groups. The agricultural landscape demonstrates the close relationship that exists between humans and natural environments. It made for an attractive and distinctive agricultural landscape (UNESCO). The appeal of the agricultural environment can also serve as a green space or open area for audience recreation and aesthetics, as well as a growing agricultural tourist destination. The agricultural landscape comprises three essential and valuable components: economic, social, cultural, and natural, that define and combine in a significant manner and collaborate in all three regards.



Figure 2: The natural landscape in the agricultural landscape in the Northeast of Thailand

## **1. Problems of the agricultural landscape**

### **1.1 Problems and impacts of the agricultural landscape caused by farming**

The agricultural landscape coincides with the development of cities or communities, but it is far from natural areas. Due to growing populations and urbanization, the agricultural landscape is expanding into rural areas and becoming more natural. Therefore, it consequently caused the fragmentation of nature by expanding on the original natural area (Balta & Atik, 2022). It affects natural areas and natural resources, such as forests and water, as well as the ecological structure of the ecosystem and biodiversity. Agricultural activities create environmental and climate problems. The quantity of water in natural water sources is affected by high water usage.

The National Economic Development Plan's expansion of agricultural land in Thailand promotes exports. It led to the expansion of agricultural land and the promotion of product productivity. Monoculture in some regions is unrelated to physical characteristics and the original natural vegetation system, resulting in intervention and alteration of the natural environment, particularly in mountainous regions, areas with gradients, and regions connected to the original forest. Agriculture in these regions breaks down natural ecosystems and reduces biodiversity. Although most research has focused on the harmful effects of agricultural land, there are studies and articles that emphasize the potential of agricultural land. It is a beautiful natural environment. It is a significant economic area for nature. It is an attractive spot with the potential to restore biodiversity. As a result, agricultural regions have evolved into green areas. It is a popular tourist and recreational destination.

Thailand linked agricultural land development policy with the Sustainable Development Goals by establishing the BCG Economy Model policy. It is related to the 2018–2037 National Economic Development Plan and the 20-year strategic management plan. They emphasized a growth plan based on a quality of life that is environmentally friendly and built a green economy for growth and diversity conservation. Restoration of rivers and canals both in urban and rural areas, promotion of agriculture through the conservation of natural resources, and the use of spatial identity to reflect cultural heritage, including watershed management, are the objectives of conserving natural resources and the environment, as well as natural resource restoration (National Economic Development Plan). There are policies regarding the development of agriculture that are consistent with international policies, but there is no holistic approach to agricultural landscape management that involves all aspects of the agricultural landscape. The present strategy focuses strictly on the expansion of farmland and agricultural endeavors. To manage the agricultural landscape in a sustainable manner, education and development must be holistic, including agricultural lands, agricultural communities, settlements, natural areas, and the environment, which are simultaneously important elements in the agricultural landscape.

The value of each agricultural landscape is different.



Figure 3: Natural elements, culture and way of life in Thailand's agricultural landscape

## 1.2 Value in the agricultural landscape

The relationship between humans and the environment contributes to the agricultural landscape, which has a variety of significant components (UNESCO). The value of the agricultural landscape must be comprised of vacant land, cultural land, and economic land. Each landscape has sub-elements such as Community Settlement, Farming landscape character, Man-made objects, and specific natural features of biodiversity. Some agricultural landscapes involve natural bodies of water, waterfalls, rivers, forests, and natural areas, and their respective values differ. Some of them have significant cultural value, such as community settlements with historical significance. In addition, it contains ancient architectural statues. Some landscapes have more natural value than economic value, for example, high-altitude agricultural landscapes with unique geological features. There is a river that provides water. There are forests and indigenous vegetation present, as well as a habitat for wildlife. However, the activities of local authorities must ensure the preservation of these three aspects of value. Moreover, based on the study of organizations involved in agricultural landscape management in Thailand, there is still no organization that fully deals with all three aspects of value. In contrast, many organizations in other countries have policies that protect the holistic landscape value of the same area. The whole urban setting is far from natural and agricultural landscapes. Every location will have a unique management approach. They can be divided into three groups: those who value nature and the environment; those who value heritage conventions; and those who value the environment and promote sustainable development.



