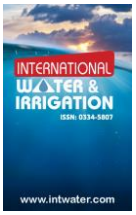

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Study on Environmentally Friendly New Mode of Land Requisition and Demolition in the Construction of Long Mileage Expressway

Shengcai Zhong, Hongwei Wang*
Guangxi New Development Transportation Group Co., Ltd, Nanning, Guangxi 530029, China
*Corresponding Author.

Abstract: Construction of long mileage expressway is an important part of China's transportation infrastructure construction. The efficient and high-quality completion of the task of land acquisition and demolition is of great significance to ensure the smooth opening of long mileage expressway. In view of the problems of large workload, many influencing factors, difficult coordination, environmental protection, and difficulty in maintaining agricultural and water resources stability in the construction and demolition in the construction of long mileage expressway, a environmentally friendly new model of long mileage expressway construction land acquisition and demolition based on full staff land acquisition and demolition was proposed by combining theoretical analysis with field research. In this paper, the characteristics and difficulties of long mileage Expressway and its land acquisition and demolition work were firstly analyzed, then the problems existing in the traditional land acquisition and demolition mode of long mileage expressway were analyzed, and finally a environmentally friendly new land acquisition and demolition mode of long mileage expressway construction based on full staff land acquisition and demolition was put forward. Nan Zhan expressway with 186.821 km long was taken as the background, the environmentally friendly new mode of long mileage expressway construction land acquisition and demolition proposed was adopted to carry out the land acquisition and demolition work. The results show that the review of more than 1000 mu land acquisition and demolition data in Pubei County was completed in only three days, and the completion rate of submission for review was as high as 100%, which has achieved good economic and social benefits, which can provide reference for the land acquisition and demolition of similar projects.

Keywords- expressway, long mileage, requisition and demolition, three party joint review, new model.

1. Introduction

In recent years, China's highway construction has made rapid progress. By the end of 2021, China's highway mileage has reached 117000 kilometers, which has effectively promoted the construction of a transportation power. The construction period is an important part of the whole life cycle of expressways. Influenced by policies, costs and other factors, the construction period is often a fixed period of time. The primary solution is the acquisition and demolition of construction land. Especially for long mileage expressways, there are many problems in the acquisition and demolition, such as heavy workload, many influencing factors, difficult coordination, environmental protection, and difficulty in maintaining agricultural and water resources stability in the construction and demolition. The minimization of the impact exerted by land acquisition and demolition activities on the environment, agricultural productivity, and water resource recycling, under constraints of limited human, material, and financial resources, as well as the attainment of environmentally conscious and efficient outcomes in such activities, holds great significance..

To this end, experts and scholars have carried out extensive research and achieved rich research results. Haitao Yang [1] et al pointed out that while emphasizing the construction progress, the legal compliance of land acquisition and demolition should not be sacrificed. The construction party should give full play to the role of overall planning and coordination, actively promote the work of land acquisition and demolition, constantly summarize the working methods and experience in the process, maintain good social relations and government relations, and ensure the smooth implementation of land acquisition and demolition. Yunbo Zhang [2] pointed out that relying on the local government was the key in the land acquisition and demolition work. Hua Wang [3] based

