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Retraction

Retracted: Research on the Optimization of Agricultural Industry Structure Based on Genetic Algorithm

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] L. Liu, "Research on the Optimization of Agricultural Industry Structure Based on Genetic Algorithm," *Advances in Meteorology*, vol. 2022, Article ID 3748080, 8 pages, 2022.

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Research Article

Research on the Optimization of Agricultural Industry Structure Based on Genetic Algorithm

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Due to the complexity and importance of optimizing and adjusting the crop planting structure in the Jianghuai hilly Tangba irrigation area between the upper reaches of the Huaihe River from Xinyang to the lower reaches of the Huaihe River in China, and based on experimental results from the Feidong Badou Irrigation Experiment Station, the farmland was modeled using rainfall and runoff data from the Tangba irrigation area. By examining the water balance of submerged irrigation, an optimization model of the agricultural industry structure was developed using genetic algorithms, and the model was solved using an accelerated genetic algorithm. Developing the research findings may provide scientific and technological support for adjusting the planting structure and formulation of irrigation systems in the Jianghuai Hills and Tangba irrigation area between the upper reaches of the Huaihe River and Xinyang, as well as significant practical guiding significance and application value.

1. Introduction

China is a largely agricultural country, with the planting sector dominating the economy. The agricultural economy serves as a critical basis and fundamental assurance for the development of the national economy, and it is growing rapidly. An acceptable crop plan has significant practical implications for food production management, as well as for the assessment of food and agricultural security [1–5]. The optimization and adjustment of crop planting structure have long been a significant research topic in agricultural geography and agricultural sustainable development, and it has attracted considerable interest from academics both at home and abroad, according to a recent study. Agricultural remote sensing technology has been widely employed in crop planting research since the 1970s and 1980s and has produced a number of productive research outcomes. By developing the LACIE plan, for example, the USA has built a global agricultural monitoring and operating system that allows it to observe and analyze the growing status of crops at all stages of its growth cycle [6, 7]. Agronomic structure study has traditionally centered on the optimization and adjustment of crop planting structure in my home nation of Brazil. In the 1990s, Yang Guangli and colleagues proposed a broad strategy for the growth of my country's planting sector, which was later adopted. Actively promote the successful coupling of modern technology and agricultural machines to maximize resource use and efficiency. In conclusion, the rationality of crop planting structure not only directly affects the high yield and bumper harvest of agriculture, as well as the improvement of farmers' income levels, but it also plays a critical role in the development of the agricultural economy [8, 9].

Total factor productivity is expected to grow as a result of supply-side structural reform, which is intended to drive structural adjustment through reform. Increased agricultural total factor productivity is one of the most visible evidence of agricultural progress. This is one of the most important indicators of agricultural modernization (TFP) [10–13]. Due to the combined limits of the law of declining marginal returns of production factors and the resource environment, it will be impossible to maintain agricultural growth only on the basis of factor inputs in the future. It is critical to the long-term development of agricultural production and production systems. Theoretically, in the case of multi-output, in addition to technological progress, technological efficiency changes, and scale efficiency changes, mixed efficiency changes are also the driving force behind the growth of total factor productivity. In practice, however, mixed efficiency changes are rarely observed. The term "mixing efficiency" refers to the increase or reduction in total output as a result of a change in the output mixing structure under the conditions of specific input and technologically possible processes. The efficiency of the mixing process is referred to as mixing efficiency. Farming structure adjustment consists of modifying the structure of agricultural production, resulting in a change in total agricultural output. This change in total agricultural output, in turn, affects the increase of agricultural total factor productivity [14, 15]. The price mechanism has an impact on the adjustment of the agricultural structure of the country. A more reasonable agricultural product supply can be produced if the production structure of agricultural goods is modified in response to resource and environmental limits as well as market demand. As a result, the total factor productivity of agriculture can be increased. Since 1978, the agricultural output structure of China has undergone a significant transformation. According to the United Nations Food and Agriculture Organization, agricultural production accounted for 80.0% of total output value in 1978. Forestry contributed 3.4%, animal husbandry contributed 15.0%, and fishery contributed 1.6% to the total output value in 1978, according to the UN Food and Agriculture Organization. The proportion of agricultural output value in the total output value of agriculture, forestry, animal husbandry, and fishery decreased from 52.3% in 1978 to 52.3% in 2016 [16–20].

