



A Study on Ethical Issues in the South-North Water Diversion Project

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Abstract: With the modernization process in China, the south-north water diversion project has become the inter-basin water transfer project, whose purpose is to solve the northern water crisis and achieve balanced economic development. The project will cost a large amount of investment and last for long, involving an extensive geographic region and various fields. From the perspective of engineering ethics, this article aims to ponder upon the main ethical problems involved in this the construction of this project: ecological problems, resettlement issues, and security issues, with a further analysis of the causes to these problems: the drive of interests, the lack of engineers' ethics education, the lack of enterprise ethics education, the lack of ethical rules among engineering community, imperfect legislation of resettlement. Moreover, the article also puts forward some solutions to the problem: perfecting legal system in the engineering field; setting up engineering ethics committee; carrying out engineering ethics education, improving the ethical awareness of engineers; setting up the ethical codes for south-north water diversion project.

Keywords: south-north water diversion project, engineering ethics, engineers, ethical codes

1 Introduction

Water conservancy engineering ethics refers to that in the process of protection and control of water, the water conservancy engineers should be responsible for the public, the environment, the society, by making a balance between interests and responsibility, local benefits and national benefits, economic benefits and environmental benefits, current demands and long-term needs, and should abide by the codes of conduct and ethics.^[1]In virtue of this, the project may give rise to profound influences. In the construction of the south-to-north water transfer project, it should not only follow the basic principles of project construction, but also take other relevant factors into full consideration, such as technical factors, economic factors, knowledge factors and especially, the ethical factors, which plays a dominant role in establishing the correct values and behaviors of the engineering personnel's, making engineering ethics cherished in every step of construction, such as planning, design, construction, supervision and so on.

Great research achievements of engineering ethics have been made by scholars. There is a consensus about the definition of engineering ethics, which denotes that the engineering group has to regard public health, environment protection and sustainable development as a core value, making a rational choice in the face of a variety of engineering ethics conflicts, using practical wisdom to deal with all kinds of complicated engineering problems; adjusting the ethics' code of the relationship between engineering, technology and society; abiding by the principles of ethics in the field of engineering.^[2] The educational scholars generally divide engineering ethics into narrow sense of engineering ethics and general sense of engineering ethics, or into two categories of macro and micro engineering ethics.^[3] John West, a famous ethicist, further categorized engineering ethics into "micro-ethics" or "macro-ethics". The "micro-ethics" emphasizes the relationship between the engineers and customers, as well as that between employees and employers. The "macro-ethics" refers to the responsibility of the engineering professionals for a collective society. In other words, the "micro" considers internal relationship between personnel's and engineering professionals, while the "macro" applies to social responsibility and social decision about technology. Secondly, in the aspect of engineering ethics education, it emphasizes the ethical education of engineering students in colleges and universities. Thirdly, in terms of research methods, He Jing and Dong Qun, pointed out that engineering ethics, as a kind of professional ethics and practical ethics, have the research methods through specification to achieve "a limited ethical objective", and then they put forward the research methods, which differed from the traditional engineering ethics--scene narrative, providing a new perspective for the study of the current engineering ethics.^[4] Fourthly, the study focus has changed. The United States, the Netherlands, Australia and other western developed countries have gradually changed their focus on engineering ethics from the microscopic ethics to the macroscopic ethics. The macro-transition of engineering ethics in the west, from the point of view of engineers, is produced to clarify the engineer's ethical responsibility with the expansion the public responsibility.

This paper mainly studies the following ethical problems: ecology, resettlement and security, which are

caused during the process of south-north water diversion project construction. The majors are as follows: firstly, safety problems involve the issue of moral responsibility. In the process of engineering construction, decision-making, design and execution of project and the compliance of engineers' behaviors with the standard of social ethics will determine whether the project can proceed smoothly. Secondly, the resettlement problem is not only the important precondition to the smooth running of the project, but also closely related to whether the migrants will enjoy prosperous lives. It also lays a solid foundation for the stability and harmony of the society. Finally, the ecological problem will exert a profound effect on contemporary people's living environment and on the future generations. In the process of project construction, it is gradually realized that the harmony between human and water is the foundation for scientific development and society progress. It is also integral to the realization of sustainable development. In the construction of a harmonious society, it is urgent for the project to transform its purpose, from transforming the nature purely for the sake of human interests to serve the sustainable development, and finally shoulder the important task of shaping a sustainable future.^[5] At the same time, this paper makes a further analysis of these ethical problems and puts forward some suggestions.

