Scholar Publishing Group
Academic Journal of Agricultural Sciences
https://doi.org/10.38007/AJAS.2022.030404
ISSN 2789-8415 Vol. 3, Issue 4: 47-59

Water Conservation Irrigation and Water Conservancy Engineering of Farmland under the Background of Rural Revitalization

Minglei Jiang*

Guangzhou City Construction College, Guangzhou, China

**corresponding author*

Keywords: Rural Revitalization, Water-Saving Farmland, Water-saving Irrigation, Water Conservancy Projects

Abstract: The sustainable development of resources is one of the challenges facing the world. However, China's water resources are very scarce, and high-efficiency water-saving irrigation projects are an important means to achieve the sustainable development of water resources, which deserves our in-depth study. The purpose of this paper is to discuss the development of farmland water-saving irrigation through the study of the quantity and distribution of water resources, the characteristics and laws of drought, the current status of farmland irrigation and water-saving, and a comprehensive understanding of the water conservancy construction and water-saving irrigation farmland in the research field. Support development, and analyzed the problems and deficiencies in water-saving irrigation technology and water-saving irrigation construction. Comprehensive evaluation of the benefits of water-saving irrigation in farmland using the method of donating materials and expert consultation, the economic, social and ecological environmental benefits of the project were evaluated and analyzed, and the evaluation results were analyzed and summarized. Up to 4%, with a satisfaction rate of 29%, through the combination of theory and experimental data, we have come up with a strategy to improve the efficiency of water-saving irrigation in farmland. The research results show that efficient water-saving irrigation enhances the irrigation capacity and improves the basic environment for crop growth. Increased agricultural productivity, maximized and rationalized benefits.

1. Research Background

Countries around the world recognize the importance of saving water [1]. However, due to the

level of economic development among countries, the advanced nature of science and technology, the status of water resources is even different. This makes the development and application scale of water-saving agriculture and irrigation technology vary greatly from country to country [2]. In the research and development of modern agricultural water-saving irrigation technology, some countries have made great achievements in the application of water-saving irrigation technology in agriculture after years of research and practice [3]. The utilization rate of agricultural irrigation water in these countries can reach 70% or higher.There is such a good irrigation utilization rate because they all use different irrigation technologies, such as scientific and modern micro irrigation and drip irrigation, as well as automatic and manual control technologies. Field, forming an advanced water-saving irrigation engineering system in different planting areas [4].

The total amount of water resources is determined, and a lot of human plunder will inevitably lead to the depletion of water resources. Agricultural development in Henan Province has always been constrained by water resources, especially in arid areas with small populations, large lands, and extensive planting areas [5]. However, due to shortage of water resources and uneven distribution, the development of local agriculture has been severely restricted. In recent years, Henan Province has continuously increased its water conservancy development and construction efforts, taking farmland high-efficiency water-saving irrigation as a strategic priority for grain production and expanding the area of farmland water-saving irrigation, which has played a huge role in alleviating the shortage of rural water resources and promoting the social and economic development of the province The role [6].

At present, the government has increased investment in farmland irrigation and water saving, and strengthened the construction of farmland water conservancy projects and related agricultural facilities [7]. Investment is not blind investment, but to better save resources and prevent food cuts and drought disasters [8]. It is necessary to realize the unification of economic benefits, social benefits and ecological and environmental benefits on the basis of energy saving [9].

This article uses methods such as donating materials and expert consultation to study the amount and distribution of water resources, drought characteristics and laws, the current status of farmland irrigation and water saving, and comprehensively grasp the situation of water conservancy construction in the study area and the current status of farmland water saving and irrigation. The support of water conservancy construction to the development of farmland water-saving irrigation, analysis of the problems and deficiencies in water-saving irrigation technology and construction; data processing through data recording, sorting, calculation, mapping, analysis, and farmland under the background of rural revitalization Research on water-saving irrigation and water conservancy projects related data statistical data sets for simulation, combined with data, empirical analysis of farmland water-saving irrigation benefits, and combined with effective data, summarize the methods to promote the sustainable development of ecological water resources and social economy. The results show that using this method, the efficiency is higher.

2. Theoretical Basis

2.1. Water Conservancy Project

Water conservation is the basic national policy of developed Western countries, and water conservation legislation is to restrict people's water behavior. Many countries have also introduced many encouraging policies and regulations to reward users and irrigation equipment manufacturers for their contribution to saving water, and provide institutional guarantees for saving water and water use. Adhere to continuous innovation, promote irrigation technology through scientific research and development, adhere to the development path of automation, refine and high-end technology of water-saving irrigation technology, promote the development of water-saving

agriculture and modern agriculture through the development of water-saving agricultural irrigation technology and products and Production equipment uses advanced agricultural technology to support the development of water-saving irrigation technology, especially water-saving irrigation technology[10]. In the implementation of irrigation technology, we must pay attention to policy guidance, rely on science and technology and the market, adapt to local conditions, and develop and develop energy-saving, environmental protection, and water-saving irrigation technology system models. Irrigation technology should adapt to the principle of water required for local crop growth and the current status of local farmland water supply. The application of modern farmland water-saving irrigation technology, combined with high-tech automatic control and manual control of irrigation timing and irrigation water consumption, and implement engineering and non-engineering measures. To form a complete irrigation system, we must make full use of various water resources in the region, and take into account the long-term social and ecological benefits[11-12].