Over the past few years, intelligent algorithms have emerged that include the genetic algorithm, particle swarm algorithm, neural network, and others. These algorithms belong to a class of probabilistic global optimal search algorithms, which are becoming increasingly popular [21–25]. When it comes to model application, many researchers have merged intelligent algorithms with multi-objective optimization. The optimal design plan of the agricultural planting structure in the Yanzhou plain parallel irrigation project was determined using a genetic algorithm, and a fuzzy optimization model was developed with the goal of making full use of water resources, increasing the output value of the planting industry, and increasing investment income [26, 27].

The Jianghuai hilly area is located between the Jianghuai and Huaihe Rivers, and the overall conditions of agricultural production in this area are considered to be relatively favorable. Over the years, rice and wheat wheels have been the primary crops, with a variety of other cereals and soybean cultivation serving as supplementary crops [28, 29]. It is one of the most important grains and oil-producing regions in the province of Anhui. Ponds and dams, particularly in the watershed ridge area of the Jianghuai hills, have a long history of serving as water storage and irrigation facilities. During the Warring States Period, there was a popular belief that the water was being used to irrigate crops. Statisticians estimate that as of the end of 2010, there were 479,200 ponds and dams throughout the Jianghuai hills, with a total capacity of 2.758 billion ml [21, 30]. Although the majority of existing pond and dam projects were built in the 1950s and 1960s with lax construction standards and a lack of clearly defined management systems, the result has been significant siltation and waste, reducing the irrigation and water storage capacity of the pond and dam projects significantly. The mismatch of water resource structure and availability in the region exacerbates the conflict between supply and demand for water resources, resulting in considerable losses in the agricultural sector [31]. Thus, one of the most critical tactics for resolving the conflict between water availability and demand in this region is through crop planting structure optimization and adjustment, which is one of the most effective approaches now accessible. It has the ability to significantly increase high and reliable agricultural yields while also enhancing farmer revenue in this region [32, 33]. Additionally, it will be critical in eradicating poverty. To demonstrate the issue, this study will utilize an example of a typical pond dam irrigation area in the Jianghuai hills. The findings of the tests conducted at the Feidong Badou Irrigation Test Station will be utilized to conduct a water balance analysis of the study area's pond dam irrigation system, with the results reported in the following section. By utilizing the objective function of the crop planting structure optimization adjustment model, it was possible to construct the most appropriate crop planting structure for the study area's current working conditions, which served as a theoretical foundation for adjusting the regional industrial structure and formulating the irrigation system in the study area.

There is still much space for improvement in Jianghuai's planting sector, and optimizing the planting structure not only promotes sustainable agricultural development and efficient water usage but also significantly enhances the agricultural economy. The balanced analysis of farmland submerged irrigation water is carried out in this article using the test results of Feidong Badou Irrigation Experiment Station. A genetic algorithm-based optimization model of agricultural industry structure is constructed using the simulation of rainfall and runoff in Tangba irrigation area. Developing efficient water use and ensuring per capita food demand are critical practical guiding principles.

2. History, Incentives, and Policies of China's Agricultural Structural Adjustment

The stages of China's agricultural structural adjustment are roughly divided into the following five stages: 1979–1984, 1985–1991, 1992–1997, 1998–2003, and 2004–2016.

1979–1984—The direct cause of the structural adjustment at this stage was that the production team took on too heavy a task of requisitioning grain, and the farmers' enthusiasm for production was severely dampened. In 1981, the "Report on Actively Developing Diversified Operations in Rural Areas" put forward the policy of "Never relax grain production and actively develop diversified operations," to make the production structure of grain and cash crops reasonable, and to promote the overall promotion of agriculture, forestry, animal husbandry, and sideline fishing. In 1984, the output of grain, cotton, oilseeds, and meat increased at a rate of 5.0%, 19.3%, 14.8%, and 10.3% respectively. This time, the agricultural structure adjustment was the government used administrative means to require farmers to plant what and how much and did not follow the resource endowments and comparative advantages of each region. Therefore, the adjustment of agricultural structure in this period may restrain the growth of agricultural total factor productivity [4, 7].