2 The main ethical issues arising in engineering construction process

2.1 Ecological problems

The ethics, centered on the ecology, is put forward by Leopold. He argues that people have the duty to promote the balance of ecosystem, "when a thing tend to protect the integrity, stability, and beauty of the ecological community, it is justified; when it is the tendency of the opposite, it is wrong."^[6] The ecological ethics of water resources and hydropower engineering construction insists that the damage to the ecosystem should be reduced as much as possible, with a focus on ecosystem restoration and reconstruction, such as conservation of endangered species, restoring vegetation to prevent soil erosion in the land of afforestation, setting up rare fish migration channel, and so on.^[7] But, because of the large span of south-to-north water diversion project, any decision is bound to be affected by some forms of utilitarianism. As a result various stakeholders only focus on engineering quality and engineering benefits, reducing the constraining power of ethical codes, and finally the region' s environmental damage is unavoidable. First of all, the project has an effected on the system of physical chemistry such as climate, hydrology, soil and geological. The project of south-to-north water diversion project has change the space of water, the content of water in the air, surface water and groundwater levels, resulting in the change of the temperature, climate. The flow of sand and soil composition in the process of the project construction

would cause the transformation of soil type, leading to earth's swamping, salinization. Secondly, the project has an impact on the biological system in the water. Due to the flow of water can make the biological and the surrounding water ecological environment changes, resulting in biological change in the natural environment and biological variety. Finally, the project has an impact on human production activities. The south-north water diversion project involves five provinces and cities, where human's production and life vary a lot, especially in terms of the development of agriculture, animal husbandry. The project directly changes their direction of development. Meanwhile, because of industrial waste water, agricultural irrigation water may once again be discharged into the south-to-north water transmission channel and indirectly affect water quality and ecological environment.

2.2 Resettlement problems

Engineering decisions not only should take the initiative to consider social recognized ethical code, and make decision-making, decision-making process, development target, management authority in accordance with generally accepted ethical requirements, but also should consider the special ethical demands of engineering project. To achieve such ethical goal, it requires engineering decision to correctly handle the relationship between the subject and object of decision, to improve the sense of responsibility of decision-making body, and to pay attention to the effectiveness and efficiency of decision-making, in order to maintain the safety of life and property, to promote social stability, to safeguard the principle of justice, to protect the ecological environment, and to realize the sustainable development.^[8] The south-to-north water division project, would permanently covers an area of 1.02 million mu (765 square kilometers) and needs to resettle a population of about 380000. Therefore, in the process of project construction, many problems related to the resettlement has arisen. First of all, immigration rights system is not sound enough. Because the immigrants are in lack of the right of speech and knowledge for the relocation and resettlement program, and in lack of effective complaint channels when they are encountered with unreasonable resettlement compensation, the legal rights and interests of migrant are not guaranteed. Secondly, the government only focuses on economic compensation, but doesn't give full consideration of all kinds of new social, cultural, environmental problems the immigrants will face. Migrating to a new region, immigrants would restore and rebuild the community organization, political, economic and cultural systems. However, the government has not paid enough attention to these aspects, resulting in a lot of questions, and causing inconvenience to immigrant life. For example, according to tracking report, in He Nan province, south-north water diversion project resettlement housing quality problems are mounting: concrete falls off, roof leaks, and wall cracks. A series of quality problems took

place in Li Ying village, Guo Dian town, Xin Zheng city, He Nan province, which made immigrants very sad.^[9] Finally, the measures, such as management, service, and compensation which are related to immigration, lack consistency. In the relocation period, the government has offered many preferential compensation policies and given supporting policies in production and living, in order to finish the relocation work smoothly and to ensure the project on schedule; however, the reality is that these policies can be implemented only in the short term. As time management and service consciousness gradually fade out, and relevant compensation policy is cancelled, to a certain extent, the government can't effectively ensure the social integration of immigrants to live and work in peace and contentment; for example, some of the elderly and children, unable to join the labor market, will face serious difficulties, after the compensation policy is cancelled.

