

Design of Information System for Preventing and Controlling Environmental Pollution at County Level

Zhao Kunrong¹, Wu Shuang², Xu Wenjun², Jia Yan^{1,*}

¹No.16-18 Ruihe Road, Huangpu District, Guangzhou, PR China

²No.7 Courtyard, Yuancun West Street, Tianhe District, Guangzhou, PR China

jiayan@scies.org

*Corresponding author

Keyword: Prevention; Control; Environmental Pollution; information technology

Abstract. On the basis of the on-line monitoring system of pollution sources and ecological environment that has been built up, the county environmental pollution prevention and control information system has been built and integrated into the existing information business system of the state, provinces and cities. Realize the information environment management pattern of real-time monitoring of environmental quality, collaborative management of environmental business, data interconnection between upper and lower levels, and a large number of data to assist decision-making.

1. Introduction

Faced with the dual demands of environmental improvement and responsibility pressure, the State Council and the Ministry of Ecology and Environment have successively issued *the Platform for Action to Promote the Development of Big Data* and *the Overall Plan for the Construction of Big Data of Eco-environment*. It is proposed that large data should be used to drive the modernization of environmental governance capacity, enhance government governance capacity, enhance the level of government decision-making and risk prevention, and improve the accuracy and effectiveness of social governance.

Focusing on the goal of "fighting the key battle of pollution prevention and control", we build an integrated "integrated solution of pollution prevention and control informatization" by means of information technology such as Internet of Things, big data, visualization and so on. Through this solution, the aim is to provide intelligent office means and insight into the overall ecological environment information for the ecological environment management department.

2. Requirement analysis

In the grassroots ecological environment, there are still some irregularities such as "failing to publicize information according to requirements", "advance examination and approval", "reducing the categories of EIA documents" and so on. Through the establishment of environmental protection approval system, the steps and processes clearly required by laws and regulations are immobilized and standardized, and the examination and approval behavior is monitored in real time through the system, thus avoiding the occurrence of violation of regulations.

Focusing on the informationization needs of ecological environment management, on the one hand, various management systems of ecological environment data acquisition and transmission, data storage, large data analysis, sharing and publishing should be formed, normalized data aggregation and sharing application management system should be established, and unified access of enterprise-side monitoring, atmospheric environmental quality, water environmental quality and

environmental monitoring data should be promoted to get through the ecological environment data. The vertical and horizontal channels of resources can realize the sharing service of large data information in ecological environment and improve the service level of data resources application. On the other hand, we should improve the basic technology service capability, build a centralized application support service technology system, provide unified technical services for the development and construction of application systems, provide integrated technical basis support for the construction of pollution prevention and control information technology, and comprehensively enhance the information technology support capability.

Around the requirement of tackling the key battles of pollution prevention and control, on the basis of data integration and combined with GIS technology, a map of the situation of tackling the key battles of pollution prevention and control is formed, and the overall situation of the ecological environment is displayed in the form of intuitive charts; the map of the ecological environment is drawn to highlight the target gap and clarify the environmental base; the current situation and tasks of tackling the key battles of pollution prevention and control are explained clearly; and the leading stand of pollution prevention Leaders should grasp the need of progress in the battle of pollution prevention and control in real time, so as to achieve clear responsibilities, clear tasks, clear objectives and clear status quo.

3. System construction

Focusing on the idea of "clarifying the current situation - precise supervision - intelligent office", we should build a comprehensive application of pollution prevention and environmental quality improvement.

