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# Effectiveness of environmental protection and low carbon work based on 5P model. -- A case study of Boxing County in Shandong Province

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**Abstract.** Human resource exists in all management work. The 5P model is the top priority of human resource management and the foundation of human resource management. Applying the 5P model to public institutions in China, a reasonable management system can be established, which takes job design as the premise, personnel selection as the key, performance management as the core, salary management as the focus, and improving work enthusiasm as the auxiliary.

**Keywords:** 5P model; Environmental protection and low carbon working mechanism; The human resources.

## 1. About 5P Model

The 5P model is a relatively new theoretical model. Experts say that HRM is still in a state of ignorance in the People's Republic of China, mainly learning the advanced management mode of western developed countries. However, in China, there is no theory or practical experience of its own. So we designed our own 5P model not to be different, but to reflect the nature of management and the logic between them. The 5P model centers on the organization's development strategy. In an organization, "people" and "posts" are the basis of the core, the core of the core, namely job design, personnel selection, performance evaluation, salary design, work enthusiasm. There is a high degree of match between people, between people and posts, between posts and posts, and between people and enterprises. This model pays attention to step by step, according to a certain level. Not everything goes on at the same time. Start with the initial job design step by step. The five links complement each other to provide a boost to the management process.

## 2. Possibility of the application of the 5P model

With the gradual transformation of the Chinese government, the environmental protection and low-carbon work in China is also undergoing great changes. However, the 5P model is the tool used in this change. The five factors of the 5P model and the connection between them play a good guiding role in the human resource management of environmental protection and low-carbon work. The management work is very complex, and this model can help managers to grasp the root of the problem and find the balance point.



### **3. Effectiveness of 5P Model in Environmental Protection and Low-carbon Working Mechanism -- Taking Environmental Protection Bureau of Boxing County, Shandong Province as an example**

Through on-the-spot evidence, among Binzhou City, Boxing County Environmental Protection Bureau in Shandong Province, the job allocation is meticulous. It has a reasonable institutional arrangement and conforms to the framework system of the 5P model. It is the most representative public institution in Binzhou. For several years, Boxing County Environmental Protection Bureau on environmental protection and low-carbon work to carry out vigorous reform, from the township to the entire county. Environmental protection low carbon work for five consecutive years increase rapidly, through questionnaire survey and data collection method, starting from 2016, boxing carbon dioxide emissions, decreasing by 5.72% per year on average, at the same time, the core of the county area and countryside towns in the update drainage equipment every year, amount of coal combustion in the village of decreasing by 7.2% per year on average nearly five years, which greatly accelerated the pace of life environmental protection low-carbon economy. The reason for this achievement is that, in addition to the upgrading of equipment, the Environmental Protection Agency has played a significant role in staffing and staffing. From the statistical data, Boxing County Environmental Protection Bureau is the core department of environmental protection and low-carbon work, but also the most representative department.

#### *3.1. Job design of Boxing County Environmental Protection Bureau*

5P model job design, also known as position management, according to the investigation, the organization setup of Boxing County Environmental Protection Bureau is as follows:

**Bureau office:** responsible for rural part the core work of the environmental protection bureau, secretarial, archives, secrecy, intervention is inseparable from the bureau of safety management of the office, in addition, vehicle scheduling, the office logistics affairs and administration office meeting, the enacting body internal management rules and regulations, be responsible for rural part environmental protection bureau of personnel management, salary management and the global cadres and workers of political thought education, contact boxing villages and towns and other temporary work task. Requires the office to formulate the final implementation plan and give orders.

**Finance Unit:** It is an important department second only to the office of Boxing Environmental Protection Bureau. It manages the finance and assets of Boxing Environmental Protection Bureau, prepares and reports the annual fund use plan, formulates financial management system, works on monthly and annual statements, and collects and pays the pollution discharge fee and related fees. Must be implemented by the financial unit in accordance with the rules and regulations seriously. Conscientiously implement financial management system, do well the accounting work of Boxing Environmental Protection Bureau.

**Supervision and Management Unit:** Responsible for supervising and supervising the implementation of the "environmental impact assessment" and other systems of Boxing County construction projects, actively participating in coordinating the relationship with relevant departments, implementing the principle of relatively fair voting for environmental protection and prohibiting fraud. Keep abreast of new projects in Boxing County in time. Prepare environmental impact statement (form) according to relevant policies, review and approve the environmental impact statement form, and send the approval materials to the station, unit, team and office. To meet the acceptance conditions of the project, timely organize the relevant personnel to carry out acceptance, and the acceptance documents filed.

**Legal XuanChuanGu:** implement and enforce national environmental protection policy, policy, laws and regulations, and formulate the county environmental regulatory documents, the boxing citizens in a timely manner, the environmental protection legal system education, regularly review rural part environmental protection bureau and administrative litigation, administrative punishment cases responsible for training the employees, boxing industrial management of the factory. Responsible for environmental publicity and news reports of Boxing Environmental Protection Bureau, organized

publicity activities for World Environment Day as required, promoted environmental education, and guided the establishment of Binzhou Green School. And actively promote clean production audit, ISO14000 environmental management system and environmental label product certification work, guide the development of circular economy, environmental protection industry and clean production in Boxing County.