The United States is a famous agricultural country in the world. The United States is not only advanced and developed in agriculture, but also in a leading position in various industries related to agriculture. These leading advantages come from the strong financial, human and material resources of the United States, advanced scientific and technological levels, superior natural climate and geographic location and other factors. The output of crops and livestock products in the United States is among the highest in the world. It is also one of the countries in the world where the development of water-saving irrigation technology is relatively advanced, the application of water-saving irrigation technology and the perfect water management system. Today, Israel is the country with the best and most popular agricultural water-saving technology in the world. Israel applied drip irrigation technology to different crops, such as tomatoes, grapes and peppers, which greatly increased the output of these cash crops. While applying sprinkler irrigation water-saving technology and drip irrigation water-saving technology, Israel applies modern electronic equipment to the production and development of irrigation equipment. Both sprinkler irrigation and drip irrigation can realize computer and network automatic control of equipment irrigation utilization. The water-saving irrigation system has the advantages of high degree of automation, convenient operation and precise control. Various irrigation programs are stored in the system memory. In the irrigation system, the irrigation time of each water pipe can be set according to the date, which greatly reduces the daily work of the operator and saves manpower. France and Spain attach great importance to the overall planning of their own water resources, and then carry out targeted regional surface water and groundwater resources management and the implementation of water-saving irrigation technology using computers for automatic control and dynamic monitoring according to the overall planning principles. In Spain, fruit trees use dropper technology to save water and increase production. The fixed nozzle technology has been widely used in field crops. France attaches great importance to groundwater resources, monitors and controls groundwater, vigorously develops technical irrigation technology, and pays attention to innovation and research and development of water-saving irrigation technology. According to the domestic situation, France attaches great importance to the development of sprinkler irrigation technology. Through continuous progress, a systematic water-saving system has been formed in a certain area. The transformation of traditional agriculture is just like the development and progress of modern agriculture. The average annual rainfall in different regions of Italy is more or less, and water resources are relatively scarce in many regions. Therefore, the application and development of water-saving irrigation technology in Italy has attracted much attention. While constructing various water conservancy projects, the government vigorously develops various water-saving irrigation technologies such as sprinkler irrigation, drip irrigation, and micro irrigation, and uses various water conservancy projects to cooperate with modern water-saving irrigation technologies for irrigation.

The most widely used water-saving irrigation technology in Italy is sprinkler irrigation technology, and many innovations have been made in the application of sprinkler irrigation technology to different crops. Crop sprinkler irrigation technology is closely related to China's economic development. Most of these projects are derived from previous theoretical research and experiments, and market demand has also promoted the development of water-saving irrigation. However, most of these projects are relatively small in scale, and no research results were collected at that time. Therefore, the actual water-saving benefits are not obvious. The application of water-saving irrigation technology has not kept pace with the times. China has a vast land area and cultivated land throughout the country. There is a big gap between the application and promotion of modern water-saving irrigation technology in various regions. Most of the crop irrigation uses traditional methods, using open channels to transport water fields, then traditional flood irrigation methods or artificial irrigation will cause a lot of water loss in every link, transportation and irrigation, resulting in a huge waste of irrigation water resources . In some areas, water-saving irrigation techniques are used to replace traditional irrigation methods. However, due to capital constraints, lack of understanding of water-saving technologies, and lack of familiarity with crop irrigation systems, the application of water-saving irrigation technologies has not kept pace with the times and other main reasons.The application of water-saving technologies lags behind the overall development level. Intelligent, cumbersome operation, water saving effect is not obvious.

After entering the 21st century, the water-saving irrigation technology developed in China's agricultural field has also been greatly promoted and developed. However, in the development of water-saving irrigation technology in many areas, it is observed that the application of water-saving irrigation technology in this field is not practical, and the water-saving irrigation technology measures are not clear enough, leading to this fact despite the fact that water-saving irrigation projects have been completed Cultivated land, the actual application is to hook up hands and feet, which is very poor in operability and water saving effect.More importantly, the economic effect of project investment is not obvious, which will also lead to an embarrassing situation afraid of using traditional irrigation. Wastewater methods, but the use of water-saving irrigation projects do not work, so agricultural practitioners have resisted the development and application of water-saving irrigation technology, leading to the loss of results. Through analysis, the reason for this result is that in the construction of water-saving irrigation systems, initial work is insufficient, local natural conditions and human conditions are not fully understood, and there is no communication with local farmers on the ground, all of which are on paper, Cause waste of funds and water resources. Funds for the construction of water-saving irrigation projects are insufficient, and there are certain gaps in the economic development level of various regions. When local governments at all levels want to apply water-saving irrigation technology to construct water-saving irrigation projects in local agricultural areas, they will be more or less restricted by funds. In many local agricultural areas, there is a problem of insufficient funds when developing water-saving irrigation technologies. There is no way to reduce the engineering design standards in the early stage. During the construction process, the purchased water-saving equipment is of poor quality, poor durability, and high maintenance costs. After the project is completed, the water-saving irrigation level cannot meet the national standard, and it cannot be used when farmers use the water-saving irrigation system in the field. In recent years, the popularity and application of the Internet has changed people's lives. People can get a lot of information on the Internet to learn a lot of knowledge. The development and popularization of water-saving awareness in China has formed a general consensus on water-saving in life. However, in some areas, the agricultural practitioners' awareness of water saving in farmland irrigation is still relatively weak, resulting in low awareness and subjective acceptance of water-saving irrigation technology. People in many areas have more traditional ideas. The reason why water-saving irrigation is not accepted by people is because many