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on the analysis of the problems existing in the land acquisition and demolition of expressways, and pointed out the basic qualities that should be possessed by the legal and compliant demolition work, and puts forward some reasonable suggestions for the demolition work with examples. Zhenyu Chen [4] took the implementation of the land acquisition and demolition policy of Guangzhou Foshan Zhaoqing expressway (pithead section) as a specific example, the problems in the implementation of the land acquisition and demolition policy were analyzed, the reasons for the problems in the implementation of the land acquisition and demolition policy were explored, and then feasible suggestions and countermeasures according to the reasons were put forward. Ming Xiong and Zhen Wang [5] summarized their work experience in land acquisition, innovatively developed and improved the software of the highway land acquisition housekeeping system highway land acquisition and demolition management system, which helped solve the land acquisition problem. Ruodan Lv [6] et al analyzed the design and application of GIS+BIM, an information management platform for land acquisition and relocation of highway engineering projects. Lei Wang and Chaoqun Ge [7] summarized the experience of land acquisition and demolition work in the third section of keta expressway in Xinjiang, which has good reference significance. Xusheng Wang [8] Briefly analyzed the potential risks in each stage of land acquisition and demolition, proposed corresponding control measures, and put forward management measures. Haiyi Lan [9] analyzed the role of Ideological and political work in highway land acquisition and demolition work based on his work practice. Youming Wang [10] analyzed the countermeasures and suggestions in the fund management of land acquisition and demolition of expressways. Based on the relevant theories of public management and synergy theory, through the analysis of the case of land acquisition, demolition and resettlement of Cheng De Nan expressway project, Bifu Ren [11] summarized the situation of highway construction and land acquisition, demolition and resettlement, explored the current status of environmental impact analysis of land acquisition, demolition and resettlement during the feasibility study stage and preliminary design stage of highway construction, and explored the basic framework of environmental impact assessment in the process of land acquisition, demolition and resettlement and the specific evaluation process of the impact of highway land acquisition, demolition and resettlement.. Its ultimate goal was to form an effective operation mechanism for land acquisition and demolition work. Lupan Wang [12] discussed the current situation of the management of expressways' requisition and demolition funds, the existing problems were analyzed, and the countermeasures to solve these problems were discussed. Wende Shen [13] investigated and analyzed the general contract for land acquisition and demolition of yashiga Tongren expressway. The coordination of land acquisition and demolition of Yizhou Hechi expressway project in Guangxi was taken as an example, Huihua Wu and Fuchang Yao [14] analyzed the problems faced by land acquisition and demolition, and corresponding countermeasures were put forward. Lian Tang [15] analyzed the land acquisition and demolition of Expressway under the framework of property law. In view of the fact that the increase of land acquisition and demolition costs has become the main factor of over estimation, Wangshu Chen [16] put forward the cost control and management strategy of highway engineering land acquisition and demolition. Xiang Wang and Zhenqi He [17] combined with the management practice of the land acquisition and demolition funds of Ning Dao expressway, the management mode of settlement before payment and redistribution was proposed. These studies have good reference significance for solving the problem of long mileage expressway land acquisition and demolition, but the relevant research is not sufficient. Therefore, aiming at the problems of heavy workload, many influencing factors, difficult coordination, tight time and heavy tasks in the construction of long mileage expressway, in this paper, the characteristics and difficulties of long mileage expressway and its land acquisition and demolition work were firstly analyzed, then the problems existing in the traditional land acquisition and demolition mode of long mileage expressway were analyzed, and a environmentally friendly new land acquisition and demolition mode of long mileage expressway construction based on full staff land acquisition and demolition was finally put forward. Nan Zhan expressway with 186.821 km long was taken as an example, the environmentally friendly new mode of long mileage expressway construction land acquisition and demolition proposed in this paper was adopted to carry out the land acquisition and demolition work. The results show that the review of 1000 mu land acquisition and relocation data in Pubei County has been completed in only three days, and the completion rate of submission for review was as high as 100%, which helps to boost the land delivery

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completion rate of Pubei County by 25%.The total mileage development of expressway in China between 2000 to 2024 was shown in Figure 1.

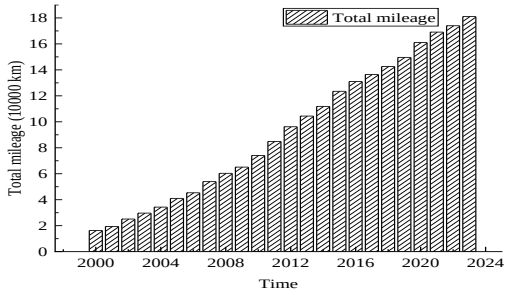

Figure 1. Total mileage development of expressway in China

2. Analysis of Land Requisition and Demolition Characteristics of Long Mileage Expressway

A significant feature of long mileage expressway was that it has a long mileage and crosses many administrative regions. Because the actual situation of each region is different, it is often difficult to have a general coordination mechanism, which is difficult to coordinate. Due to the large area that the expressway crosses, the area to be requisitioned and demolished is relatively wide, the workload is heavy, and the personnel investment is large. The topography of long mileage expressway is complex, and the amount of land used for various supplementary requisitions and "three reforms" is huge. The lack of design depth is also a major problem faced by highway construction at present, which directly leads to design defects and endless mid-term adjustments in the later stage, and the progress and cost of the project are affected. The folk customs are different, and the phenomenon of rush planting and construction is serious, which increases the investment and cost of the project. The mileage of long mileage expressway is matched with the large demand for funds and the difficulty of fund guarantee. The process of expressways' acquisition and demolition was shown in Figure 2.