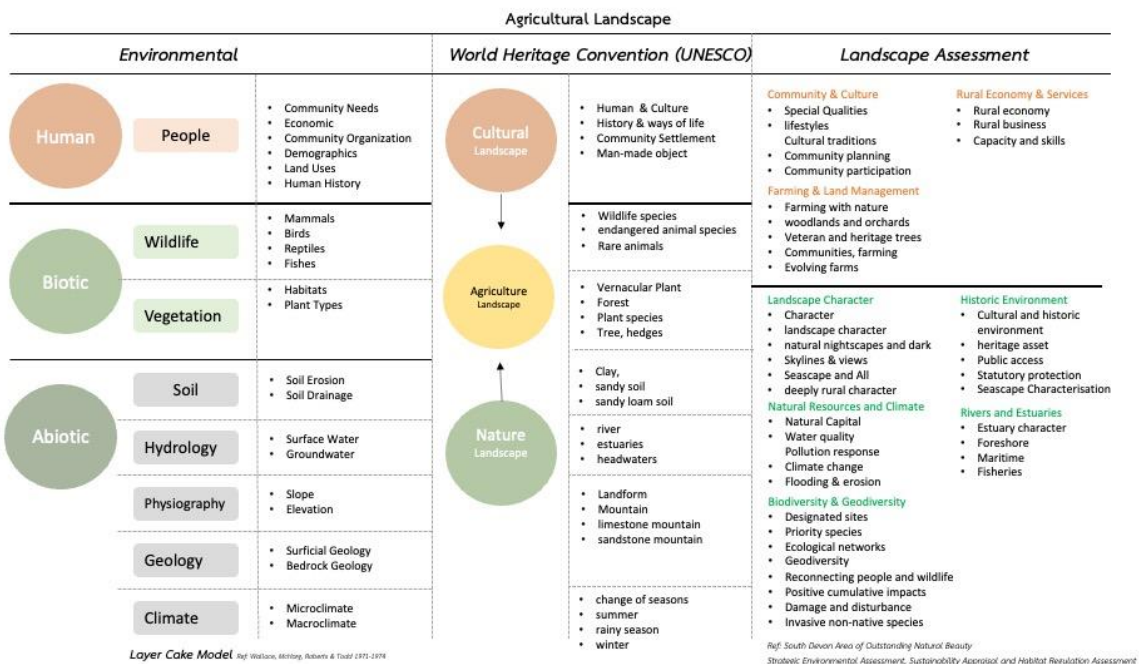


Figure 4: Natural elements and Cultural elements in the agricultural landscape

## 2. Appraisal and Management of Agricultural Landscapes

All across the world, agricultural areas have environmental effects. Numerous organizations are aware of the issue, and research has been started to figure out the best method for protecting, restoring, and enhancing the agricultural landscapes in Europe, America, and Asia. They are managed in various ways. There are regulations for protecting agricultural areas and promoting agricultural areas to reach criteria that have no adverse effects on the environment in the group of European nations, including maintaining economic value, promoting agricultural society, and maintaining the quality of the environment in the agricultural landscape. European nations utilize a standard to administer their verdant agricultural lands. It has ecological value and significance. UNESCO is unique in its ability to preserve and protect natural and cultural values, and there are numerous organizations that research the value and significance of the environment in agricultural landscapes, including the Organisation for Economic Co-operation and Development (OECD), United Nations (UN), and the European Landscape Convention (EU). They have established policies for managing the agricultural landscape, such as Strategic Environmental Assessment in EU Development Cooperation (SEA), which developed from Environmental Impact Assessment (EIA) and the Standard of Good Agricultural and Environmental Conditions (GAEC). Its objective is to establish and protect agricultural landscapes. The operational methods of each department are as follows:

