Journal of Research in Multidisciplinary Methods and Applications (JRMMA)
ISSN: 2957-3920, Volume 1, Issue 1, May 2022

The Application of Irrigation and Water Conservancy Design in Land Consolidation

Liu Zhongxian*, Wu Yongbo, Yang Sheng, Yang Shenggang, Li Song

Guizhou Water Resources and Hydropower Survey, Design and Research Institute Co., Ltd, China, 550000

**Corresponding to: Liu Zhongxian, 1051941667@qq.com*

Abstract: ***For land consolidation, irrigation and water conservancy, design and management plays an important role in it, but it also become the main subject of related workers, the design needs certain comprehensive and various design specification, engineering planning and other related content, in order to promote the development and progress of our agriculture, one must pay attention to irrigation and water conservancy design and management, make it can play a certain role to ensure the stable land consolidation.***

Keywords: land consolidation; irrigation and water conservancy design; management

1 Introduction

The problems existing in the area of irrigation and water conservancy design includes,

(1) Problems existing in the planning and design

Irrigation and water conservancy design is usually divided into these several processes, scheme design, preliminary design, drawing design and later design, in the process of design, need to pay attention to the quality of the project, which not only affect the project cost, also in the process of construction quality and late management and service plays a great role. However, in the past, the following problems mainly existed in the design process, The first, I say, For the county level, Irrigation and water conservancy design has long been unable to meet the relevant requirements of construction, As the planning of irrigation and water conservancy is gradually changing in recent years, The state has invested so heavily in it, The content of the construction is also expanding accordingly, The current county-level irrigation and water conservancy construction cannot meet the current standards and requirements, Corresponding planning and design should be carried out according to the specific situation; Second part, The simultaneous design and construction used in the past lead to different degrees of problems in most projects, for example, Unrelated facilities, material quality and other related problems, Gradually reduce the practical application effect of water conservancy projects; 3; Third, Most of the irrigation in the design of the process, Lack of insight and investigation of the local specific conditions, The direction of the research is not clear enough, cannot meet the actual needs of today's agricultural economic development.

(2) Problems existing in the construction management

Construction management is an important part to ensure the smooth progress of water conservancy projects, which directly affects the quality of the project. According to relevant statistics, the impact of construction management on the quality of the project is the most, far higher than the impact of planning and maintenance on the project quality. But, Because some irrigation and water conservancy projects are small scale, Affected by the different factors, There are different degrees of problems in the actual construction process, It is mainly reflected in one thing, Construction units are lacking in technology, Lack of advanced construction technology and a team, Failure construction according to relevant design standards and requirements, During the construction process, Unable to effectively ensure the quality of each construction link, Quality management is too dependent on supervision to some extent, Thus cannot effectively ensure the construction process; Second part, Lack of certain supervision over the overall project, Problems arise from materials to construction, The material is not up standard in quality, More serious is the occurrence of cutting corners, Greatly reduce the service time of the works, Have a serious impact on the quality of the project; 3; Third, The management mode and irrigation and water conservancy projects cannot be coordinated accordingly, Unable to effectively improve the initiative of the villagers, Adverse impact on the progress of the project.

2 Practice content of irrigation and water conservancy design in land consolidation

(1) Design of farmland irrigation channels

In the process of land consolidation, it is necessary to distinguish the water source of pipe irrigation and canal irrigation. The water source of canal irrigation should be the main irrigation canal, and the groundwater is used as the auxiliary. At the same time, the original or newly built motor well is needed, so that it can be set beside the road to facilitate management and irrigation. There are many ways to choose for irrigation, in this process, more application is the U canal and rectangular canal [1]. In the practical application process, U-shaped canal is relatively large in water transmission, and can play a good water saving effect, has certain advantages in leakage prevention, but has high requirements for construction technology; for rectangular canal, the advantage can save land area, but for the channel material, so high price. In the process of designing the U-type groove channel, if there are regulations for the model, it needs to be selected and applied according to the requirements, and the model also has the corresponding thickness, which needs to pay some attention to this aspect. In the process of irrigation and water conservancy design, it is necessary to understand the specific situation of the project in detail, so as to facilitate the corresponding design of the project, so as to choose a reasonable irrigation channel.

In the construction of water distribution channels, the pipeline design needs to combine the actual area of farmland and terrain environment and other related aspects, must be detailed according to the overall study, to choose the appropriate channels for the corresponding setting, but also need to conform to the conditions of farming and the requirements of water conservancy facilities. Under normal circumstances, the construction of water transmission

channels is mainly carried out according to the corresponding standards. The function of the corresponding channels at each stage must be taken into account, and the scientific construction should be carried out combined with the calculation of relevant contents under the existing conditions. In the process of construction of water distribution channels, also need to pay attention to the related construction content, according to the overall construction and the specific situation of the corresponding adjustment, this requires the relevant staff to comprehensive analysis and research, the maximum cost control, choose suitable irrigation methods, realize the scientific channel construction.