2.3 Security issues

Fully considering the safety performance of the product and labor protection measures with a strong sense of responsible, engineers must take account of the safe reliability and harmlessness to humans.^[10] South-to-north water transfer project engineering is not only a gigantic project with long front, across the canal bridges, but also covers more complicated regional geological structure. Therefore, in the process of planning and construction, there are many inevitable problems. First of all, the object of construction is complex and likely to cause security issues. Due to the long coverage of south-to-north water diversion project, not only the geological structure and climate are complex, but also the construction objects vary a lot. For example, in some areas, the geological conditions entail the exposure to explosive detonator, which would lead to blasting safety issues. Some areas involved seasonal construction between flood seasons, which is vulnerable to flooding; secondly, the construction technology is difficult and prone to cause hidden security issues. Because the south-north water diversion project covers five provinces and cities: Jiang Su, An Hui, Shan Dong, He Bei and Tian Jin, the process of construction would face complex and unfavorable geological and climatic conditions, which would bring about huge technical and safety challenges. The extremely difficult projects, such as reinforced concrete lining of tunnel hole in the body, especially the concrete lining of block section, as well as high altitude, dangling mass concrete form work, concrete pouring and steel construction will lead to serious security risks in the process of construction.^[11] Finally, workers' quality and performance are uneven, so it is not easy to control the safety accident. On the one hand, because the south-to-north water transfer project undertakes the public bidding project, it is inevitable to involve many construction organizations; on the other hand, due to the fact that participants in the construction are migrant workers, it is inevitable to result in the low quality of workers. Moreover, the safety awareness of

workers is relatively weak, finally increasing the risk of human safety accident in construction process. For example, workers, lacking the awareness of self-protection, always fall from the scaffolding during the process of high-altitude operations.

3 Analyzing the causes of ethical dilemmas in the process of the South to North Water Diversion Project

3.1 The drive of interests

At different stages of the decision-making and implementation of south to north water diversion project, the maximization of the profits has become the goal which each of the participants is pursuing. When the participants of project putting the interests in the first place, it can withstand the temptation of self-interest, making the right professional judgment, and avoiding making the choice against the ethics in the case of a conflict of interest; and when the participants of project take self-interests as their goals, it is likely to cause ethical risks in the process of south-north water diversion project practice. Nowadays, under the condition of universal weakening of people's moral concept, the whole social moral landslide, the participants of project not understanding their own ethical responsibility comprehensively."^[12]The south to north water diversion project is led by government and other relevant authorities organizations are responsible for decision-making, investment, and construction. Although the government and other related departments are not directly involved in the construction of the project, it bears the management of the verification of the construction units' qualification and the final acceptance of engineering quality. Under this management system, the government and other relevant authority officials have a lot of rights. At the same time, they are also faced with the temptation of huge profits. Facing the improper interests conflict with the legal enforcement of the authority in their hands, currently, many officials are likely to ignore the ethical and legal constraints and to make a great amount of money-power deals. Many officials may be lean on their authorities to offer and accept bribes, delivering the project to the company which do not conform to the construction qualification, skimping on engineering cost, pro forma construction supervision and quality inspection. It has led to the massive emergence of the corruption projects, jerry-built projects and vanity projects. For example, "in a city, a bridge was deemed as dangerous bridge as soon as it was built. It has been blocked by a blockade during the process of the south to north water diversion project construction."

3.2 Engineers lack ethics education

Trevino, L.K. and McCabe, D. believe that good quality and cannot guarantee that people can identify conflicts of interest, making priority ordering of the

demands among multiple stakeholders conflict, or responding to different cultural customs.[13]The engineers, as the design, implementation, supervision and quality acceptance of the south-north water diversion project, assume direct responsibility for the engineering quality. Due to wide covering of engineering, involving many construction units, the engineer's responsibility, consciousness and ethical quality are uneven and will inevitably lead to engineering quality problems. For instance, in the Xing Yang section of the middle route of south-to-north water transfer project in Zheng Zhou city of He Nan province, there is a large number of cracks in just one or two months after a concrete revetment. It could be attributed to concrete fracture, which should be blamed on the low engineering quality. The reasons may be listed as follows: firstly, ethical education to cultivate professional engineer is congenitally deficient. The courses, related to the science and engineering students' ethical education in university or colleges, have been marginalized or absent for long, and have not become the core curriculum for engineering students, as a result of which the engineering students acquire a solid theoretical knowledge, but lack the strong consciousness of responsibility and ethical quality. Consequently, it is difficult for the students to deal with the engineering ethical issues effectively. Secondly, the engineers lack the professional skills and ethics training before starting their career. On the one hand, new engineers, without the necessary professional skills training, do not have the corresponding professional qualification and enough ability, which cannot meet the requirements of professional admittance system; on the other hand, because new engineers could not receive the moral rational training which is the core of responsibility ethics, they also cannot meet the demands of a qualified engineer with high ethical quality.