1985–1991—After the adjustment of the agricultural structure in the previous period, it became difficult to sell grain and cotton. In 1985, it continued to implement the policy of never relaxing grain production and actively developing diversified operations, and decided to support the development of animal husbandry, aquaculture, and forestry. In 1986, it was emphasized that in adjusting the industrial structure, the relationship between grain production and diversification should be properly handled. The agricultural structure adjustment in this period is still the government using powerful administrative means to ask farmers to plant what and how much, rather than guiding them through the price mechanism. Therefore, the adjustment of the agricultural structure during this period may still not bring about the growth of agricultural total factor productivity.

1992–1997—After entering the 1990s, the market demand changed, and the demand for high-quality agricultural products increased. To this end, the 1992 "Decision on the Development of High-yield, High-Quality, and High-Efficiency Agriculture" proposed to continue to adjust and optimize the structure of agricultural production in a market-oriented manner and made it clear that no matter planting, forestry, animal husbandry, and aquaculture, it is necessary to expand high-quality products. Production is placed in a prominent position, and as the focus of structural adjustment, we should pay close attention to it. In accordance with the policy of developing high yield, high-quality, and high-efficiency agriculture, all localities encourage farmers to adjust their production structure and develop high-value-added agricultural products according to market demand. In the new economic environment, the market mechanism has played a decisive role in agricultural production. Therefore, the adjustment of agricultural structure in this period promoted the growth of agricultural total factor productivity [13, 16].

1998–2003—The general decline in agricultural prices in 1997 and 1998 triggered this agricultural restructuring. In 1999, "Several Opinions on the Current Adjustment of Agricultural Production Structure" proposed that the main content of agricultural structure adjustment is to adjust and optimize the structure of crops and varieties of planting, optimize regional layout, and develop animal husbandry and agricultural product processing industry. In 2000 and 2002, the "Opinions on Doing a Good Job in Agriculture and Rural Economy" put forward the development of pollution-free vegetables and green food, and the improvement of the quality and safety of agricultural products, which has gradually become an important part of agricultural structural adjustment. Therefore, the agricultural structural adjustment during this period may further promote the growth of agricultural total factor productivity.

2004–2016—Beginning in 2004, the restoration of grain production and the improvement of comprehensive grain production capacity have become the focus and foundation of agricultural structural adjustment. From 2004 to 2006, it was proposed that the agricultural structure should be adjusted and optimized in accordance with the requirements of high yield, high quality, high efficiency, ecology, and safety. In 2014, a new national food security goal was proposed to ensure the basic self-sufficiency of grains and absolute security of rations. However, the grain price policy has restricted the process of agricultural structural adjustment. The continuous high level of grain prices has led to the deformity of the agricultural structure. The reform of grain prices began in 2015, but the timing was relatively late. Therefore, the agricultural structural adjustment during this period may hinder the growth of agricultural total factor productivity.

In recent years, sophisticated algorithms such as the genetic algorithm, particle swarm algorithm, and neural network have emerged. These algorithms are part of a growing class of probabilistic global optimal search algorithms [21–25]. Numerous academics have combined intelligent algorithms with multi-objective optimization when it comes to model application. A genetic algorithm was used to determine the optimal design plan for the agricultural planting structure in the Yanzhou plain parallel irrigation project, and a fuzzy optimization model was developed with the goal of maximizing water resource utilization, increasing the output value of the planting industry, and increasing investment income.