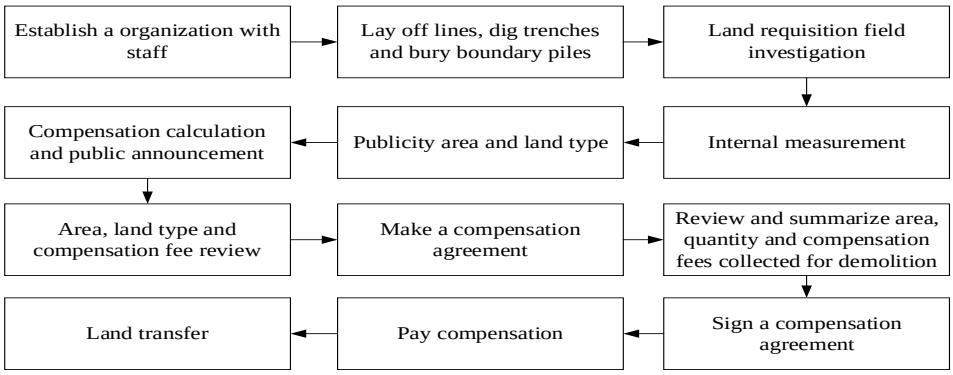

Figure 2. Acquisition and demolition process of expressway

3. Problems Existing in Traditional Long Mileage Expressway Requisition and Demolition Mode

The acquisition and demolition of long mileage expressway is a complex system engineering, which involves many factors, such as the attention and investment of the construction unit, the ability of planning and organizing implementation, the cooperation of local government and public support, the cooperation between construction and design units, the efficiency and effect of acquisition and demolition, and the skills and methods to deal with nail households. With the increase of highway mileage, the difficulty of related land acquisition and demolition is also increasing exponentially. The traditional land acquisition and demolition mode can not better adapt to the many challenges brought by the increase of highway mileage, and will expose many problems, which will directly or indirectly affect the effect of land acquisition and demolition of long mileage highways, mainly in the following

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aspects. When the expressways are expropriated and demolished by entrusting the local government, main relationship diagram of land acquisition and demolition entrusted to the local government is shown in Figure 3.

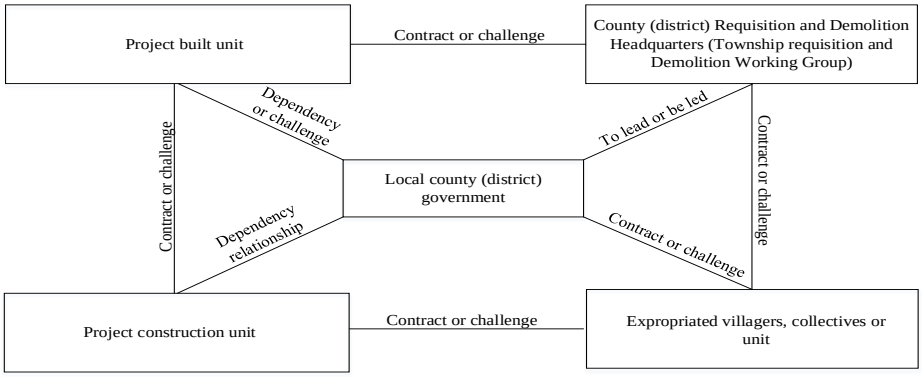

Figure 3. Main relationship diagram of land acquisition and demolition

(1) The traditional long mileage expressway land acquisition and demolition often lacks a strong unified organization and command system, which leads to uneven progress of land acquisition and demolition work, and the problems in the process of land acquisition and demolition can not be solved timely and effectively, thus the overall construction progress of the project is affected. In addition, the development of land acquisition and demolition work is often out of line with the cooperation of local governments, which leads to the local governments' inability to effectively provide support for project land acquisition and demolition, which virtually increases the difficulty and resistance of project land acquisition and demolition.