### 2.1 UNESCO

The agricultural landscape is a component of the recognized cultural landscape by UNESCO. In addition to agricultural landscapes, UNESCO also focuses on natural landscapes, ecologically valuable landscapes, and other landscapes that greatly impact people. The cultural environment is always changing and evolving. Consequently, a management approach has been in place since 1992 (Rössler, 2006). After that, many countries around the world have applied the concept to manage their own cultural landscapes (Taylor and St Clair, 2017). The idea of managing cultural landscapes includes both tangible and intangible

landscapes, as well as the methods of management applied to emphasize that they are connected to one another (Scazzosi, 2004). There are a variety of cultural landscape management concepts, including conservation or development planning implementation (Pătru-Stupariu et al., 2019; Tengberg et al., 2012). At the regional or national level, area management methods must be used in a variety of ways and appropriately, as cultural landscapes, which are valuable and important to communities, are different from cultural landscape management (Magnaghi, 2011; Poli, 2020). Thus, the concept of agricultural landscape management, which is a part of the cultural landscape, must take seriously the identity of the community, along with economic and environmental factors in all areas and the changing times.

## **2.2 The European Landscape Convention (EU)**

The European Landscape Convention has the concept of protecting, restoring, and conserving valuable landscapes, including agricultural landscapes. They are an organization that oversees the production management, economic system, trade, and exports of agricultural products, with an emphasis on income and assistance for farmers' cultivation. They also manage agricultural land, preserving agricultural activities and promoting agriculture while minimizing environmental impacts in agricultural areas, preserving traditional geography, and managing rural areas. The previously mentioned concepts apply to the management of the community environment and the environment in agricultural areas with the objective of preventing the impact on the environment and preventing climate issues that might arise from agricultural land. Additionally, they have a budgetary fund to encourage farmer participation and support agriculture in order to achieve the organization's goals.

One of The European Landscape Convention's aims is to promote effective environmental management practices in agricultural areas. It has promoted an environmental management policy named "Condition for Maintaining the Good Agricultural Area and Environmental Condition of Land" and preserving the agricultural landscape's worth. The primary approach to resolving environmental and climate issues is to foster a healthy environment in the agricultural landscape, including water management, soil, and Carbon stock and Landscape, minimum level of maintenance. In order to maintain the environment in agricultural areas, they have established a policy with seven sub-issues as a standard. The study found four sub-issues in relation to the management of the environment and natural resources in agricultural landscapes: GAEC 2, GAEC 3, GAEC 4 and GAEC 6: regarding the proper use of water, the protection of groundwater, the maintenance of sufficient amounts of organic matter in the soil, and the prohibition of burning waste (except for plant health reasons), establishing a minimal land cover to preserve soil moisture.

There is also the issue of preserving the original ecosystem and preserving native vegetation along rivers, canals, and natural water sources in order to maintain the area's original ecosystem, including; GAEC 1, which is a method for establishing buffer zones along waterways in rural and agricultural areas with a minimum distance of 2 meters along the river bank. GAEC 5 emphasizes narrow-slope land management to prevent soil erosion issues. GAEC 7 emphasizes the protection and preservation of the area's original landscape, including traditional plants, native plants, ponds, ditches, solitary trees, groups of trees, perennial shrubs, and ground cover. Moreover, GAEC 7 prohibits cutting down trees and other plants during the breeding season to preserve habitat and protect wildlife.



### **2.3 Case Studies on landscape valuation and environmental management for Sustainability**

In European countries, the agricultural landscape is an essential and beautiful landscape. Therefore, there is a policy regarding the protection and preservation of the agricultural landscape's value, including economic, social, and environmental factors. Protecting the value of beauty in rural and animal husbandry areas is essential. In accordance with EU policy, the UK implemented a variety of projects to protect and restore significant agricultural lands. In the UK, the emphasis is focused on the effects of automated manufacturing processes on the climate, the usage of chemical fertilizers, environmental protection, and the preservation of biodiversity in the agricultural landscape.

The South Devon Area of Outstanding Natural Beauty (AONB) is one of the projects under the policy to protect, rehabilitate, and conserve the environment to ensure its sustainability into the future. The project is subject to the Strategic Environmental Assessment (SEA) in EU development cooperation, which has a four-step implementation process: First step; The need for assessment, Scope of the assessment, Evidence Base, and site characterization. Second step; Description of the AONB Management Plan and possible effects. Third step; Preliminary Considerations and final step; Fuller Considerations. The operating principle is to survey the project area, determine geographic information, analyze it to evaluate various areas, create assessment forms for the value and diversity of the environment, and finally assess the impact that may occur in the future under the relevant policy laws. And the relevant policy laws are the UNESCO World Heritage Convention concerning the protection of the world's cultural and natural heritage (1972), the European Landscape Convention 2000 (ELC), the National Parks and Access to the Countryside Act 1949, the Natural Environment and Rural Communities Act 2006 (as amended), the Wildlife and Countryside Act 1981, the National Planning Policy Framework July 2018, the South West River Basin Management Plan 2015, etc.