3. The Proposed Method

This article uses the SCS model to design the flood model. The model has the characteristics of a simple calculation process, fewer required parameters, easy acquisition of data and data, and few requirements for observation data. It is especially suitable for areas with no data or lack of data. The basic relationship between rainfall and runoff established based on SCS is

$$R = \begin{cases} \dfrac{(P - \alpha S)^2}{P + (1 - \alpha S)}, & P \geq \alpha S, \\ 0, & P < \alpha S. \end{cases} \quad (1)$$

Generally, it is set $\alpha = 0.2$ for experimental agriculture in the USA, but because of the relatively uniform rainfall distribution over time, approximately 70% of the rainfall enters the soil through infiltration. In contrast, the rainfall season in China varies greatly, and there are concentrated heavy rainstorms, only approximately 40% of the precipitation enters into the soil through infiltration, according to the World Bank. As a result, when employing this model, the value is less than 0.2, and in most cases, it is less than 0.05 The particular value is calibrated based on the hydrological data of the watershed, or the value of a similar hydrological area is transferred. For example, in this study, $\alpha = 0.15$ was entered as the specific value.

Due to the large variation range of S value, it is inconvenient to take the value, so the dimensionless parameter CN is introduced, its value range is $[0, 100]$, and the empirical relationship is defined as

$$S = \frac{28000}{\text{AMC}} - 280, \tag{2}$$

where AMC is a dimensionless parameter that reflects the comprehensive characteristics of Antecedent Moisture Condition (AMC), vegetation, slope, soil type, and land use status in the early stage of the basin, and can better reflect the impact of underlying surface conditions on yield.

For the wet state level, the CN values of different wet states have the following mutual conversion relationship.

$$\begin{aligned} \text{AMC}_1 &= \text{AMC}_2 - \frac{20 \times (100 - \text{AMC}_2)}{100 - \text{AMC}_2 + \exp[2500 - 0.065(100 - \text{AMC}_2)]}, \\ \text{AMC}_3 &= \text{AMC}_2 \times \exp[0.065 \times (100 - \text{AMC}_2)]. \end{aligned} \tag{3}$$

The addition of a genetic algorithm to multi-objective functions where the objective function and constraints are both linear functions reduces the likelihood of slipping into the local optimum and makes global optimization more feasible. Figure 1 illustrates the functional organization chart. The multi-objective optimal solution problem can be described as follows:

$$\min[f_1(x), f_2(x), \ldots, f_m(x)], \tag{4}$$

$$\text{s.t.} \begin{cases} \text{lower bound} \le x \le \text{upper bound}, \\ \text{Aeq} \cdot x = \text{beq}, \\ A \cdot x \le b. \end{cases} \tag{5}$$

The calculation of the water demand WD_c of each stage of the crop is obtained by multiplying the reference crop evaporation D_0 at the same stage and the crop coefficient of the corresponding stage, and the formula is as follows:

$$\text{WD}_c = \beta_c \times \text{WD}_0, \tag{6}$$

where WD_0 is the evapotranspiration at a certain growth stage of the reference crop and β is the evapotranspiration at a certain growth stage of the reference crop.

Then we calculated the WD_0, the formula is as follows:

$$\text{WD}_0 = \frac{0.437\Delta(\text{Radiation}_n - \text{Soil Heat}) + \sigma(1000/(T + 300))\text{Speed}_2(\text{SVP} - \text{AVP})}{\Delta + \sigma(1 + 0.35\text{Speed}_2)}, \tag{7}$$

where Radiation_n stands for sunshine, Soil Heat stands for surface temperature, Speed_2 stands for irrigation rate stands.

Due to a lack of comprehensive surface runoff observation and hydrological data in the study area, this article calculates effective rainfall using the simplified approach of typical annual rainfall with varying frequencies that are frequently used in production practice. The calculating formula is as follows:

$$\text{rain}_e = \varpi \text{rain}, \tag{8}$$

where ϖ is the effective utilization coefficient of rainfall, which is related to factors such as total rainfall, intensity, and duration, soil properties, crop growth, ground cover, and planned wet layer depth.

The water consumption of rice seedlings, soaked fields, and infiltration are all calculated based on the experimental results of the Piaoshihang irrigation area and the Badou irrigation experimental station in the Jianghuai hilly area. In addition, the Jianghuai hilly areas are mostly hilly areas, and the groundwater is generally buried deep, and the utilization of groundwater is generally not considered.