(2) The inconsistent direction, uneven force and unbalanced development between the project construction unit and the participating units are also important reasons for the slow progress of the land acquisition and demolition work. The expressway construction project involves the construction unit, the construction unit and the supervision unit, etc., and its successful completion and opening to traffic requires the joint efforts and cooperation of many parties. The goal of the project construction unit is to ensure the safety, quality and progress of the project, while the construction unit focuses more on the progress of the project. In addition, each participating unit has different understanding and attention to the land acquisition and demolition work, resulting in the slow progress of the land acquisition and demolition work.

(3) Missing the opportunity of project acquisition and demolition or leaking secrets will cause a large area of rush planting and construction, which will not only cause great resistance to the acquisition and demolition of the project, affect the progress of acquisition and demolition, but also increase the cost of acquisition and demolition, resulting in a large risk of over estimation. At the same time, the failure to effectively solve the compensation and resettlement of land lost farmers and the social security problem of land lost farmers is also a problem faced by the traditional mode of land acquisition and demolition, which is one of the main causes of the mass incidents of land acquisition and demolition.

(4) The management of land acquisition and demolition is relatively simple, the degree of informatization is not high, and it can not adapt to the characteristics of land acquisition and demolition, such as more links, large amount of data, and high data accuracy requirements. It is easy to bring some inevitable errors in the identification of demolition and compensation, and the workload of data accounting is doubled, which further leads to a significant increase in the difficulty of land acquisition and demolition management.

4. New Countermeasures for Requisition and Demolition of Long Mileage Expressway Construction

In view of the problems existing in the traditional mode of land acquisition and demolition in the process of land acquisition and demolition of long mileage expressways, combined with the characteristics of long mileage expressways, the following new countermeasures for land acquisition and demolition are put forward.

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(1) Improve organizational structure and establish contract orientation. Achieve pressure transmission and win-win goals with the government. Connect the expropriation and demolition work with the performance of the government and the promotion and adjustment of civil servants to form a public body of destiny. The headquarters should adjust measures to the time, take the opportunity of the supervision team of the Department of communications and the change of the local government, strengthen the communication and coordination with the relevant leaders at the municipal (District) and county levels, reduce the responsibility to the township leaders, and improve the responsibility and enthusiasm of the township leaders. At the same time, corresponding reward and compensation mechanism, emergency response mechanism and supervision mechanism shall be established.

(2) All staff shall be employed for requisition and demolition. Straighten out the relationship and composition of multiple interests in the process of land acquisition and demolition, clarify the responsibilities of various multiple interests, and form an effective operation mechanism for land acquisition and demolition. The construction unit, governments at all levels, design units, construction units, etc. need to be included in the implementation of the land acquisition and demolition work. The headquarters set up a project land acquisition and demolition work team to implement the "all staff land acquisition and demolition" working mechanism, advocate that all departments sink in the front line of project land acquisition and demolition, adhere to the goal orientation, problem orientation, grass-roots orientation, and cooperate with local governments, land acquisition and demolition headquarters, construction units and other departments to form a joint force, all staff work hard to overcome difficulties, try their best to solve the problems of land acquisition and demolition, and effectively promote the project land acquisition and demolition work.

(3) Adopt the big regiment tactics. The regiment tactics include but are not limited to joint office, tripartite joint review, all-weather and centralized fight against annihilation, etc., reducing the space distance and time cost of communication and coordination. The headquarters leapt out of the traditional process of layer by layer review of land acquisition data, and concentrated the local land acquisition and demolition headquarters, the headquarters' coordination department and the finance department in a "tripartite joint review", solving the problems encountered on the spot, greatly reducing the data transmission and feedback time between departments.The workflow of three party joint review was shown in Figure 4.

(4) With law and clean government as the main line, we should integrate reason with reason, use the police force cautiously, and build a harmonious environment for expropriation and demolition. A harmonious environment for land requisition and demolition is conducive to the smooth promotion of land requisition and demolition work. Law and clean government should be the main line and bottom line for carrying out land requisition and demolition work. On this basis, the actual situation of various places involved in land requisition and demolition should be fully considered, so as to be in accordance with laws and regulations, reasonable and reasonable. Although protective construction is an option for carrying out the land acquisition and demolition of large-scale projects, it also means that the contradictions in the land acquisition and demolition work have been intensified to the point that it is difficult to reconcile, and the deployment of the police force may even further intensify the contradictions, bringing greater resistance and difficulties to the land acquisition and demolition work, so it is necessary to use the police force carefully.