(2) Channel anti-seepage construction design

In order to prevent leakage, channel, waterproof layer can be set up to prevent leakage design in advance. Land consolidation requires relevant departments to carry out corresponding plans and formulate appropriate plans according to the actual situation. The leakage prevention design of irrigation and water conservancy must be carried out in combination with the local ecological environment. At the same time, the scale of the irrigation area should be fully considered and the irrigation and water conservancy design scheme should be analyzed scientifically. In the design process, it is necessary to choose the materials and the engineering setting, and the corresponding judgment needs to be made after the field investigation, so as to make the irrigation channel conform to the regional ecological environment to the greatest extent [2]. In the design of leakage prevention, the asphalt mat can be used. The specific application is to apply asphalt on the linen and reed mat, so that it can become a coil. In the process of laying channels, asphalt can be used to effectively glue the gap, prevent the leakage of the channel, and effectively improve the use time of the channel. On the other hand, in the construction process of leakage prevention, frozen swelling and deformation joints can be set.

(3) Channel drainage design

For the design of irrigation and water conservancy projects, there are a variety of farmland irrigation methods, including sprinkler irrigation, micro-irrigation and other different ways, which need to be fully considered in the process of irrigation and water conservancy design. While applying the irrigation method, it is also necessary to take into account the specific situation of the local farmland and the surrounding environment. To be more specific, it needs to grasp the farmland location, water source, soil quality and other aspects in detail, and the relevant staff need to go to the local area for the corresponding investigation and research. According to different aspects, fully take all factors into account, you can choose the machine well, in the process of setting the pipe network, you need to set it accordingly according to the width of the land [3]. In the design, it is necessary to fully connect the irrigation design, so as to continuously improve and improve the relevant drainage design, so that it can play an important role in the farmland, play the effect of waterlogging and waterlogging prevention, and prevent soil salinization to a certain extent. In the process of land consolidation, if the location of the farmland is different, the drainage facilities according to the actual situation should be designed according to the impact of the environment. In the process of drainage design, such as ditches with cross effect design, it must be fully considered to prevent certain harm to farmland in disasters. The water sources used in drainage are mainly surface water, groundwater and so on. It should be noted that for different water sources, different drainage methods should be selected to gradually improve the working effect of drainage.

(4) The channel water body maintenance design

Irrigation and water conservancy design is not only a single consideration, but need to do all aspects, multi-level combination, through the overall investigation of the local environment, need to meet the design requirements of linear development, gradually found in the characteristics of soil erosion, effectively monitor the different factors of soil erosion, so as to further improve and improve the design scheme, prevent a lot of rain damage plant roots, improve the stability of slope soil. In the process of design, it is necessary to pay attention to soil erosion in the water fixation of farmland. Good water fixation work can avoid the lack of soil nutrients to the greatest extent, which is conducive to preventing land salinization [4]. Soil desertification also affects soil erosion. Therefore, when conducting the design, it is necessary to ensure the stability of the water body of the project and prevent the problem of land desertification to a certain extent, so as to reduce the impact on the soil. Within the farmland, the water supply must be gradually strengthened. The use of water pipeline can ensure safe water supply, but at the same time, the line needs to be controlled within a reasonable range, cost saving, convenient construction, and reduce the occupied farmland area.

At the same time, shelterbelts can be set up along the farmland according to the local climate environment. The tree species can be locust tree, and the spacing between each locust tree is 3 meters. The specific planting quantity is determined according to the actual range. So, in the process of land consolidation and irrigation and water conservancy design, planting suitable shelterbelt is necessary, can also combine the road near farmland, effective analysis of the scope of land and vegetation damage, thus can reasonably design of water conservancy facilities, choose the appropriate irrigation scheme, can use sprinkler irrigation or regular irrigation, gradually improve the soil and water conservation work [5]. In design, for example, on both sides of the cotton and wheat, can choose to plant jujube trees, so greatly reflects the effect of soil and water conservation work, also conducive to reasonable water conservancy facilities, so that the crops fully efficient water growth, avoid soil erosion, thus gradually improve the use of farmland, greatly reduce the large area of land desertification.

