A Study on the Importance of Water Conservancy Engineering Design

Chuankai Yang

1Xinyang City Water Conservancy Survey and Design Institute, Xinyang, 464000, China

Abstract. Water conservancy project as a part of Chinese socialism infrastructure projects water plays a major role in agriculture, industry and the domestic residents. Water conservancy engineering design is the most basic and important work in the early stage of water conservancy construction. We must do the design work of water conservancy project, and the problems in the design should be dealt with a timely manner so that the construction of water conservancy project can be carried out better. This paper gives an overview of the water conservancy project, explains its importance, analyzes the design of the water conservancy project, and puts forward the improvement measures for the problem.

1. Introduction

With the development of the society, the increasing of the population and the prosperity of the economy, the importance of the water conservancy project has become more and more prominent. Most of China is still in shortage of water currently. How to make water conservancy projects well to ensure people’s proper water use is the most difficult problems. The quality of the project requires that the construction is of the water conservancy is up to the standard and the demands and functions as well as the safety is refined. Therefore, the construction of water conservancy is profitable for the development of economy, society and the environment. It is quite necessary to have design in early stage of the construction of water conservancy which is also the promise about the smooth construction.

2. Introduction on water conservancy project

Water conservancy is the project which can control and allocate the surface water and ground water to eradicate harmful things and set up benefits for people. Water is a very important resource. Water is affluent for somewhere but some places are badly in shortage of water. Water conservancy is to improve the discordant situation. The construction of water conservancy is a way to guarantee the safety of life and properties, to meet the demands for water of people and to control floods and droughts. It is necessary and important to have the design of dams, dykes, spillways, water locks, canals, aqueducts, log chute and fishpass.

3. The importance of water conservancy engineering design

3.1. Optimization Influences Project Costs

Construction of engineering project includes three stages about project decision, project design and project implementation. The key on the investment controlling lies in the stages of decision and design. After the investment decision has been made, the key point is design. The project design, structural
style and construction materials have great influence on economical efficiency of project, especially the scheme comparison, material selection, structural design and foundation type.

3.2. The Quality of Design Products Influences Project Costs
The geological environment and conditions of construction is quite different for the site selection of water conservancy projects. The design have a direct impact on the project costs namely the economic principles. Sometimes the design changes so frequently that the designers are confused which makes the design is in disorder and the details are ignored. Some projects even have problems of quality and potential safe hazard which brings a lot of loss for the country and investors and causes a waste of investment.

3.3. The Influence On Operation Expense By Project Designs
The quality of project design can not only influence the disposable investment of project construction, but also it can influence the operation expense during the usage stage. For example, the expense of maintenance and inspection should be increased. If some water supply project does not analyze the annual water consumption for design and the scale is too large, the expense will be so high that the project will be in deficit state. The disposable investment of projects may have inverse relations with the operation expense. But the best combination of the two can be achieved through the increase of project quality to decrease the operation cost of the project construction to the most.

3.4. The Design Should Be Prospective
Unreasonable function setting has bad impacts on the later function. The backward equipment shortens the lifetime of project so as to increase the repair work, which influences the project costs. Overlapping investment influences the economic principles of the project. Therefore when designed the projects should be prospective.

4. The problems in water conservancy engineering design

4.1. Design Is Not Normative
Some of the project designer is lack of economic concepts. Inconsideration can influence the project design when they are designing. Problems in the project design can lead to the change of the construction plans during the construction which means that it is difficult to control the cost of project. Some fundamental materials are copied without basic arguments on the details of the design. All of this can have bad effects on the normal construction of the projects which can cause the price of project to be too high or too low so that the budget of construction is in distortion to affect the accuracy of the project investment.

4.2. The Design Is Poor
Current technology is too low and cannot meet the development demands in the water conservancy design and construction. A variety of environmental and ecological problems will appear after the project comes into use or in use for the lack of some related technological arguments and theoretical arguments like ecological protection and the lack of the scientific ideas of acting according to the circumstances and without the combination of construction environment and geographical conditions, aquatic environment together.