After collecting geographic data, the area was analyzed and divided based on significant physical characteristics. and developing various valuation strategies by SEA policies divided into 4 groups; (1) Natural Landscape: Landscape Character, Natural Resources and Climate, Biodiversity & Geodiversity, Historic Environment, and Rivers and Estuaries (2) Agriculture Land: Farming and Land Management, Rural Economy & Services, Tourism Access & Recreation (3) Cultural Landscape: Community & Culture, Communication, Education, & Awareness (4) Management and Development: Planning & Sustainable Development, Management, Organizations and Partnerships, Communication, Education & Awareness; and Coast and Marine Environment.

Upon completion of the project, evaluation Will discover the characteristics of the landscape in various ways, including an area with incredible natural beauty on water and land, and ecologically diverse environments, such as lowlands, wetlands, grasslands, and forests. There are management guidelines for each location, such as preserving the natural beauty, prohibiting the construction of buildings or the implementation of projects that may have an environmental impact, or ensuring that the project preserves the original ecosystem and diversity to be a habitat for native animals, etc. The project demonstrates a holistic approach to management and the integration of appropriate policies to cover the entire local landscape and integrate them accordingly, operating under the EU Environmental Management Policy for Sustainability.

## Conclusion

A study of the values of agricultural landscapes concluded that the World Heritage Convention (UNESCO) emphasized the protection of natural and cultural assets, which affect a significant number of people. The European Landscape Convention (EU) aims to protect the value of a variety of landscapes, including agricultural landscapes, through the Standard of Good Agricultural and Environmental Conditions (GAEC) policy, with an emphasis on the management of agricultural lands to reduce their environmental impact. Then, the Organization for Economic Co-operation and Development (OECD) emphasizes agricultural landscape ecosystems. Although every organization has different primary objectives, they all share the objective of preserving landscape and agricultural landscape values. The values are separated into three distinct categories: Agricultural Land, Cultural Landscape, and Natural Landscape, and on each side, there will be a variety of different components.