The main body of water storage irrigation in the pond dam irrigation system is the pond dam. According to the principle of water balance [12], we can get

$$\begin{aligned} \text{Storage}_i = \text{Storage}_i + \text{Income}_i - \text{Irrigation}_i \\ - \text{Loss}_i - \text{Discharge}_i, \end{aligned} \tag{9}$$

where Storage_i is the water storage volume of the pond dam irrigation system at the end of the ith period, Income_i is the inflow of the pond dam irrigation system in the ith period, Irrigation_i is the irrigation volume of the pond dam irrigation system in the ith period, Discharge_i is the discharge amount in the ith period of the pond dam irrigation system, and Loss_i is the loss amount in the ith period.

The Loss_i consists of Water surface evaporation WSE_i and penetration Pene_i

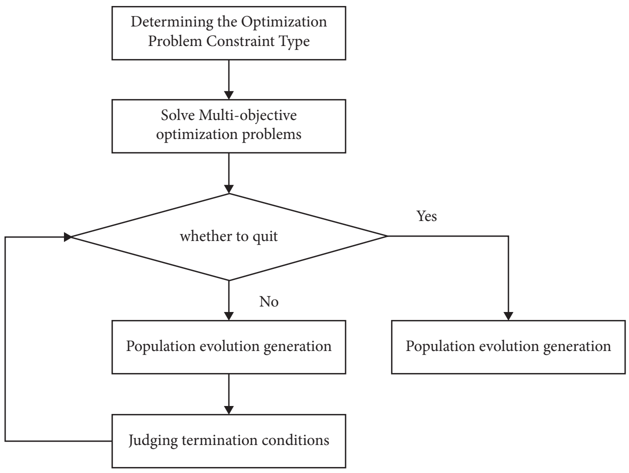

Figure 1: Chromosome initialization.

$$\text{Loss}_i = \text{WSE}_i + \text{Pene}_i. \tag{10}$$

In this study, the calculation of pond water volume and benefit adjustment is carried out in a monthly period. The specific calculation process is as follows:

(1) When $\text{Storage}_i + \text{Income}_i - \text{Irrigation}_i - \text{Loss}_i \geq \text{Storage}_{\max}$, the pond and dam system will abandon water, at this time, $\text{Irrigation}_i = \text{RX}_i$, $\text{Storage}_i = \text{Storage}_{\max}$. Among them, $\text{Storage}_{\max}$ is the water storage capacity of the pond, RX_i is the irrigation water demand of the crop i period, the specific formula is as follows:

$$\text{Irrigation}_i = \text{RX}_i = \frac{\sum_{j=1}^{n} R_{ij}}{\tau_i}, \tag{11}$$

where R_{ij} is the net irrigation water demand of the jth crop of the pond dam irrigation system in the i period, τ_i is the effective utilization coefficient of the irrigation water in the i period of the pond dam irrigation system.

(2) When $\text{Storage}_i + \text{Income}_i - \text{Irrigation}_i - \text{Loss}_i \geq 0$, $\text{Irrigation}_i = \text{RX}_i$, $\text{Storage}_i = \text{Storage}_i + \text{Income}_i - \text{Irrigation}_i - \text{Loss}_i$ the pond and dam system are irrigated normally.

(3) When $\text{Storage}_i + \text{Income}_i - \text{Irrigation}_i - \text{Loss}_i < 0$, the water supply of the pond and dam system cannot meet the needs of crop irrigation, and all the water stored in the pond and dam is used for irrigation. At this time, $\text{Storage}_i = 0$, $\text{Irrigation}_i = \text{Storage}_i + \text{Income}_i - \text{Loss}_i$.

The annual midday crop flood and drought ratio was used as the variable, and the minimum water abandonment, the minimum water shortage, and the maximum rice planting ratio were used as the objective functions, based on the aforementioned analysis of farmland irrigation water balance in Tangba Irrigation District.

