Information Management on the EIA Approval Process

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Abstract: Environmental Impact Assessment (EIA) is an effective measure to protect the environment and promote sustainable economic development. The Chinese government's environmental protection departments at different levels generate a large number of EIA approval data every year, which can provide important support for environmental management and macro decision-making. However, for various reasons, it was difficult to capture and use these data which were relatively scattered, and which therefore hindered the effective use of environmental information for sharing and decision making. Collecting the EIA approval information at different levels and strengthening its analysis and application is therefore important work. This paper introduces the related improvement work and progress on EIA information management in China, including the work undertaken to collect the EIA approval information based on an Information Technology (IT) network, setting up an EIA approval data center and the software platform and data submission channels for all levels of project EIA approval information. In addition, this paper puts forward suggestions to further enhance EIA data quality control and data utilization, efficiency and information security in China.
Key words: Environmental impact assessment, Information management, Network

Environmental impact assessment (EIA) is the methods and system that analyzes, predicts, and evaluates the environmental impact that the implementation of development plans and construction projects might cause, proposes countermeasures and measures to prevent or mitigate adverse environmental impact, and conducts follow-up monitoring of the impact. Since its implementation in China, EIA has played an important role in protecting the environment and promoting sustainable economic development. With the continued rapid economic development, environmental protection departments at different levels of government in China have generated a large number of EIA approval data, especially project EIA data every year, which can provide important support for environmental management and macro decision-making. However, for various reasons, it was difficult to capture and use these data which were relatively scattered, and which therefore impaired the effectiveness of environmental management. In particular, after the implementation of the "Streamlining Administration and Delegating Power to Lower Levels" reform, it is especially important to use these data to strengthen support for EIA supervision and macro scientific decision-making. Collecting the EIA approval information at different levels and strengthening its analysis and application is critical work.

This paper introduces the related improvement work and progress on EIA information management in China, including the work undertaken to collect the EIA

approval information based on an IT network, setting up an EIA approval data center and the software platform and data submission channels for all levels of project EIA approval information. In addition, this paper puts forward suggestions to further enhance EIA data quality control and data utilization, efficiency and information security in China.

1.The status quo of EIA approval and information management issues

EIA in China is usually divided into three types: regional EIA, planning EIA and project EIA, which is the most common type. The project EIA approval is an important step for the implementation of a development project. In accordance with the extent of environmental impact, project EIA approval in China is divided into four levels: the national level, the provincial level, the prefecture level and the county level. In accordance with their respective jurisdictions, environmental protection departments of governments at different levels carry out the project EIA approval at the corresponding level, and annually approve a large number of project EIA documents. For example, in 2017, provincial level, prefecture level, and county level environmental protection departments approved about 2000, 40000, and 140,000 project EIA approval documents respectively.

In the past, the project EIA approval data generated by environmental protection departments at different levels were managed by themselves, which led to data being easily lost. In addition, because the exchange of information between different levels and the same level of environmental protection departments was poor, the data generated by different environmental protection departments were relatively isolated.

The lack of centralized, unified, scientific and standardized management of project EIA approval data has greatly hampered its sharing and utilization, which makes it difficult to provide services that make use of these data for environmental management and macro decision-making.

2.Information management on the EIA approval process

2.1.Initiation of EIA approval information submission work

In 2016, the Ministry of Environmental Protection publicly released a notice, which asks that project EIA approval information be submitted via an approved network. The target, content, methods, format, technology, schedules and organization of information as part of the submission was also clearly indicated in this notice. In terms of organization and division of work, the national environmental protection department is responsible for coordination and supervision in general, together with compiling technical specifications, construction information systems, ensuring software operation stability and providing technical support services. Local environmental protection departments are responsible for providing human and material resources, defining data submission departments and persons to ensure that data submission tasks are finished in time.

In addition, the national environmental protection department has organized several work scheduling meetings and training sessions, to summarize the progress

and to exchange experiences and lessons, to help solve the difficult problems in the work. Such initiatives aim to further promote the implementation of information submission.

2.2.Software of EIA approval data center and supervision platform

After exhaustive surveying of the requirements of an EIA approval data management system and the status quo of environmental protection information, two software systems, an EIA approval data center (Figure 1) and supervision platform, were constructed and operated online based on network and cloud computing technology.