3.3 Enterprises lack ethics education

In his famous work "the Protestant Ethic and the spirit of capitalism", Max Webb, the famous German sociologist and economist, pointed out that the capitalist civilization is not only a product of rapid economic development, but also is the crystallization of the progress of social morality. Ethical spirit is the great power to promote social and economic development.[14]The enterprise ethics, as enterprise's organization ethnics, has functions of guiding, constraining, cohering and encouraging members of the enterprise. Good business ethics, therefore, is not only one of the necessary conditions to create a good corporate culture, but also to enhance the influence of enterprise culture. Moreover, it is also one of the key factors to promote the sustainable development of enterprises. However, some people may think, under the condition of market economy, the maximization of profits is the primary aim of economic body, thus the existence of the enterprise should be for the purpose of profit.[15] On the one hand, affected by the idea of economic profits and depreciating morality, some ethical

problems appear in the process of project construction: firstly, the enterprise pay more attention to the workers' skills, while the ethical education of workers is relatively overlooked, causing the regulators not to solve safe hidden trouble instantly, and finally increasing the risks of safety accidents in the process of construction; secondly, reward or punishments to managers or construction personnel are uncertain. Because some anti-ethical behaviors can gain greater profits than paying costs, such as jerry, these beliefs can lead to some supervisors to give up ethics, which eventually results in the security and management issues.

3.4 Engineering community organization and system are not sound in China

The development of Chinese engineering community has begun to take shape, and has formed five engineering communities: the Chinese Mechanical Engineering Society, China Civil Engineering Society, China Chemical Industry Association, China Computer Society as well as the China Engineering Consulting Association and so on. However, so far, none of the community has created their own ethical rules, and nor have they achieve compliance with the system, policy, law and management. Therefore, the process of engineering can only be constraint by the inner beliefs of engineering community members and social public, which is not powerful enough. The construction process of engineering is an engineering community made up of all walks of life as a kind of teams engineering activities. However, because there is no necessary ethical rules to make the necessary soft constraints, many problems will inevitably arise during the process of engineering construction. Firstly, since there is no sound ethics committee (including: scientists, legal experts, sociologists, economists, ethicists, government officials, policy makers, engineers, engineering supervision, and the general public), it cannot form a unified ethics rule in the process of engineering construction. Secondly, since there is no ethical rule, it is unlikely to form an effective constraint mechanism for community member. The decisions of south-to-north water transfer project are mostly in the hand of the government, enterprises, while, the engineers, as employees, only have the executive rights. Even when some techniques might do harm to social development and environment, they can't take effective measures to prevent the application of technology. As an American scholar Roman Buddha said, "the engineer just was a tool or means to reach the company purpose. Enterprise superior determine the work target of engineers, while engineers need not to evaluate and criticize these goals on the ethics, his duty is to use his own knowledge, skills and experience to successfully accomplish tasks, and need not to consider their knowledge and skills to be used for what purpose. As long as the project is legitimate, whether moral or not, the engineer shall implement".[16] Therefore, should some technologies be implemented? Will some stages of the engineering practice cause damage to the ecological

environment? Will the implementation of the whole project affect the fairness between generation and inter-generation? So, due to the lack of the effective guidance of ethical rules and of consultation between the members of the committee, decisions of engineering ultimately lead to the moral degeneration in engineering practice.

3.5 Imperfect legislation of resettlement

After decades' exploration and practice, China's legal system construction has obtained certain result, but immigration policies and regulations have not form a complete system of laws and regulations. Firstly, it lacks a unified and standardized immigration law. So far, there is no special immigration law in our country, and there are only some immigration policies, regulations, instead; since immigration laws and regulations have the inherent oneness and stability, it is difficult to standardize the current immigration work; meanwhile, because the diversification of stakeholders relating to immigration has made the laws and regulations be over interpretation, the rent-seeking phenomenon appeared. Many immigration policies and regulations have taken on the phenomenon of mutual conflict and overlap. The fragmentation of the governance state seriously affected the work of immigrants and it is urgent for government to legislate a special immigration law to specifications. Secondly, immigration laws in China are lagging behind. On the one hand, from a macro point of view, the idea of immigration guidance is outdated. China is currently in the transformation period from the planned economy to market economy. As a result, the basic guiding ideology involuntary immigration policy still has the characteristics of the era of planned economy, so the guiding ideology of the legal norms cannot keep pace with the times. On the other hand, the lack of immigration policies and regulations is due to the cyclical demand of policy-making process and strict approval procedures, which will inevitably lead to the time difference between the introduction of immigration policies and the beginning of the resettlement work. Last but not least, Some of the major laws and regulations policy may only apply to a certain period of time, and some do not adapt to the practices of immigration work and the requirement of market economy system, which has led to legal authority fuzzy, the provisions of stakeholders' rights and obligations ambiguous, and finally influenced the smooth advance of resettlement work.

