Research on Environmental Green Ecological Technology Based on Agricultural Pollution in Yunnan

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Abstract. This article constructs a multi-dimensional and multi-agent participation model for agricultural environmental pollution from the perspective of interest-related theory, and uses Yunnan Province as an example to fully explain this problem. With the help of literature analysis and statistical analysis, based on a comprehensive understanding of domestic and foreign agricultural environmental pollution and governance issues, relevant stakeholder theories and the state of agricultural environment in Yunnan Province, based on the theory of stakeholder theory, a government, Eco-environmental engineering aims to protect, improve and continuously use the existing ecological resources, thereby promoting the coordinated development of ecology, economy and society. Based on this, by exploring the impact of ecological and environmental engineering on agriculture in terms of natural resources, environment, economy, society, and science and technology, the agricultural ecological balance is transformed and constructed to achieve the purpose of promoting sustainable agricultural development.

Keywords. Yunnan, agricultural environmental pollution, stakeholders, countermeasure design.

1. Introduction
Sustainable development, as a brand-new development model, is an important result of human beings' profound reflection on agricultural civilization, and it is also a new rational solution to environmental pollution and ecological damage that is proposed in order to adapt to economic and social development. Sustainable development requires people to fully integrate society, economy, and environmental protection, and to achieve the purpose of mutually reinforcing and coordinated development. As an important part of economic development, agriculture is also facing new problems and challenges. Therefore, in accordance with the requirements of sustainable development, it is necessary to strengthen the protection of the ecological environment while ensuring the sustainable development of agriculture in order to achieve economic, Harmonious development of resources and environment[1].
2. Significance of applying agricultural environmental engineering in agroecology

(1) Planting and optimization technology. Including: intercropping and intercropping technology using the principle of symbiosis, simulating the three-dimensional structure of the ecosystem, and three-dimensional planting technology that make full use of the nutritional niche of the three-dimensional space.

(2) Field management technology. Including water-saving irrigation technology such as sprinkler irrigation, micro-irrigation, drip irrigation system, formula fertilization and precise fertilization and other scientific fertilization technologies, as well as pollution-free integrated control technology for diseases and insect pests[2].

(3) Multi-level effective utilization technology of material energy. Using the recycling principle and the "closed circuit control" principle of the ecosystem, the waste recycling method is used to integrate the production forms that are not related to each other into a circular waste-free production form. For example, technologies related to the ecological agriculture model such as agriculture and forestry integration, agriculture and animal husbandry, agriculture, forestry, animal husbandry and fishery combination, mutually use raw materials, make full use of organic waste generated in their production, living, processing and other processes, and integrate agricultural production into the ecological system. Turn the track.

(4) Comprehensive environmental improvement technology. Coordinate pollution control and environmental purification technologies for rural industrial economic activities and agricultural production activities by using the principle of value-added ring and combining with food chain theory.

(5) Fine seed and good technique. Utilize modern genetic engineering technology and conventional breeding technology, make full use of the germplasm advantages of the world, and improve crop resistance to diseases and insect pests.

3. Analysis of the status of agricultural environmental pollution in Yunnan Province

3.1. Provide a good ecological environment for agricultural development

Agricultural environmental engineering technology provides a good ecological environment for the development of ecological agriculture. With the assistance of agricultural environmental technology, we can achieve high-density aquaculture work, and then realize the cycle between material and energy, and then without reducing production. To protect the soil. In the same land space, the high-density farming of the agricultural environmental engineering technology itself is used to achieve the highest yield of crops in the smallest unit of land area, which has laid a good foundation for the development of ecological agriculture[3].

![Figure 1. Realizing effective use of agricultural energy green environmental protection technology](image)
3.2. Effective use of energy

The intensive planting and breeding methods of the agricultural environmental engineering technology itself can realize the centralized use of energy. Although some energy will be lost in the process of using the agricultural environmental technology, compared with the traditional agricultural ecological environment, the agricultural With the participation of environmental engineering, energy consumption is still lower. In addition to eating, agro-environment technology can also realize the efficient use of solar energy. As we all know, the essence of agricultural production is to convert solar energy resources in nature into food, and then to form the final agricultural products. Greenhouse facilities can precisely realize the efficient use of solar energy, and further increase the output of agricultural products without harming natural resources[4].