Project EIA approval data from different channels and different jurisdictions were clustered into the EIA approval data center, which gradually generated an EIA approval data resource pool. Using this data resources, the EIA approval data center provides functions such as data query, data statistical analysis, data quality control, data management, together with user and system management functionalities. After integrating EIA approval data and uniting other data in the environmental protection system together with external data from the environmental protection system, the EIA approval supervision platform provides information services for EIA supervision, environmental quality forecasting and warning, and macroeconomic situation analysis.

Figure 1 Software interface of national EIA approval data center

2.3.Three type and four-level data submission channels

Firstly, from a technical perspective, three types of EIA approval data submission channels were established, to satisfy different jurisdictions' data submission requirements and existing information management systems (Figure 2). In detail, jurisdictions which have an EIA approval information systems and connect to the environmental protection private network (EPPN) can submit data through an information exchange platform in EPPN. Jurisdictions which don't have an EIA approval information system but connect to EPPN can submit data through the project EIA approval information submission system. Jurisdictions which don't connect to EPPN or temporarily suffer EPPN network faults can submit data through FTP

protocol through the internet.

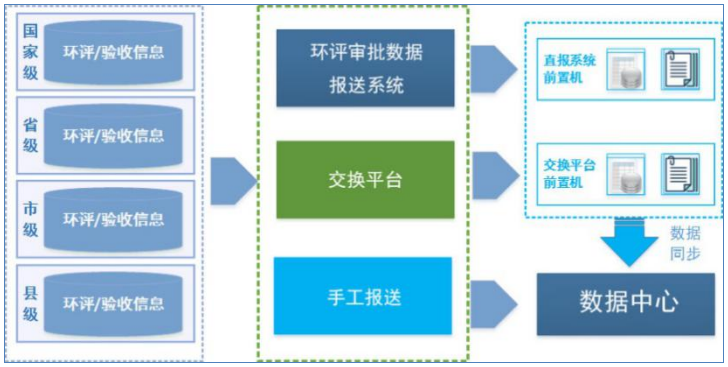

Figure 2 Schematic diagram for three data submission channels based on network

Secondly, from a practical perspective, through linking local environmental protection departments with submission channels and the EIA approval data center one by one, a four-level data submission workflow containing 1 national level, 32 provincial levels, more than 400 municipal levels and more than 2,000 county-levels was established.

2.4.Implementation of data real-time submission and analysis

Hundreds of thousands of project EIA approval data, including project name, EIA document type, time of acceptance, industry type, construction site, total investment, environmental protection investment and so on, were collected and integrated into the data center. In addition, data statistical analysis was conducted to compose a research report to support environmental management decision-making. Other data applications were carried out to provide support for a macroeconomic situational analysis, excess production capacity resolve and environmental "neighborhood" effect prevention, amongst others.

Figure 3 Statistical diagrams of EIA approval data

3.Information management on the EIA approval Prospects

3.1.To improve EIA approval data quality control

Data quality is a key factor related to the effectiveness of data applications. Although some technical measures have been taken to ensure the quality of EIA approval data, the data still have some quality shortcomings in terms of timeliness, completeness, standardization and accuracy, due to the obvious characteristics of EIA approval data such as its wide range, complicated contents, strong professionalism, and large volume, which hinders the effectiveness of data application. In future, measures from various aspects such as work mechanisms, technical, software and teams, should be adopted to improve data quality throughout the entire life cycle including data collection, data transmission, data storage, data management, data processing and data utilization.

3.2.Enhancing the users and efficiency of EIA approval data

The first intention is to expand the scope of data application services. Currently, EIA approval data mainly serves environmental protection departments. It is suggested that the form of information dissemination and service could be innovative in follow up to strengthen data sharing in order to provide services to enterprises and the public, which can promote the value-added use of EIA approval data.

The second is to strengthen data mining and analysis. Traditional analysis methods face certain technical difficulties when dealing with professional and complex EIA data. Thus, it is recommended that advanced technologies such as natural language processing, machine learning and high-performance computing are used to improve data mining and analytical capabilities to provide more accurate and efficient services for environmental management and decision making.

3.3.Safeguarding the security of EIA approval data

The EIA approval data center has collected a large volume of data across the whole country and these data are continuously being updated. These EIA approval data, which includes information on enterprises, project location, pollutant discharge, industry scale and process parameters, amongst others, are important strategic resources for environmental science and technology innovation and economic and social development. It is therefore important that information security awareness, methods and measures should be strengthened in relation to data, networks, software, deployment and other aspects in future.

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