farmers think that using water-saving irrigation to irrigate farmland is a very complicated process, and the operation of water-saving irrigation equipment is also very complicated. Efforts to achieve: First, innovative farmland water conservancy construction management systems and mechanisms. In accordance with the principle of promoting water conservation, reduce the expenditure of farmers, and ensure the good operation of irrigation and drainage projects, and promote the comprehensive reform of agricultural water prices.

2.2. Water-Saving Irrigation

Water resources are one of the most important material resources and an important factor to consolidate agricultural development. Water is the source of life, and about one third of the world ’s population suffers from severe water shortages. The traditional irrigation method of farmland in China is flood irrigation. Although the crops in an area are irrigated with sufficient water resources, this irrigation method loses a lot of water that can be used sparingly. In addition, the waste of agricultural water resources is also reflected in the low utilization rate of agricultural irrigation water. Advanced water-saving irrigation technology is not popular, and few people are willing to invest in the introduction of a scientific water-saving irrigation technology system. The purpose of applying modern water-saving irrigation technology in agriculture is not to reduce water consumption as much as possible, but to improve the utilization efficiency of farmland irrigation water. The core meaning of water-saving irrigation technology is the multi-purpose utilization of water resources. In addition, the development of water-saving irrigation technology is a new application of various irrigation technologies. Compared with ancient farmland irrigation methods, modern scientific water-saving irrigation technology has the advantages of significantly reducing water consumption and significantly improving the utilization rate of irrigation water. Modern water-saving irrigation technology can be divided into engineering technology and agricultural technology according to the application concept and specific application situation. Generally speaking, irrigation is to irrigate farmland with water. In order to ensure the crops with large amounts of water required for normal growth and obtain high stable income, it is necessary to provide sufficient water for the crops And soil moisture content. Under natural conditions, due to insufficient precipitation or uneven distribution, the crop water demand cannot be met. Therefore, it is necessary to make up for the shortage of natural rainfall through artificial irrigation. Water-saving irrigation is a universal concept and a long-term technical concept. It is an irrigation method that realizes the normal agricultural production with the lowest water consumption cost according to the crop water demand law and local water supply conditions. In order to obtain the best economic and ecological benefits for agriculture, various measures have been taken to effectively use natural precipitation, surface water and groundwater. Water-saving irrigation technology is the general term of irrigation technology with as little water as possible. Compared with traditional irrigation technology, it can significantly save water resources and use water resources more effectively. Its technical concept is to use as little water as possible to irrigate as many crops as possible, thereby maximizing the water use efficiency and obtaining more crop yields.

Farmland crop irrigation system refers to determining the reasonable number of irrigation times, irrigation time, irrigation quota and other factors by studying the irrigation frequency, irrigation time and irrigation water volume of the entire physiological cycle of farmland crop cultivation. China's research on crop irrigation systems is relatively backward. To optimize and upgrade the existing crop irrigation system, it is necessary not only to study the law of crop growth under high water conditions, but also to consider the water law required for crop growth under drought conditions. In an irrigation cycle, the ratio of the total amount of water that can be used by crops in the irrigation unit to the total amount of water obtained by the irrigation system from the water

source is called the irrigation water use coefficient. This coefficient is an important indicator to measure the degree of water resource utilization from the irrigation water source to the field crop water absorption and utilization. This is a comprehensive indicator that can reflect the advancement and adaptability of irrigation technology in the irrigation area in a timely manner. It is an important reference for the popularization and application of water-saving irrigation technology in farmland, and it is also an intuitive basis for determining the development level of water-saving technology in some areas.