3.3. Management of the overall environment

Different from the traditional agricultural production environment, under the agricultural environmental technology, the development of agriculture not only pays attention to the output of agricultural products, but also pays more attention to the protection and improvement of the environment. At the same time as the use of energy, the agricultural environmental engineering technology also pays attention to the disposal of waste. While realizing the disposal of waste, it also ensures the harmlessness and pollution of the environment, thereby achieving the overall environmental management.

3.4. Application of agricultural environmental engineering in ecological agriculture

With the development of agricultural environmental engineering technology, more and more people realize the advantages and importance of agricultural environmental engineering technology. Therefore, more and more people choose to apply agricultural environmental engineering technology to the development of ecological agriculture. When it comes to the application of agro-environmental engineering in ecological agriculture, the more successful examples are: 1) the Trinity Ecological Agriculture Model; 2) the Four-in-One Ecological Agriculture Model[5].

![Figure 2. Analysis of the key technologies of the four-in-one eco-agricultural environmental protection model](image)
3.5. **Trinity Ecological Agriculture Model**

The Trinity eco-agriculture model is mostly applied in southern cities. Among the Trinity eco-agriculture model, the most famous is the "pig-marsh-fruit" model. This cycle pattern is mainly composed of three parts. Biogas is used as the transmission link for the whole cycle process, animal breeding and the cultivation of fruits and vegetables are combined as the final technical project. It is mainly based on the principles of eco-economics, which includes both waste treatment and clean production and breeding. For example, for example, we can plant forages to produce crops to feed pigs, and the manure produced by pigs can be put into the biogas digester to form carbon dioxide and heat that promote the growth of forages, so that the forages can grow rapidly, and the forages after growth can continue Supply to pigs, promote the growth of pigs, and so on, and endlessly cycle to realize the process of circular production, and then realize the application of agricultural environmental engineering technology in agricultural ecology.

3.6. **Four-in-one ecological agriculture model**

Compared with the trinity ecological model in the southern region, the north more respects the four-in-one eco-agricultural model, such as "sunlight greenhouse cultivation-facility animal husbandry-biogas fermentation-toilet improvement" is different from the trinity model, this model is mainly Solar energy is used as the main energy source, biogas is used as the transmission link for the whole cycle production, and the cultivation of melons, fruits and vegetables, as well as the cultivation and toilet fly technology, are combined as the final technical project to realize the agricultural environmental engineering technology in the ecological environment. Applications in agriculture. For example, the greenhouse facilities of agricultural technology itself can efficiently use solar energy to achieve crop production and animal breeding. The problem of insufficient organic fertilizer can be solved by breeding these animals. At the same time, the biogas produced by the built biogas pond can be used to Cooking and lighting can also supplement the carbon dioxide and heat required for the production of vegetables, thereby achieving the recycling of materials and energy.

### Table 1. Nitrogen and phosphorus loss calculation table

| Farmland nature         | Pure nitrogen application (kg/hm²) | Pure nitrogen loss coefficient (%) | Loss coefficient of pure phosphate fertilizer (%) |
|-------------------------|------------------------------------|-----------------------------------|-----------------------------------------------|
|                         |                                    | Urea | Ammonium carbonate | Other nitrogen fertilizers |                                |                                    |
| Paddy field             | <300                               | 18   | 24                 | 22                             | 4                               |
|                         | 300-400                            | 20   | 26.5               | 24.5                           |                                 |
|                         | >400                               | 22   | 29                 | 27                             |                                 |
| Dry land, garden land   | <300                               | 22   | 29                 | 27                             | 5                               |
|                         | 300-400                            | 10   |                    |                                |                                 |
|                         | >400                               | 11   |                    |                                |                                 |

According to the correlation coefficient, the loss rate of nitrogen fertilizer in Yunnan Province is 18.7%, and the loss rate of phosphate fertilizer is 4.3%. Among them, the nitrogen fertilizer loss rate in the paddy field reached 23.0%, accounting for 82.4% of the province's nitrogen fertilizer loss; the phosphate fertilizer loss rate was 4.0%, accounting for 60.7% of the province's phosphate fertilizer loss[6].
4. Yunnan Province’s agricultural environmental pollution control countermeasure system