(5) Design of the pipeline water distribution system

Specifically, pipeline system design is another important part of irrigation water transmission project. It is an important explanation here that pipeline irrigation is irrigated according to the topographic environment, water quality and specific water consumption of the actual area. In general, according to the irrigation design, pipeline irrigation and the area, must ensure the normal pipeline irrigation, the pipeline strength, filling, tools, also need to pay attention to the traffic pressure, in the process of the pipeline design, the corresponding velocity and influence, effectively determine the scope of pipe diameter, so as to carry out reasonable pipeline system design [6]. In the overall design process, relevant staff need to establish contact between each other, according to the relevant problems, avoid problems in a link, cause serious impact on the project, farmland water conservancy design is more for field research, not only in indoor drawings and related analysis, actively communicate with local villagers, effective grasp the farmland and surrounding terrain and other

relevant environment, to effective design, constantly promote the practical application effect of pipeline irrigation, further reasonable land consolidation.

3 Measures for irrigation and water conservancy management

(1) Strengthen the attention to the management of irrigation and water conservancy

Country is for water conservancy projects, but in the process of engineering management, there are some local leaders, just the surface of the management, ignore the specific content, when drought and flood will cause absolute attention, in the lack of daily management and maintenance, lead to the lack of water conservancy management after the completion of the project. Therefore, the leaders of relevant departments need to pay some attention to it, constantly strengthen the management and maintenance of water conservancy projects, and realize that the management of water conservancy projects directly affects the local agricultural production activities and economic development, and need to carry out corresponding management in all aspects and pay attention to the maintenance of all aspects in the later period.

(2) Constantly strengthening education and training

Irrigation and water conservancy project construction and the villagers 'economic benefits have certain connection, for project management and maintenance, affect the villagers' production and life, this requires the government positive guidance, the attention of the leadership and the villagers 'active participation in various cooperation, improve the villagers' consciousness, realize the importance of water conservancy project construction, need to cause the attention of the villagers in different ways. Can through the network and other ways play the role of publicity and education, relevant departments can send professionals for the knowledge of the villagers, the villagers have deep understood and mastery of water conservancy knowledge, so that the villagers learn reasonable use related facilities, guide the villagers actively into the management of water conservancy projects, achieve full participation, the goal of common maintenance.

(3) Clarifying the management responsibilities

The rights and responsibilities of water conservancy project construction for a long time are not clear enough, so that the lack of management and maintenance of the project, which cannot effectively improve the management and protection effect. Therefore, after the completion of the project, must be clear management responsibility, specific implementation to the relevant officials and the relevant discussion and determine, for example, ownership, maintenance, and related system measures, etc., are need to specific analysis and research, one of the most important contents is to determine the content of the management, improve the management ability. For the property rights issues, the corresponding transfer can be carried out, and after the completion of the project, the overall property rights can be transferred to the local government or relevant organizations, so as to enhance the sense of responsibility, and finally facilitate the management and maintenance of the project, in order to avoid the situation of failure and unwilling to manage.

(4) Funds needed to be raised and maintained by various parties

For the management and protection of water conservancy projects, it is necessary to establish a corresponding fund-raising mechanism, and raise funds through various ways, which can be raised through the government, enterprises, social organizations and other aspects to ensure the effective source of funds, so as to effectively solve the fund problem of project management and protection. At the same time, it is necessary to reasonably allocate and arrange the funds raised, and formulate detailed and reasonable plans, so that there are enough funds in the later process of management and protection, and the funds must be reasonably arranged and used to prevent the shortage of funds in the later management and protection.

4 Conclusions

In short, in order to ensure the smooth development of land consolidation work, need to continuously study the irrigation and water conservancy design and management work, the work has certain complexity and comprehensive, need of reasonable planning, and according to the specific situation of different regions reasonable analysis, appropriate application of related engineering, make it play its due role, provide a good guarantee for the long-term development of agricultural economy in our country.

References

[1] Qiu Chunrong, Xu Wenbing.Thinking on the key points of small irrigation and water conservancy Design [J].Rural Economy and Technology, 2020,31 (20): 41-42.

[2] Gan Pengcheng.Research on Irrigation and water Conservancy Design Based on "Agriculture, Rural Areas and Farmers" [J].Water conservancy technical supervision, 2020 (03): 119-120 + 223.

[3] Cao Ying, Liu Tongbing.Irrigation and Water Conservancy Design and Management in land consolidation [J].Residential and Real Estate, 2020 (09): 169.

[4] Zhang Shiyuan, Li Chao.Analysis of irrigation and water Conservancy Design and Management in land consolidation [J].House, 2019 (35): 17 + 189.

[5] Zhong Yingying.Problems and matters involved in attention in the planning and design of irrigation and water conservancy projects [J].Residence, 2019 (15): 109.

[6] Yin Rui.Problems and practical paths of irrigation and water conservancy planning and design [J].Science and Technology Innovation, 2018 (20): 102-103.