There are three main water-saving irrigation techniques: channel lining and seepage prevention. Channel anti-seepage technology is widely used, with the advantages of easy operation, convenient promotion, low project cost and obvious investment benefits. The disadvantage is that the land leveling requirements are higher and the project covers a larger area. Pipe irrigation. The traditional irrigation method is to supply water from the pumping station and transport it to the field through pipes. Its advantages are simple project management, low cost, and good crop adaptability. The disadvantages are low water-saving efficiency and high requirements for land leveling. Micro irrigation mainly includes drip irrigation technology and micro spray technology. This technology is one of the most water-saving advanced irrigation technologies in modern irrigation technology. The water is filtered through pipes and drip irrigation devices and drip irrigation into the plant root system. Micro-irrigation technology has a series of advantages such as water saving, energy saving and yield increase, especially to improve crop quality. Under the condition of satisfying the water demand of crops, improve the quality of crops, increase the economic income of farmers, increase the gold content of crops, and promote the development of urban modern agriculture driven by water economy. Construct water storage projects such as tang dams and ponds in areas with suitable terrain, control target exploitation, develop groundwater reasonably, and improve water resources protection capacity; rationally plan rice cultivation, promote shallow water irrigation technology, and focus on seedling agriculture, export-oriented agriculture, and fruits , Fungi, special livestock and other ecological agriculture; construction of water-saving irrigation projects based on channel imperviousness and pipeline irrigation, covering agricultural water-saving measures such as water-saving, water and fertilizer coupling, and chemical prevention; restricting low-level livestock and poultry breeding and development Large-scale aquaculture and coastal aquaculture; perfect the grassroots service system with farmers' water association as the main body, strengthen capacity building, and increase water-saving awareness.

3. Experiment

3.1. Research Contents

Randomly choose to investigate and study the basic conditions of farmland water conservancy construction in 15 rural areas of Henan Province, analyze the current situation of farmland water conservancy construction in the current situation, the problems in farmland water conservancy construction in rural areas, the benefits of farmland water conservancy construction in rural areas, Countermeasures and suggestions for farmland water conservancy construction.

3.2. Experimental Plan

(1) On-site investigation. After consulting many relevant documents, the evaluation, collation and analysis of the water-saving effects of farmland irrigation, found the research fields required by the data and carried out on-site investigations, extensively collected the basic data of natural conditions, social and economic conditions, water conservancy project construction, farmland water-saving irrigation The status quo and management of farmland irrigation water in rural areas

of our province.

(2) System analysis. On the basis of field investigation, the collected data is analyzed systematically, and finally processed to provide data support for the evaluation. Find out the problems and deficiencies of local water-saving irrigation and establish an objective index evaluation system.

(3) Expert consultation. On the basis of mastering the main factors, there are generally water-saving benefits that promote and restrict farmland irrigation in rural areas.Consult experts in the field of water-saving irrigation to scientifically determine evaluation indicators that affect economic benefits, social benefits, and ecological and environmental benefits. Irrigation and water saving.

(4) Investigation and research method. Including discussions, interviews, questionnaires, etc. This paper investigates the current situation of rural water conservancy construction in Henan Province, and collects and analyzes relevant data.

(5) Literature data method. According to the needs of theme selection, search relevant literature materials through databases such as China HowNet and China Journal Network, a large number of books, papers, research reports and other materials consultation, after sorting, form a literature review and analysis to provide further research for the paper Theoretical basis. Learn from the excellent results of water conservancy construction in other regions at home and abroad, sum up the experience and lessons, and avoid detours in the research.

(6) Experience summary method. The collected data and experimental research results mainly use the method of experience summary to explore the methods and means of carrying out farmland water conservancy construction.

4. Experimental Results

4.1. Rural Water Supply Survey

(1) Water supply capacity

Table 1. Water supply capacity

Engineering category	Average water collection (10000 m3)	Effective water diversion volume (10000 m3)	Available water supply (10000m3)
Medium-sized	44.39	197	295
Small-scale	109.5	169	301
Pond	300.8	187	284
Water storage works	350.4	400	177
Diversion weir	105.7	104	104
River Irrigation	195.2	195	195
Other	231.9	231	231

According to the statistical analysis of the data, as shown in Figure 1 and Table 1, the average water intake of the diversion weir in the engineering category is 1.057 million cubic meters, the effective diversion volume is 1.04 million cubic meters, and the available water volume is 1.04 million cubic meters. The average water intake of medium-sized canals is 443,900 cubic meters, the effective diversion volume is 1.97 million cubic meters, and the available water volume is 2.95 million cubic meters. The average water intake of small-scale canals is 1.095 million cubic meters, the effective diversion volume is 1.69 million cubic meters, and the available water volume is 3.01

million cubic meters. The average water intake of the pond is 3.008 million cubic meters, the effective diversion volume is 1.87 million cubic meters, and the available water volume is 2.84 million cubic meters. The average water intake of the water storage project is 3.504 million cubic meters, the effective diversion volume is 4 million cubic meters, and the available water volume is 1.77 million cubic meters. The average water intake of river irrigation is 1.952 million cubic meters, the effective diversion volume is 1.95 million cubic meters, and the available water volume is 1.95 million cubic meters. Other average water intake is 2.319 million cubic meters, effective water diversion is 2.13 million cubic meters, and available water is 2.13 million cubic meters.