The pond and dam irrigation system should minimize water scarcity, minimize wastewater generation, and

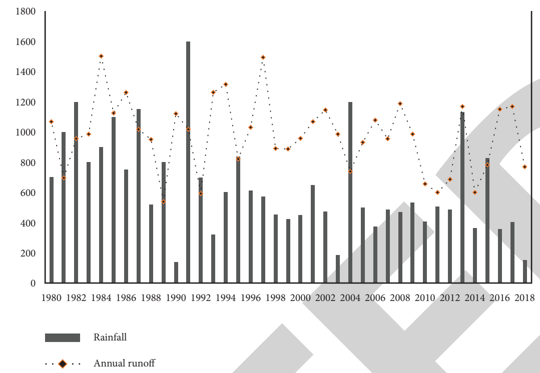

Figure 2: The annual runoff simulation results.

maximize rice sown area under the premise of meeting numerous constraints, in accordance with the principle of maximizing the use of water resources in the study area and reaping the maximum benefit from regional crop planting. It is classified as a problem of multi-objective optimization. Converting the multi-objective optimization problem to a single-objective optimization problem simplifies modeling and calculation for solving the optimization model. The objective function relationship that follows is the result of a careful analysis.

$$O = \min\left(\frac{\sum_{j=1}^{n} N_j + \sum_{j=1}^{n} \text{Discharge}_j}{\sum_{j=1}^{n} \text{RSA}}\right), \tag{12}$$

where RSA is the rice sown area, then the research goal of this article can be transformed into a single-objective optimization problem, and then the final model can be obtained by solving equations (4) and (5).

4. Experiment Results

Badou Town is located on the crest of the Jianghuai watershed in Anhui Province's northern Feidong County. It is a portion of the Jianghuai watershed. It encompasses 10,000 hectares of lush land and is home to 75,000 people, 71,000 of whom work in agriculture. It is a typical Midwest farming village. Surface runoff storage on a large scale is problematic in this area due to the fragmented topography and sparse vegetation, as well as the terrain's and vegetation's poor control and storage capabilities.

Guaranteed irrigation rates are low. In Badou Town's pond dam water storage irrigation area (Tangba Irrigation Land), there are 7,500 hm^2 of irrigation area with a total capacity of 93,200 cubic meters. The land is primarily planted with rice (middle rice or one-season late rice), corn, rapeseed, and wheat, with rice serving as the principal rotation crop (rape).

Rice cultivation is typically 0.5 the size of other autumn crops. Due to a lack of available water, the area is prone to drought, and the soil is barren. This irrigation system, which is located in the low-yield region of the Jianghuai hills, is characteristic of the pond and dam irrigation systems found across the Jianghuai hills. Rice agriculture is predominant in this region's Chongtian and Chongtian regions. According

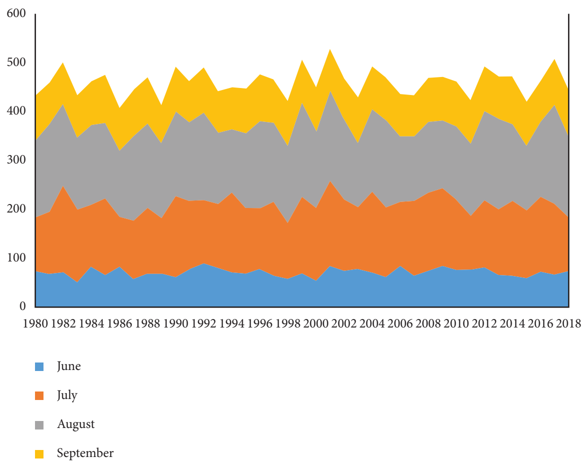

Figure 3: Monthly demand for middle rice.