4.3. Water Conservancy Project Design Lacks Market Competition
Many water conservancy project designs are similar to some inferior commodities and they are not competitive in the market. This is because the water conservancy projects lack innovation in technology and equipment and construction funds as well as information management. The careful, responsible and innovative designers are desperately needed. With the development of economy, the competition has become fierce. The water conservancy firms have to focus on innovation to enhance the economic and environmental benefits to get the high level with low costs to adjust to the market economy competition to win in the market competition.
4.4. The Design Unit Lacks The Service Consciousness Of The Subject
The consciousness of service is quite weak which will lead to the arguments of the design with the proprietors. The designers will start without getting to know the exact requirements about the proprietors. The design faults will influence the clients’ satisfaction. The firms should take the system of proprietors to make them give the same emphasize on the costs and the income of investment. Problems in the design will have impacts directly on the costs of water conservancy projects.

5. Improvement measures

5.1. Improving The Expertise Of Designers
When we hire the water conservancy projects staff, the aptitudes have to be examined and the actual design level should be tested to ensure every staff is excellent in the expertise. The design institute should have training on the expertise and skill of the staff to provide the consciousness responsibility and quality management. The level should be ensured as the advanced so that the the project can be scientific and reliable.

5.2. Technology And Economy Should Be Prepared To Control The Project Costs
The deficit of water conservancy projects lies in the technology. It is necessary to innovate the technology to put it into the water conservancy projects. The design institutes should be interacted with to provide the reliable data for the designers. The discussion about the projects should be involved to have analyzes of technology and economy. Informatization and high efficiency can be realized in the operation of the projects with the advanced technology and scientific innovation so that the projects can contribute to people’s development.

5.3. Enhancing Competitive Strengths
Project design should be made according to the geographical environment of selected area, hydrographic features and the requirements of the proprietors. The whole qualities of the staff should be improved and the scrutiny systems of construction schemes should be refined to avoid changing the design at will. When the project is under construction, the staff should save resources with the domestic water resource situation.

   The considerations on land conservation, energy conservation, material conservation, water conservation can make the water conservation projects become the example of resources conservation. The water conservancy project should rely on the natural environment as much as possible but destroying the environment as little as possible and should get into the environment as much as possible. The project can be turned into water conservancy sightseeing zone to attract the social funds to promote the continuous development of water conservancy economy to realize the coordinated and sustainable development of engineering and environment.

5.4. The Design Concept Is People-oriented
The concept of people-oriented should be taken into considerations as the most of the water conservancy projects are built in remote mountainous areas and the situations are complicated as well as the design principles and project costs are not changed. The best situation is let engineering design become formalized. The true design is the most practical with great flexibility. To make the design into the practice, the designers should have the return visit to realize the concept of people-oriented of the overall projects.

6. Conclusion
Water conservancy projects are to eliminate water disaster and develop and utilize water resources and the foundation of the smooth running of water projects to ensure that the water conservancy can have more economic benefits. Although the experts of water conservancy have done quite a few studies, the design cannot be refined. It is a long task to improve the level of water conservancy project to foreign level. Any construction design can be disturbed by a lot of factors. Only the design is controlled, the resources can be controlled well to refine the whole project.
References

[1] Xiaobo Jing 2010 Research On Problems And Measures In Water Conservancy Engineering Design. *J. Shanxi Water Conservancy* 6 77

[2] Changjin Wang 2011 Discussion On Problems In Water Conservancy Engineering Design And Improvement. *J. Technology and Life* 2 13-14

[3] Guoya Fu 2012 Problems and Measures In Water Conservancy Engineering Design. *J. Jiangxi Building Materials* 5 121-122

[4] Liqiang Jin 2013 Problems In Water Conservancy Engineering Design And Improvement Measures. *J. Neimenggu Water Conservancy* 1 171-172