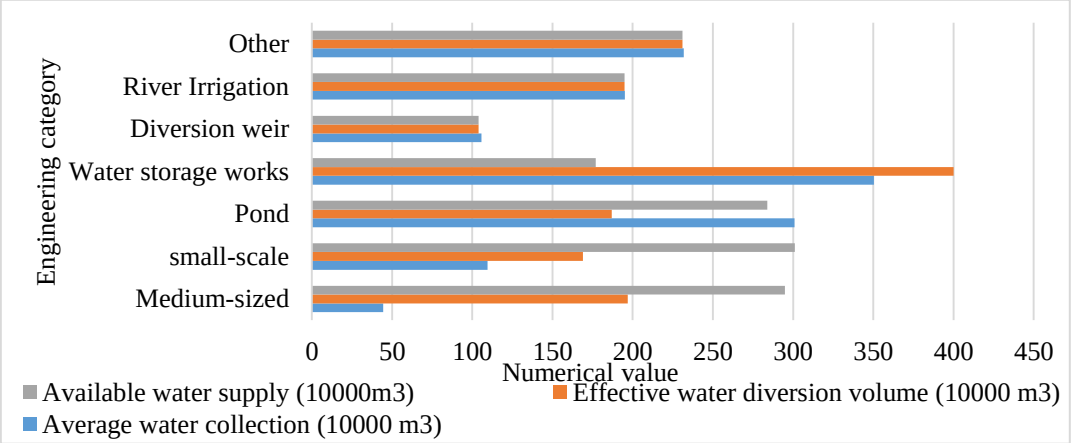

Figure 1. Water supply capacity

Balanced water supply:

Table 2. Balanced water supply analysis

Index	Water demand	water supply	Surplus water shortage	Remaining water shortage rate
Primary balance	834	717	-110	-14%
Two balance	581	548	-127	-16%
Three balance	512	800	135	20%

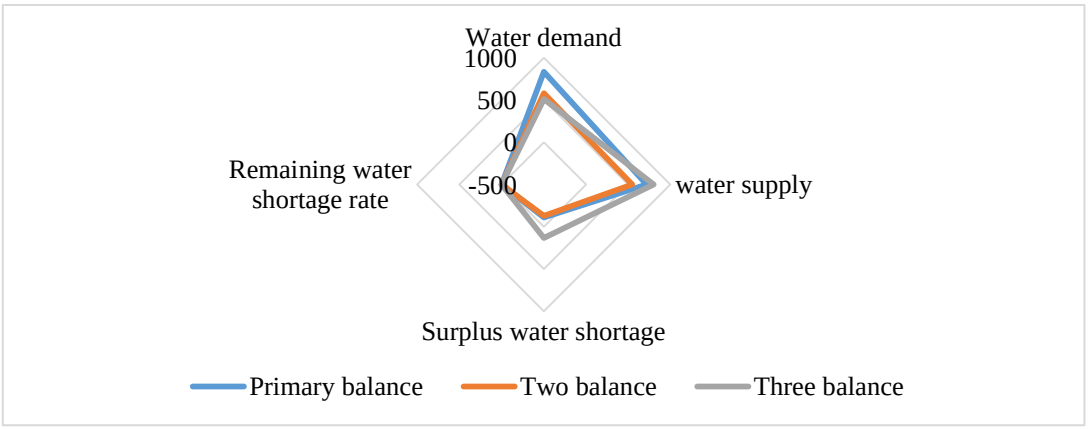

Figure 2. Balanced water supply analysis

According to the statistical analysis of the data, as shown in Figure 2 and Table 2, the water demand, water supply, residual water shortage and residual water shortage rate of the primary balance, secondary balance, and tertiary balance are 8.34 million cubic meters and 7.17 million cubic meters respectively. Meters, -1.1 million cubic meters, -14%, 5.81 million cubic meters, 5.48 million cubic meters, -127 million cubic meters, -16%, 5.12 million cubic meters, 8 million cubic meters, 1.35 million cubic meters, 20%.

4.2. Water Saving Planning Results

(1) Water saving in agriculture

Table 3. Analysis of agricultural water saving

Particular year	Effective irrigation area	Water saving irrigation area	Efficient water-saving irrigation area	Irrigation water consumption per mu	Water saving irrigation project area ratio
2015	225.9	72.1	41.5	316	31%
2019	327.5	293	192.6	191	88%