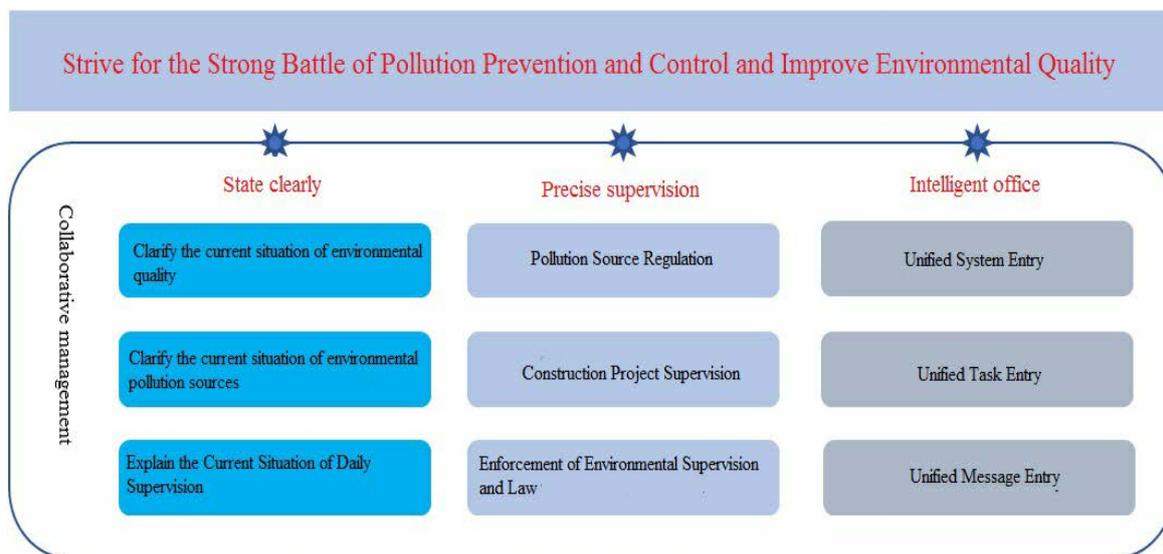


Figure1 Comprehensive application of pollution prevention and environmental quality improvement

(1) Unified Office Portal

Establish a unified environmental protection intranet work portal in the county, centralize the management of all relevant environmental business information systems in the county, and realize the application mode of "a set of users, network access" in the county. The internal network work portal is centrally deployed on the internal network of EPA. Users include the internal departments of EPA and the users of directly affiliated units. They publish the information, announcements, news and the unified entrance of main business tasks, business statistics and business systems on the unified internal network work portal of EPA, so as to realize the unified management and

application of the environmental information system.

(2) Pollution Sources One Enterprise One Class

In view of the situation of pollution sources in the whole county, the establishment of a professional management system of pollution sources, one enterprise and one file, from the beginning of EIA of construction projects, is a whole process from "life" to "death" of pollution sources, which has gone through sewage permit, sewage declaration and charging, environmental letters and visits, environmental monitoring, administrative penalties, pollution source monitoring and so on until the enterprise is cancelled. The platform integrates all the resultant data of pollution sources from "life" to "death", establishes a set of independent files for each pollution source, and realizes the supervision and management of pollution sources throughout their life cycle.

(3) Precision Law Enforcement-Mobile Law Enforcement System

Combining with environmental supervision and law enforcement business, it manages the application of environmental law enforcement business, realizes the concepts of intelligent law enforcement at the front-end and comprehensive supervision at the back-end tasks, and matches the pollution source "one enterprise and one file", so as to make the mobile law enforcement system related to pollution source file information, construction project approval information and online monitoring information.

(4) A map of the ecological environment

Through the collection of pollution source data, environmental law enforcement data, air quality data and water environment data, the data are comprehensively displayed.



Figure 2 Map of the ecological environment

4. Conclusion

In order to meet the decision-making needs of the county government, a central control center is set up in the county environmental protection bureau. The data of pollution source management, water and gas environmental quality, project environmental assessment and approval, petition and complaint, administrative penalty and other business processing data are all linked and linked together to conduct overall analysis. The analysis results are visualized in multiple forms by using GIS and displayed on a platform interface. Provide leadership with a visual display platform of macro, intuitive, complete information, large amount of information and prominent key information.

References

- [1] Liu Huiling, Cai Yanguang, Qiu Xuqin. Research and implementation of intelligent industry application and sharing platform based on Internet of Things [J]. Electronic World, 2014 (23).
- [2] Xu Min, Sun Hailin. From "Digital Environmental Protection" to "Intelligent Environmental Protection" [J]. Environmental Monitoring Management and Technology, 2011 (4).
- [3] Li Lin, Li Shifeng, Liang Xing. Research on the Construction of Space-time Information Cloud Platform for Smart City [J]. Geospatial Information, 2016 (12).