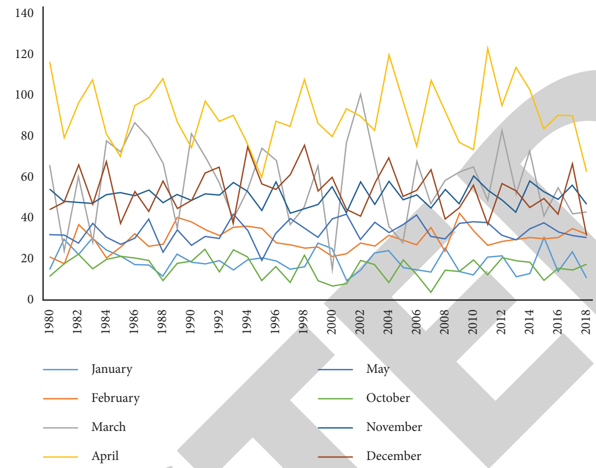

Figure 4: Monthly demand for middle rape.

to the survey's findings, Chongtian accounts for roughly 20% to 25% of total cultivated land area, whereas collapsed fields account for approximately 35% to 45%. The hillock is roughly comparable in size to Chongtian in terms of percentage. Around 7% of the total are small reservoirs and ponds.

Local villagers have been cultivating rice for generations, and the paddy field can be considered the permanent rice planting area in this area, accounting for around 20% of the total cultivated land area in this area. Rice can be successfully produced in this region. Rice planting area ratios typically range between 40% and 50% of the total planting area in ordinary years. High-collapse land often has a good soil texture and fertility level, making it suitable for a wide variety of agricultural plants. It is probable that the planting area will reach 60% or 70%.

The data in this article comes from the China Geographical Statistical Yearbook. The annual runoff simulation results are shown in Figure 2.

According to the research results of the contour map of water demand of major crops in Anhui Province, the standard crop coefficients and correction formulas of 84 crops recommended by FAO, and the irrigation experimental data of the Aoshihang Irrigation Experiment Station in Anhui Province and the Feidong Badou Irrigation Experiment Station for many years, determine the growth period of the main planted crops and the monthly crop coefficient β in the area where each station is located, calculate the reference crop evapotranspiration WD_0 by formula (7), and then calculate the water demand WD_c of different types of crops, as shown in Figures 3 and 4.

Figures 3 and 4 show that the research area's reasonable planting structure under the current pond capacity of $93{,}200\ m^3/km^2$ is as follows:

(1) When rainfall frequency exceeds 90%, the appropriate planting ratio of rice in the midday season is 0.11. Existing pond and dam projects are incapable of meeting agriculture water requirements during dry years. Rice should account for a lesser percentage of the crop.

(2) When rainfall occurs at a rate of 75% to 90%, the appropriate planting ratio of rice in the afternoon crop is 0.21.

(3) When rainfall occurs at a rate of 50% to 75%, the appropriate planting ratio for rice in the midday season is 0.36.

(4) When rainfall occurs at a rate of 20% to 50%, the appropriate rice planting ratio for the noon season crop is 0.54. Within this rainfall frequency range, this year's rainfall is quite abundant. If the rainfall distribution is reasonable, it should be possible to grow the maximum amount of rice possible in the area. Planting water requirements.

(5) When rainfall frequency is less than 20%, the suitable rice planting ratio for the noon season crop is 0.65, and this region is capable of meeting the water supply requirements for the maximum tolerable rice planting in the wet season.

Further, we tested the difference between the agricultural structure optimization scheme obtained by the traditional optimization method and the scheme obtained by the method in this article. We adopt MSE to judge the performance of different methods. The MSE of the traditional method is 66.73, while the method in this article is 16.52, which is significantly better than the traditional method.

5. Conclusion

There is still much space for improvement in Jianghuai's planting sector, and optimizing the planting structure not only promotes sustainable agricultural development and efficient water usage but also significantly enhances the agricultural economy. The balanced analysis of farmland submerged irrigation water is carried out in this article using the test results of Feidong Badou Irrigation Experiment Station. A genetic algorithm-based optimization model of agricultural industry structure is constructed using the simulation of rainfall and runoff in Tangba irrigation area.

Developing efficient water use and ensuring per capita food demand are critical practical guiding principles.

In the future, we will expand in two areas. First, we will extend the genetic algorithm to other areas of structural optimization. Second, we will introduce more advanced genetic algorithms to optimize the structure of the agricultural field.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares that he has no conflicts of interest.

Acknowledgments

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