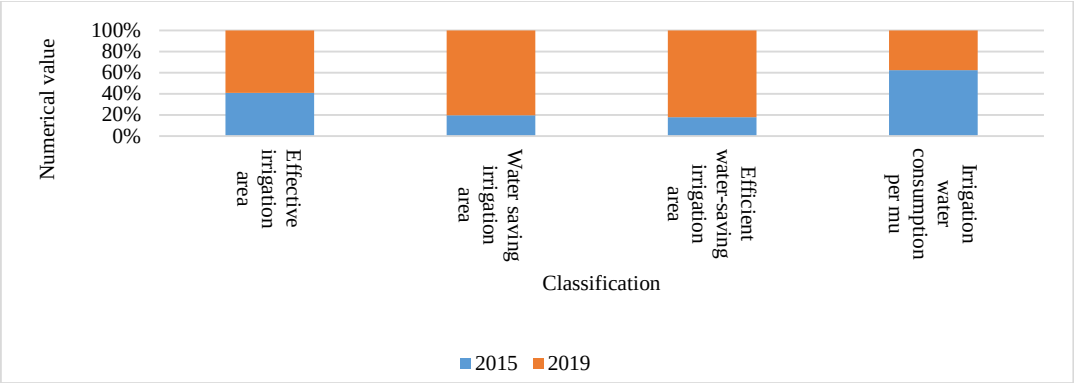

Figure 3. Analysis of agricultural water saving

According to statistical analysis of the data, as shown in Figure 3 and Table 3, in 2015, the effective irrigation area was 2.259 million cubic meters, the water-saving irrigation area was 721,000 cubic meters, the efficient water-saving irrigation area was 415,000 cubic meters, and the average irrigation water consumption per mu was 3.16 million. Cubic meters, water-saving irrigation project area ratio 31%, high-efficiency water-saving irrigation area ratio 18%, irrigation water utilization coefficient 0.48. Effective irrigation area in 2019 is 3.275 million cubic meters, water-saving irrigation area is 2.93 million cubic meters, efficient water-saving irrigation The area is 1.926 million cubic meters, the average irrigation water consumption per mu is 1.19 million cubic meters, the area ratio of water-saving irrigation projects is 88%, the area ratio of high-efficiency water-saving irrigation is 58%, and the irrigation water utilization coefficient is 0.69.

(2)Planning benefits

According to statistical analysis of the data, as shown in Figure 4, the proportion of irrigated area is increased by 6%, people's satisfaction is 46%, economic development is up to 1%, people's satisfaction is 66%, and the quality of rural life is increased by 18 %, People ’s satisfaction is 37%, water saving rate is 4%, people ’s satisfaction is 29%, energy saving rate is 1%, people ’s satisfaction is 58%, saving rate is 15%, people Its satisfaction rate is 48%, land saving rate is 13%, people's satisfaction rate is 80%, impact on local ecological environment is 7%, and people's satisfaction rate is 73%.

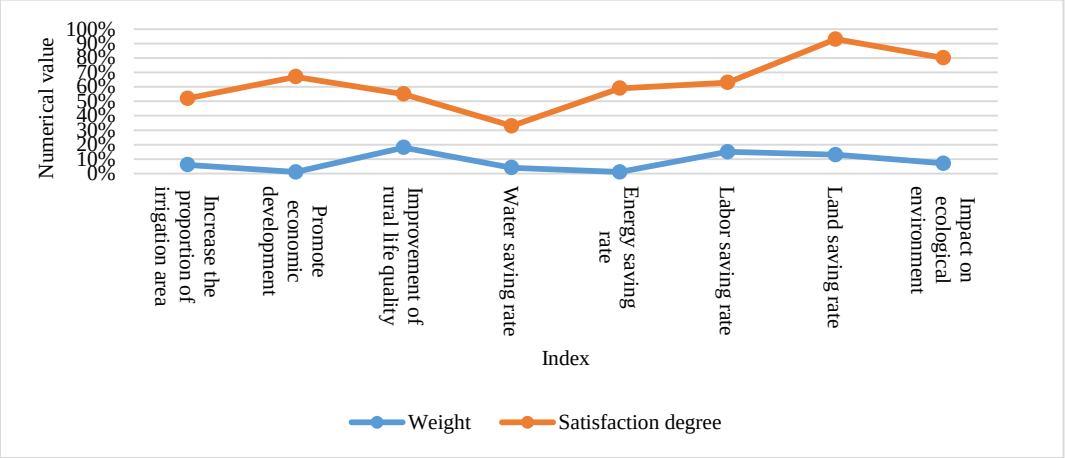

Figure 4. Planning benefit analysis

5. Analysis and Discussion

5.1. Analysis of Experimental Results

At present, the ratio of economic benefit to cost, water-saving irrigation area accounts for the total irrigation area and the weight value utilization rate of water conservancy projects are relatively high, that is to say, the impact on economic benefits is relatively large, but the scores of these indicators are relatively low The angle index score. The most important factors that affect the efficiency of water-saving irrigation are the degree of utilization of water-saving irrigation projects, the effective utilization coefficient of irrigation water, the increase of individual farmers' production and income, the impact on the local ecological environment and the impact on water resources. It can be seen that the investment and recovery benefits of water-saving irrigation projects, the degree of utilization of water conservancy projects, the effective use of irrigation water, the promotion of technology and the actual interests of farmers, and the impact on water resources and ecological resources are the main influencing factors. Benefits of water irrigation.

By analyzing the balance of water resources in the base year, the water supply and demand are analyzed for three different planning level years, and the problems found in the development and utilization of the main water resources are analyzed under the current conditions. Water supply capacity. First-level supply and demand analysis: Under the current water-saving conditions and the status quo of water resources development and utilization, analyze the supply-demand balance of each planning level year. Analysis of secondary supply and demand: consider strengthening the water saving of the project, adjusting the agricultural structure, and deepening the water saving potential of agricultural measures. The third analysis of supply and demand: on the basis of the second analysis of supply and demand, consider the new water supply capacity after planning measures such as water storage projects, rainwater collection projects, reclaimed water reuse, and rational development of groundwater. On the basis of expanding the irrigation area, make full use of unconventional water sources, and vigorously develop efficient water-saving agriculture. Adjust the agricultural structure, deepen agricultural water saving, improve management level, and achieve the goal of "open source and reduce expenditure". Rural areas have problems such as water shortage, scattered farmland, low degree of mechanization, large total water consumption, and small farmland area, and have adopted channel anti-seepage measures.