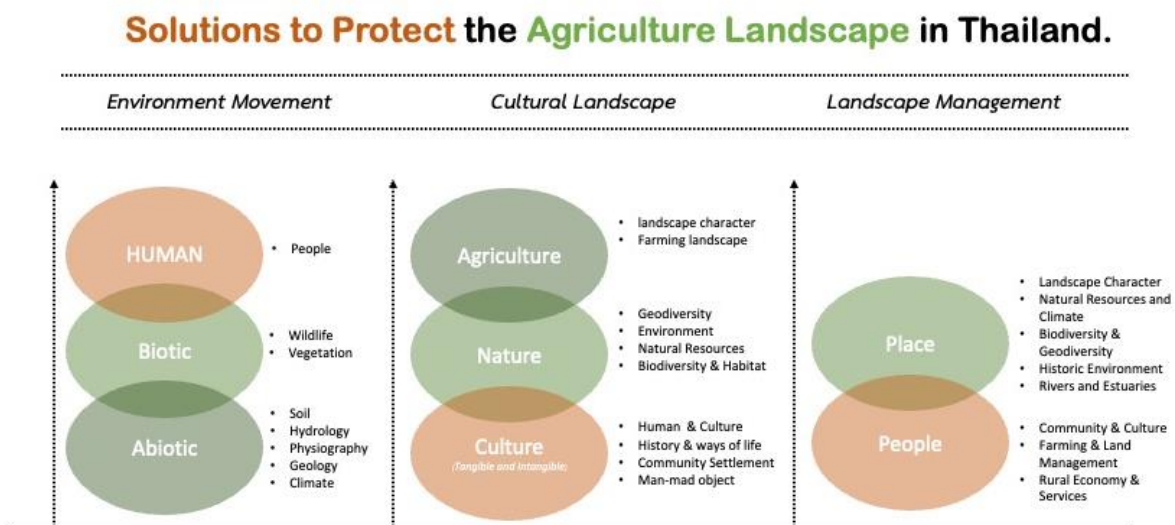


Figure 5: The three values of the agricultural landscape

Problems in the agricultural landscape are a result of managing the area, reducing social and cultural values, and especially not giving importance to natural values. Therefore, agricultural landscape management is an essential process for protecting and preserving the value of agricultural landscapes by creating a comprehensive policy. In European countries, the focus is on the landscape. change and the effects that occur, they have developed a policy to help protect and preserve this valuable landscape by combining the Strategic Environmental Assessment in EU Development Cooperation (SEA), developed from the Environmental Impact Assessment (EIA), and the Good Agricultural and Environmental Conditions, which concentrate on preserving land's value while minimizing environmental impacts and promoting optimal development. The major processes are the following: (1) a spatial analysis to classify the economic, social, cultural, and environmental values of the landscape. (2) investigate strategies that are consistent with the agricultural landscape, and (3) develop an evaluation form and its impact on agricultural landscape values.

## Solutions to Protect the Agriculture Landscape in Thailand.

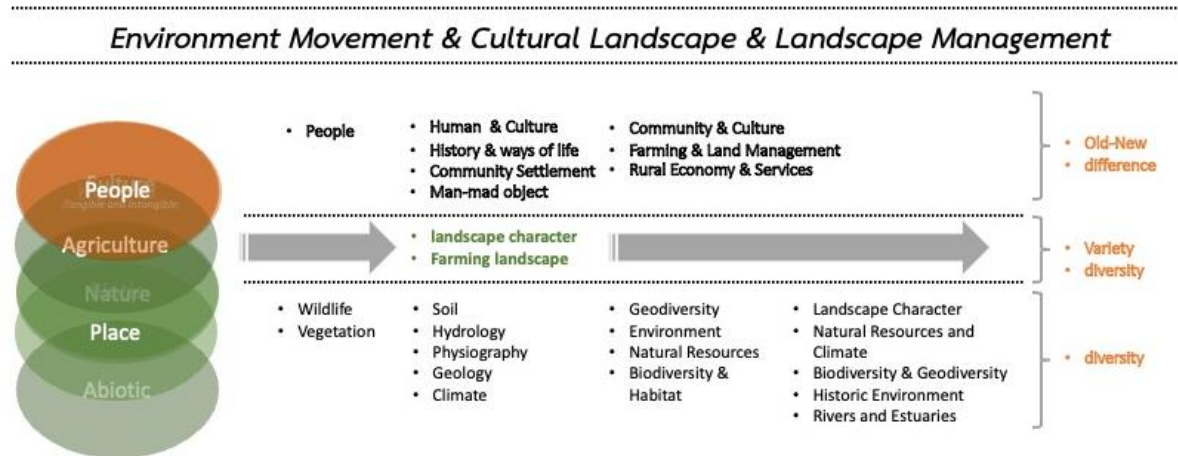


Figure 6: The guidelines for studying the values of agricultural landscapes

Environmental issues in the agricultural landscape are diverse. Policy and management approaches are also diverse. According to the study, there are still some comprehensive policies that can be implemented immediately. However, numerous policies from different organizations are directly and indirectly implicated. As a result, agricultural landscape management in Thailand must investigate three aspects of the agricultural landscape, including the value of agricultural land. Natural value (economic worth) and socio-cultural values are both tangible and intangible. In addition, Thailand must research applicable regulations and laws, such as conservation laws, policies on water resource restoration and environmental protection, natural resources, water resources, forests, wildlife, wildlife habitat preservation policies, or management and impact reduction policies, in order to analyze management approaches suitable for the area. The most important variable is integration to accommodate various social contexts and historical periods, and the management strategy consists of three components: (1) Natural value assessment; (2) Social and cultural value assessment; (3) Establishment of landscape assessment criteria by applicable policies and laws; (4) Summary analysis and evaluation; (5) Agricultural landscape development and management.

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