4 Ways to solve the ethical problems of South to North Water Diversion Project

4.1 Strengthening the legislation and management of engineering practice

As is known to all, morality is a kind of "soft constraints", and its results are indirect, long; But, the laws, on the compulsory means to "stop", is a kind of

"hard constraints", and its results are direct and instant.^[17] Therefore, it is necessary for the engineering practice to set double legislations. One is the foundation of administrative laws to legalize the ethical problems. On the one hand, under the background of the law, the articles of association, which the project participants should comply with, should be raised as legal norm. It could be more effective to rely on the law to supervise and guide the project participants' behavior. At the same time, there can also be a penalty against unethical behavior. On the other hand, engineering laws and regulations should be perfected in our country. In 2011 China issued "Guidance On the Implementation of 2011 Central No. 1 File and the Central Water Conservancy Work Conference Spirit to Strengthen Water Conservancy Construction and Management", which required that the ownership of small water conservancy project of public interest should not be auctioned, and the quality of water conservancy project would require lifelong responsibility. With the constant improvement of laws and regulations, the social environment of the south-north water diversion project construction will also be continuously improved, so as to realize the fairness and justice of the engineering responsibility. Secondly, the ruling of ethics will raise people self-awareness and self-discipline through the unique tool of human beings. In real life, the execution of the law depends on the stimulation of moral drive. The effective implementation of the law, not only lies in the complete comprehensive legal system itself, but also in consciousness and moral rationality which is produced by the moral self-discipline.

4.2 The establishment of engineering ethics committee

As the south-north water transfer project is an unprecedented great inter-basin water transfer project, it will inevitably face all kinds of dilemma of moral selection in the process of engineering construction. What's worse, there is no experience to follow to solve these problems. Therefore, the most effective way is to carry out the collective consultation and discussion, to gradually unify the understanding, and to guide and solve the ethical dilemma in engineering construction. As a result, the establishment of engineering ethics committee will be of great significance. Although engineering ethics committee is not policy decision-making departments, but also can affect the decision-making departments. Although it is not authority, it can be an authoritative institution. First of all, members of ethics committee should include engineering professionals and laypeople, namely, law, philosophy, ethics and other professionals. Ethics committee members, with different professional background, can undertake ethical review from various perspectives. There can also be ethics guidance to engineering activities, demonstration, constraints and supervision. Secondly, the ethics committee has a significant contribution to raise the quality of engineering. Ethics committee of the south-north water diversion project would discuss whether there are some

internal ethical issues in the decision-making, design, construction and other aspects, or whether the project would affect the natural environment and the interests of the masses and our offspring. To a certain extent, it would alleviate the contradiction and conflict between project and ethics. Finally, the ethics committee would play an important role in improving project participants to pay more attention to ethics and to enhance their ethical consciousness. The important functions of ethics committee include consultation and the education. Counseling aims to help the workers, who have moral confusion, to solve their problem and to provide advice concerning right choice. Education, through the files, network platform and case studies, could teach the workers ethical knowledge. And through public discussion, listening to the opinions of the project participants, it would be easier for ethnic committees to carry out the work. In short, the establishment of engineering ethics committee has a significant meaning in raising workers' ethical consciousness and in improving the quality of engineering.

4.3 Building engineering ethics rules

A detailed and clear ethics contains the accumulation of experience and wisdom of many people, which helps people to tell the right from the wrong in face of complex cases.^[18] In the process of the construction of the project, it needs a continuous improvement in the moral codes of ethics to make a soft constraint on the decision-making of engineering, the engineering design, and project execution from the moral perspective. And ethical regulation refers to a kind of ethical guidelines, which help engineer, engineering technical personnel and workers to understand their professional ethics connotation moral standards and more specific professional liability. Under the guidance and constraints of ethical rules, when the engineer, engineering technical personnel and workers face ethical conflicts in the process of the construction, they will know "what to do" and "what not to do", so that their behaviors are in accordance with the public and social interests, continually avoiding ethical problems. The author thinks that the construction of engineering ethics rules should pay attention to the following two aspects: firstly, it should be based mainly on occupational morals and professional ethics ideal. Where there is no moral ideal, there is no career. "A career is set up by carrying out the work (and following) the right standard to serve its choice of moral ideal, and beyond these standards required by the law, market, moral and other public thought."^[19] In short, the ideal practitioners would regulate their own behavior with higher professional standards, instead of obeying the order and abiding by the professional morals. They could eventually practice in various positive and rational ways and promote the ideal of human well-being. Secondly, the content of the articles of engineering ethics' associations should advance with the times on the basis of practice. With the rapid development of economy, the continuously