Through field investigation, it is found that the investment in agricultural water management in some areas is insufficient, and the importance of farmland irrigation water management is not enough. At present, the utilization rate of surface water resources development is relatively high.

Increase the number of water conservancy projects in the planned area and improve the agricultural water supply capacity. The water supply capacity planning of diversion projects such as new weirs (sluices) and pumping stations has been significantly improved. Therefore, to promote the construction of water-saving technologies and water conservancy projects, we must fully consider the local water resources environment, natural climate conditions, cultivated land conditions and crop growth conditions, as well as the recognition of local people to promote the sustainable development of local water resources and ecological and environmental resources As the core, to promote farmers to increase output and income as the goal, and to plan and budget for technical projects, on the one hand, it can achieve the later target benefits and achieve a real harvest effect; on the other hand, it can do a good job of budgeting and avoiding capital Of waste or the extension of the project cycle due to lack of funds.

5.2. Discuss

Therefore, the current proportion of water-saving irrigation area in the total irrigation area is too low, it is necessary to significantly increase the proportion of water-saving irrigation area and increase the proportion of irrigation area. One is to continue to increase capital and technical investment to achieve full coverage of water-saving irrigation in the central and western regions; the second is to establish a strict agricultural water management system, strengthen water management, increase the utilization rate of water conservancy projects, and continuously improve water productivity; third , We need to avoid image projects, do a good job plan and budget, pay attention to the economic benefit cost ratio at the beginning of the month, and the fourth is to allow farmers to accept and adapt water-saving irrigation technology to improve crop yields and farmers' income from the micro level to achieve Improve economic efficiency at the macro level. The application and promotion of water-saving irrigation technology can not only bring significant economic benefits, but also have good social benefits and ecological and environmental benefits. It can meet the requirements of water conservancy modernization.Regional agricultural structural adjustment and a good water resources management system can bring local farmers a good social benefit such as increasing production and income, improving rural life quality, and promoting local economic development. Will save a lot of water resources, electricity, cultivated land, and will bring good ecological benefits to groundwater, groundwater and the local natural ecological environment. Compared with high-level, wide-range and high-efficiency farmland water-saving irrigation areas, there is still some improvement potential. Social benefits and ecological and environmental benefits should not only be accompanied by the simultaneous development of economic benefits, but also have their own development goals and models, and good social benefits and ecological and environmental benefits can also promote economic benefits to promote the comprehensive benefits of water-saving irrigation in the central and Western Region. On the basis of increasing investment, strengthening water resources management, further changing water use, irrigation area channel anti-seepage and irrigation technology, promoting large-scale dryland water-saving irrigation, focusing on learning, continuously accelerating water-saving irrigation of farmland, and comprehensively improving comprehensive benefits of water-saving irrigation farmland.

We should pay more attention to the rational layout of water conservancy projects and change from extensive to intensive use of agricultural water. This requires the government to pay attention to project construction and technology promotion while doing a good job in planning and layout. On the one hand, it is necessary to comprehensively analyze the water resources carrying capacity, labor force population status, social development scale, social and economic structure, agricultural water use scale, ecological water resources and other central and western regions in arid areas, so as to rationalize construction, widely apply and develop On the basis of comprehensive control; on the

other hand, we must continue to expand the effective irrigation area, widely promote channel anti-seepage measures and construction, change the management model, transform the individual farmers into farm management, and continuously improve the degree of mechanization. According to the degree of water shortage, establish water-saving irrigation technology suitable for local farmland to promote the transition from extensive water use to intensive water use.

Governments at all levels should pay attention to agricultural water management, increase investment in manpower, material and financial resources, and improve irrigation water management. One is to effectively use talents, introduce water management technical personnel, training and learning, improve the quality of water management personnel, and improve the soft power of water management; second, increase capital and equipment investment, introduce advanced water management equipment, and improve the effective use of farmland irrigation water Coefficient and water productivity; the third is to continuously improve the local farmers' water-saving awareness, so that farmers from passive to active water-saving, truly achieve efficient water-saving, efficient water use, sustainable development of water resources. On the basis of strengthening the management of farmland water-saving irrigation water, we should establish and improve the dynamic monitoring system of farmland water-saving irrigation area, so as to realize the monitoring of irrigation water quality, groundwater resources, the quantity and distribution of water resources in ecological irrigation areas, and achieve effective water supply And replenishment, and ensure the sustainable use of water resources and ecological resources, and maximize the use of water conservancy projects. Combined with the actual situation in the region and the needs of crop growth, new technologies for water-saving irrigation were introduced or invented to realize the transition from traditional farmland irrigation to efficient water-saving irrigation. In the transformation and application of irrigation technology, we should also aim at low cost and high income, with the concept of low carbon and environmental protection, using some raw materials to reduce pollution, green environmental protection and strong sustainable use of materials and equipment in the development of water-saving irrigation in farmland And to achieve sustainable development of materials and equipment for water-saving irrigation farmland.