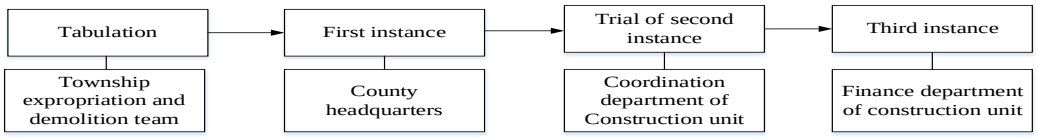

Figure 4. Workflow of three party joint review

(5) Technology empowers, reduces errors and improves efficiency. Make full use of modern information means[18], such as GIS (Geographic Information System) geographic information, mobile Internet and other information technologies, give full play to the advantages of online approval, remotely process the circulation and approval of contracts, realize the electronic information management of land acquisition and demolition work,

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reduce the errors caused by manual data entry and processing, greatly improve the work efficiency of the land acquisition and demolition staff and the accuracy and integrity of the data, and effectively avoid the risk of repeated payment of land plots and land attachments.The good helper for land acquisition app section was shown in Figure 5.

Figure 5. Good helper for land acquisition app section

(6) Fund guarantee, on-site office, and elimination of obstacles. Sufficient funds are the basis for carrying out the project requisition and dismantlement work. The construction unit actively raises funds for the project requisition and dismantlement through multiple channels under the premise of laws and regulations, and arranges special personnel to supervise the use and distribution of the project requisition and dismantlement funds. In order to reduce the deviation between the data presentation and the actual situation, and save the progress of data application and review, all the staff of land acquisition and demolition can use on-site office as much as possible, go deep into the front line of land acquisition and demolition, and try their best to eliminate the influencing factors in the work of land acquisition and demolition.

5. Case study

5.1 Project Overview

Nanning Zhanjiang expressway is an important branch of Guangxi expressway network planning. The project route starts from Liuchong hub interchange of Nanning Ring Expressway, passing through Yongning District of Nanning City, Lingshan County and Pubei County of Qinzhou City, Bobai County of Yulin City, and finally at the junction of NaBu Town, Guangxi and Guangdong. The contract duration of the project is three years. The total length of the project route is 186.821 km. The technical standard of two-way four lane expressway is adopted. The design speed is 120km/h. The estimated investment of the whole line is about 22.651 billion yuan, and the construction and installation cost is 16.710 billion yuan. Nanning Zhanjiang Expressway passes through Yongning District of Nanning City, Lingshan County and Pubei County of Qinzhou City, and 19 towns and townships in Bobai County of Yulin city. The total design land acquisition area is about 20892 mu. The land acquisition area is wide, the population involved is large, the contradiction between people and land is serious, and the land disputes are complex, so it is difficult to acquire and dismantle the project.

5.2 Characteristics of Requisition and Demolition

The main line of Nanning Zhanjiang expressway is 186.82 kilometers long, with an estimated investment of 22.65 billion yuan. The project is constructed in a non District City co construction mode. The owner bears all the land acquisition and relocation costs and entrusts the local government to carry out the land acquisition and relocation work. The main line of Pubei section of the project is 34.21 kilometers long (about 4000 mu), passing through five towns and villages. There are many data related to land acquisition and demolition. In addition, Pubei County does not have the assistance of land acquisition and demolition software, and all data review work is completed manually. The lack of intelligent data matching land acquisition and demolition data (specifications and

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compensation standards cannot be correlated and matched) adds greater difficulty and pressure to the data review team.The quantity of land acquisition for the project was shown in Table 1.