deepening understanding of engineering technology and the expanding impact of the project on society and nature, the terms related to environmental protection and sustainable development have been explicitly written in ethical codes. The ethical articles of engineering professional associations in Japan, Germany, France, also have developed from scratch, from less to more, from the shallow to the deep understanding.^[20] At present, as the articles of association of engineering ethics is continuously broadening the horizon, the corresponding terms should also be more and more detailed and perfected. The ethical content, which are of important value about human well-being and environmental protection, against discrimination, will also play a positive role in the process of the construction.

4.4 Strengthening engineering ethics education and improving the ethical quality of the project participants

The process of construction of the project is participated by government officials, project decision makers, project supervision personnel, engineers, engineering technical personnel and engineering construction personnel. Their behaviors, which would be influenced by a certain interests, values and ethics, play a decisive role in whether the project can be carried out smoothly. Therefore, their behavior should be guided by the ethical principles, and should be responsible for environment, the public, society and future on the basis of the principles of fair, sharing, rational development, sustainable development and compensation. So, it is particularly significant to carry out moral education in the process of project construction. Firstly, professional university teachers and senior engineers should be hired to preach the ethical knowledge. Through the combination of theory and practice, the participants of project could receive the short-term systematic training and make a clear definition of the social responsibility of the participants themselves, and make the project participants to abide by the professional ethics. At the same time, it will also ensure the health, welfare and safety of members in the community in the first place. Secondly, attention should be paid to the analysis of multiple ethical relationship of project, which includes such microscopic ethical relationship as the relationship between the engineers and colleague and employers, and such ethical relationships as between project and nature-society -human, as well as the ethical relationships of medium level: between project and politics-economy- culture-defense. Finally, through the discussion of the cases, the professionals' sensitivity of ethical problems will be promoted and their ability to analyze and solve the ethical problems will be strengthened in the specific situations. Case teaching, initially developed by the business school of Harvard University, has now been extended to medicine, management, law and other disciplines.^[21] For example, the ethical problems of vertical analysis and horizontal comparison of the Three Gorges project, provides a

useful reference for the solution of the ethical problems of the project and also avoids the similar ethical problems. It has laid a solid foundation for the smooth implementation of the south to north water diversion project.

5 Conclusion

The south to north water diversion project is a magnificent project across the river, which has played a huge role in relieving water crisis in the north and achieving the north-south economic growth altogether. Although the middle route of south-to-north water transfer project has solved the water consumption problems of people in more than 100 cities, concerning industry and agriculture, there are also severe challenges, opportunities and difficulties in the process of engineering construction. On the one hand, the south-north water diversion project improves the condition of water resources in Northern China, such as high fluoride water, brackish water, and other water containing harmful substances, and promotes these areas to save water and to reduce the pollution of water. It further exploits the potential productivity to achieve real economic growth by improving the condition of water resources. On the other hand, engineering ethical problems, caused by the construction of project, have not been paid enough attention by the government, enterprises, engineers and construction personnel.

From the current study, researchers are mostly non-professionals, and do not know how to start with the technical details involved in the project, while, technical personnel are not familiar with the project and ethical issues. Therefore, when it comes to specific technical problems in engineering practice, researchers would analyze the effects caused by the construction, and almost don't involve the ethical issues in the process of engineering design. So, the author, by reading a large number of related materials, from the perspective of engineering ethics theory, analyze the ethical issues caused in the process of project construction, namely ecological problems, resettlement issues, security issues, and puts forward some ways of solving the problem: setting up engineering ethics committee; carrying out engineering ethics education, improving the ethical quality of engineer and engineering technical personnel; and building the ethical rules of south-north water diversion project. In a word, the study on the ethical issues of the process of construction of the south-to-north water diversion project plays a huge role in solving the ethical issues of engineering construction, and in promoting the construction smoothly. At the same time, further perfecting the theory of engineering ethics and institutionalized construction will lay a solid foundation of the guidance and supervision in the process of project construction. The innovation of this article is to analyze and study the problems from a "community subject" and a "systematic" perspective.

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