6. Conclusion

(1) Strengthening water conservancy construction is an important measure to improve the comprehensive agricultural production capacity and promote the sustained and stable growth of farmers' income.

(2) The implementation of farmland water conservancy projects will help increase farmers' property income. Lay a solid foundation for building a new socialist countryside.

(3) Continue to promote the application of technology, mobilize the enthusiasm and enthusiasm of farmers to adopt water-saving irrigation technology, continue to increase investment and construction, continue to increase the proportion of water-saving irrigation area in rural areas, and achieve a substantial increase in food production and economic development And the quality of life of farmers, speeding up the process of agricultural modernization.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

References

[1] Gao, Shikai, Yu, Shuang'en, Wang, Mei, Cao, Ruizhe, & Guo, Rong. (2017).“ Effect of Controlled Irrigation and Drainage on Saving Water and Reducing Nitrogen and Phosphorus Loss in Paddy Field under Alternate Drought and Flooding Condition”, Transactions of the Chinese Society of Agricultural Engineering, 33(5), pp.122-128.

[2] Luo, Y., Fu, H., Xiong, Y., Xiang, Z., Wang, F., & Bugingo, Y. C., et al. (2016).“ Effects of Water-Saving Irrigation on Weed Infestation and Diversity in Paddy Fields in East China”, Paddy & Water Environment, 15(3),pp. 1-12.https://doi.org/10.1007/s10333-016-0577-4

[3] YAN Xiao-li, JIA Li-ming, & DAI Teng-fei. (2018).“ Effects of Water and Nitrogen Coupling under Drip Irrigation on Tree Growth and Soil Nitrogen Content of Populus × Euramericana Cv. ‘Guariento’”, Chinese Journal of Applied Ecology, 29(7),pp. 2195.

[4] Miao, Z., Chu, L., Xiao, M., & Cai, B. (2017).“ Advances in Effect of Water-Saving Irrigation on Physiological and Biochemical Characteristics of Tea”, Journal of Drainage & Irrigation Machinery Engineering, 35(6),pp. 515-519.

[5] Du, Yadan, Zhang, Qian, Cui, Bingjing, Gu, Xiaobo, & Niu, Wenquan. (2017).“ Effects of Water and Nitrogen Coupling on Soil n2o Emission Characteristics of Greenhouse Celery Field under Aerated Irrigation”, Nongye Gongcheng Xuebao/transactions of the Chinese Society of Agricultural Engineering, 33(16),pp. 127-134.

[6] E.C. Mantovani, G.G. Faccioli, B.G. Leal, A.A. Soares, & P.S.L. Freitas. (2018).“ Influence of the Water Distribution Uniformity and Irrigation Depth on the Yield of Irrigated Bean Crop”, Irriga, 14(4),pp. 431-440.https://doi.org/10.15809/irriga.2009v14n4p458-469

[7] P. S. K. Pelpitiya, N. D. K. Dayawansa, & E. R. N. Gunawardena. (2016).“ Impacts of Land Cover Dynamics and Shallow Groundwater Abstraction on Sustainability of Hakwatuna Oya Irrigation System”, Tropical Agricultural Research, 27(1), pp.13.https://doi.org/10.4038/tar.v27i1.8150

[8] Y. Fan, X. Yan, H. Zhang, H. Pang, & J. Shi. (2017).“ Suitable Evaluation for Crops and Water-Saving Irrigation Methods for Arable Sandy Land in Inner Mongolia”, Transactions of the Chinese Society of Agricultural Engineering, 33(21),pp. 115-127.

[9] Junya Wei, Guoyin Liu, Debing Liu, & Yeyuan Chen. (2017).“ Influence of Irrigation during the Growth Stage on Yield and Quality in Mango (Mangifera Indica l)”, Plos One, 12(4),pp. e0174498.https://doi.org/10.1371/journal.pone.0174498

[10] Xiaoyin Liu, Junzeng Xu, Shihong Yang, & Jiangang Zhang. (2018).“ Rice Evapotranspiration at the Field and Canopy Scales under Water-Saving Irrigation”, Meteorology & Atmospheric Physics, 130(9),pp. 1-14.https://doi.org/10.1007/s00703-017-0507-z

[11] Yingyu YAN, & Juyan LI. (2016).“ Cotton's Water Demand and Water-Saving Benefits under Drip Irrigation with Plastic Film Mulch”, Asian Agricultural Research, 08(4),pp. 32-36.

[12] Hang Chen, Zhongyi Liu, Zailin Huo, Zhongyi Qu, & Alexander Fernald. (2016).“ Impacts of Agricultural Water Saving Practice on Regional Groundwater and Water Consumption in an Arid Region with Shallow Groundwater”, Environmental Earth Sciences, 75(16), pp.1204.https://doi.org/10.1007/s12665-016-6006-6