Table 1. Quantity of land acquisition for the project

	Yongning section	Lingshan section	Pubei section	Bobai section
Mileage (km)	34.1	74.6	34.2	43.5
Total investment (10000 yuan)	411832	905621	414664	532959
Planned land acquisition (MU)	4017.8	7886.9	4034.5	5539

5.3 Requisition and Demolition Effect

Since the official launch of the requisition and relocation work of Pubei County, as of March 16, 2021, the data review progress of Pubei County is only 286 mu, and the land delivery rate is only 17%, ranking the last in three counties and one district of the whole project. In order to speed up the review and payment of land requisition and relocation data, and try to reverse the backward situation of land use on the red line of the main line transferred by Pubei County, under the unified deployment and coordination of the headquarters' leadership, the finance department and the Coordination Department of the headquarters took the initiative and dared to take on the responsibility. In conjunction with the land requisition and relocation work headquarters of Pubei County, the "three party joint review" working mechanism was adopted, that is, the three departments worked together in a centralized manner, unified thinking, clear division of labor, and solved the problems encountered on the spot, greatly reducing the time for data transmission and feedback between departments, and reducing the time for checking payment. According to the traditional working mechanism of "separate office and layer by layer review", the original phase I data needed at least 3 days from initiation to payment, while the "three party joint review" only needed a few days.Hours to complete. The working site of tripartite joint review is shown in Figure 6.

Figure 6. Three party joint review work site

In addition, in terms of the data review method, the finance department and the coordination department combined with the actual situation and put forward the working idea that the land data should be reviewed at the same time, and the coordination department of seedlings and above ground attachments should review first, which not only greatly improved the data review speed, but also improved the accuracy of the data, and maximally guaranteed the safety of the acquisition and relocation funds and the interests of the project owner. From March 18 to 20, the finance department and coordination department of the headquarters of Nanning Zhanjiang Expressway and the land acquisition and demolition headquarters of Pubei County jointly adopted the working mechanism of "tripartite joint review". The three parties worked together in the land acquisition and demolition headquarters of Pubei County, and completed the review of more than 1000 mu of land acquisition and relocation materials in Pubei County in only three days. The completion rate of submission for approval was as high as 100%, the completion rate of land delivery in Pubei County is boosted by 25%.

Through the comprehensive application and persistence of the above methods, the land delivery of the whole line of Nanning Zhanjiang expressway was 80% within three months from the start of the land requisition and demolition work, Less than one year after construction, the whole line has completed 100% land delivery, 99%

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cash payment, 100% tomb relocation, and 100% house demolition, and the project has been closed. In the first eleven months of 2022, the project completed an annual investment of 8.598 billion yuan, accounting for 113.14% of the annual investment task of 7.7 billion yuan issued by the department of transport of the autonomous region; The accumulative investment completed during the construction is 14.366 billion yuan, accounting for 63.4% of the total estimated investment of 22.65 billion yuan; There are no quality and safety accidents; The implementation of a scientific, rapid and effective new mode of land acquisition and demolition has led to fruitful results and remarkable results in the construction of Nanning Zhanjiang expressway.

6. Conclusions

The construction of long mileage expressway is an important part of China's transportation infrastructure construction. The efficient and high-quality completion of the task of land acquisition and demolition is of great significance to ensure the smooth opening of long mileage expressway. In view of the problems of large workload, many influencing factors, difficult coordination, environmental protection, and difficulty in maintaining agricultural and water resources stability in the construction and demolition in the construction of long mileage expressway, a new environmentally friendly land acquisition and demolition model for the construction of long-distance highways, based on full staff involvement in land acquisition and demolition, is proposed in this article through a combination of theoretical analysis and field research, with an emphasis on minimizing the impact of these activities on the environment, agricultural production, and water resource recycling.. Firstly the characteristics and difficulties of long mileage Expressway and its land acquisition and demolition work were analyzed, then the problems existing in the traditional land acquisition and demolition mode of long mileage expressway were analyzed, and finally a new land acquisition and demolition mode of long mileage Expressway Construction Based on full staff land acquisition and demolition was put forward. Taking the 186.821 km long Nan Zhan expressway as the background, the environmentally friendly new mode of long mileage expressway construction land acquisition and demolition proposed in this paper is adopted to carry out the land acquisition and demolition work. The results show that the review of more than 1000 mu land acquisition and relocation data in Pubei County has been completed in only three days, and the completion rate of submission for review is as high as 100%, which has achieved good economic and social benefits, which can provide reference for the land acquisition and demolition of similar projects.

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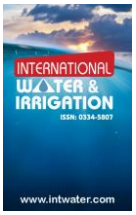

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