4.1. Government Department Countermeasures

Due to the external characteristics of agricultural environmental pollution, the government must play a leading role in the management of agricultural environmental pollution. First, the government must formulate laws and regulations to regulate the application of agricultural fertilizers and pesticides. While banning unqualified pesticides and fertilizers from entering the market, it is also forbidden to allow agricultural residue products to exceed the standards and to effectively control them from the source. Second, the government should actively formulate evaluation standards for agricultural environmental pollution. According to the pollution status of each area, reasonable classification and grading are carried out, and different measures and policies are adopted according to the type and level. Third, the government should formulate access to agricultural production. While prohibiting enterprises that do not meet pollution standards from entering the agricultural sector, they are also actively encouraging industrial optimization and upgrading in different regions to reduce agricultural pollution. The fourth is to formulate subsidies for agricultural environmental pollution treatment. Integrate and optimize various types of agricultural subsidies to make them directly linked to agricultural environmental pollution control, and give certain rewards to those enterprises and individuals who have contributed to agricultural environmental pollution control. Subsidies are deducted for individuals and enterprises that increase agricultural environmental pollution. Rewards for users of biological pesticides and winners of green agricultural products should be increased. Through rewards, the multi-agents are linked to the benefits of agricultural environmental pollution control, and their interests drive them to develop in a resource and environment-friendly direction.

4.2. Farmers’ countermeasures

On the one hand, farmers are rational economic people. The main reason why they choose to use chemical fertilizers and pesticides is that chemical fertilizers and pesticides cannot only increase food production, but also effectively reduce labour costs, so that they can obtain greater economic benefits in the short term. On the other hand, pollution of agricultural environment such as soil and water caused by pesticides and fertilizers is difficult to find the specific subject, so it is also difficult to be punished accordingly. The benefits for farmers to use chemical fertilizers and pesticides far outweigh the costs they pay. Therefore, the use of chemical fertilizers and pesticides by farmers has become a relatively advantageous decision-making behaviour. It is both a subjective desire of farmers to protect the agricultural production environment, and they will also use chemical fertilizers Attracted by short-term extra profits of pesticides.
Firstly, the principle of price should be fully applied in the treatment of agricultural environmental pollution by farmers. Not only should we generally increase the price of agricultural fertilizers, but we can also consider the implementation of differentiated prices based on the amount of agricultural and fertilizer used by farmers. Farmers give certain subsidies; the second is the use of pesticides and fertilizers, classifying agricultural products into certain grades, and implementing government differential price protection to guide farmers to use less fertilizers and pesticides.

4.3. Corporate Countermeasures
Energy saving and emission reduction is the most effective way to reduce the agricultural environmental pollution of enterprises. At present, local township and village enterprises must adjust the industrial structure and change the growth mode. Based on this, corporate agricultural environmental pollution control policies must include incentive policies that guide companies to transform traditional, backward and highly polluting production processes, technologies, and punitive policies for companies that fail to meet pollution standards. These policies can be either laws and regulations issued by the government, or rewards and protests by relevant environmental organizations.

4.4. Community Countermeasures
It is an effective way to improve agricultural environmental pollution by propagating and guiding residents to purchase high-quality agricultural products in the community, forcing farmers to improve the quality of agricultural products. Actively guiding household farmers to purchase pollution-free, green and organic agricultural products, and urging farmers to establish corresponding technical specifications and standards for safe agricultural production in the agricultural environment, are of great significance to agricultural pollution control. On the one hand, the government, industry associations or local environmental protection organizations can give certain levels of subsidies to community residents for purchasing high-quality green agricultural products, organic agricultural products and pollution-free agricultural products; on the other hand, for farmers who strictly implement high standards for agricultural production And enterprises give certain written and material rewards to encourage other farmers and enterprises to follow suit.

5. Conclusion
Based on this, before formulating countermeasures for the control of agricultural environmental pollution in the future, Yunnan Province must determine a clear general idea, follow the principles, countermeasure design, the relationship between the subject, the object, and the gas stakeholders, and plan and step by step to enhance and differentiate them. And find out how and when the countermeasures are implemented. In the field of design and taxation, we must determine the ownership; in operation, we can implement unified countermeasures in a certain area, and form a government-led, multi-party participation mechanism. In particular, the principle of special funds should be realized; although the stakeholders are involved in the governance of the agricultural environment based on stakeholders, the system coordination of countermeasure tools will be a huge challenge. Therefore, there must be some flexibility in the formulation of countermeasures. While clarifying the rights and obligations of relevant subjects in the governance of agricultural environmental pollution from laws and regulations, actively introducing market prices and other means to cooperate accordingly.

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