**Pollution Control Unit:** to organize the preparation of Boxing County environmental protection plan and plan and environmental function zoning; To supervise the implementation of national and industrial standards for environmental protection; to be responsible for the compilation and proofreading of environmental quality reports. To supervise and administer the prevention and control of pollution caused by waste gas, waste water, waste residue, dust, toxic chemicals, radioactivity, light pollution, electromagnetic radiation, noise, vibration and motor vehicles; To undertake comprehensive improvement of environmental management in Boxing County; To organize the establishment and protection of qualified drinking water source protection areas; To be responsible for the construction and daily management of smoke and dust control area and noise control area; To be responsible for the supervision and assessment of the implementation of the environmental protection responsibility system undertaken by the responsible units; To be responsible for environmental management systems such as deadline control of pollution sources, total quantity control and standard discharge, operation permit of hazardous waste, registration of import and export of toxic chemicals, etc.

**Environmental monitoring stations:**

1. Formulate monitoring plans and carry out regular monitoring of the quality of various environmental elements in Boxing County in accordance with the unified requirements of the state. Submit the monitoring data to the superior station regularly and prepare the environmental quality report of Boxing County;

2. Periodically or irregularly monitor units that discharge pollutants in Boxing County, establish pollution source files, supervise and inspect the implementation of various environmental laws and standards by each unit. Provide monitoring data for environmental management such as emission charges;

3. To complete the monitoring tasks required by the competent environmental protection authorities for environmental management;

4. Participate in the investigation of pollution incidents in Boxing County, and provide monitoring data for arbitration of environmental pollution disputes;

**Environmental Monitoring Team:**

1. On-site supervision and inspection of Boxing County enterprises, public institutions and individuals in the operation of pollution prevention and control facilities, supervision and inspection of the implementation of various permit systems, supervision and inspection of Boxing County pollution and damage to the natural ecological environment;

2. Investigate environmental pollution accidents in Boxing County, coordinate and deal with environmental pollution disputes; To undertake proposals of Boxing County People's Congress and CPPCC

3. Responsible for the declaration and registration of sewage discharge in Boxing County, and collection of sewage discharge fees according to law.

**Institute of Environmental Sciences:**

Organize the popularization and publicity of environmental science knowledge, improve the popular science knowledge level of the people, actively promote advanced environmental protection products, provide technical services for the development of organic food, and cooperate with enterprises to develop environmental protection products.

To provide Boxing County with environmental impact assessment, environmental pollution control projects and other technical services, to guide and participate in pollution enterprises to do a good job of governance.

This is the first link of the 5P model, which is also the basic link. If the basic link is not well prepared, the 5P model cannot be applied to practice at all. The core of human resource management is

to make the employees of the department competent, capable and willing to work. Sometimes, the laziness of employees is not the fault of the employees themselves, but a major deficiency in the work of the human resource management department, which leads to a great decline in the enthusiasm of the employees, and finally, they can only leave the company collectively. According to the institutional setting of Boxing County Environmental Protection Bureau as a reference, it is not difficult to judge that the job design of the institution is more reasonable. With the Bureau Office as the core, it drives other departments to operate together and serves the Environmental Protection Bureau. The financial department is the core and controls the economic lifeline of the unit. At the same time, it includes all the charges from the outside world. To some extent, this restricts the abuse of fuel by various heavy industrial enterprises and township residents, forcing the residents of Boxing County to reduce the use of fuel and save by themselves. As time passes, the pace of environmental protection and low carbon will accelerate. At the same time, the supervision and management unit, pollution control unit, environmental monitoring station these three departments mainly for the outside world, the supervision of other departments of the environmental impact statement of the legal and illegal situation, the county emissions of pollutants more serious units will be irregular monitoring, the establishment of pollution archives and at any time to provide pollution data. The environmental monitoring brigade shall conduct field visits at any time and punish illegal acts according to law. The division of responsibilities of each department is clear, and employees should be fully empowered to make them competent, capable and willing to work. To keep green and low-carbon jobs running in the EPA's power chain.

**3.2. Boxing County Environmental Protection Bureau personnel selection:**

After the visit, Boxing County Environmental Protection Bureau leadership information is as follows:

**Table 1. Boxing County Leadership Post Information Table**

Name	Yanglin Zheng	Position	Secretary of the Leading Party Members' Group and Director General
		Management field	Preside over the overall work, responsible for personnel, financial and other aspects of the work
Name	Zhenguo Lin	Position	Member of the Party Leadership Group and chief section member
		Management field	Assist Zheng Yanglin to preside over the daily work of the bureau, preside over the work of the party branch of the bureau, responsible for the work of party discipline, clean government construction, EIA review and approval of construction projects, environmental protection acceptance and regional EIA, etc. In charge of the office, environmental assessment unit, to assist Comrade Zheng Yanglin in charge of the financial unit
Name	Litao Wang	Position	Member of the Leading Party Members' Group and Deputy Director General
		Management field	Responsible for total pollutant total emission reduction, construction project audit, environmental protection, pollution within a time limit for examination and approval of governance plan, the discharge permit issued, environmental statistics and environmental emergency, waste management, environmental assessment, the mandatory monitoring, environment quality monitoring,

			environment quality release, supervision and monitoring, monitoring facilities maintenance management, etc. In charge of total volume office, watershed emergency unit, air prevention holding unit, solid waste and soil environment management unit, monitoring station.
Name	Fucui Ren	Position	Party member group, deputy director section member
		Management field	Responsible for legal standardization, legal document review, clean production audit, radiation, radioactive source management, environmental protection work publicity, planning, public opinion disposal, etc. In charge of the Legal Unit, Publicity Unit and the window of the County Public Administration Service Center; assisted Lin Zhenguo in charge of the EIA Unit.
Name	Qingsheng Li	Position	Director of the urban sub-bureau and leader of the supervision brigade
		Management field	To be responsible for the declaration, registration and verification of pollutant discharge, collection of pollutant discharge fees, investigation and punishment of environmental violations, environmental safety, environmental complaint and visiting, and handling of proposals by NPC deputies and CPPCC members. In charge of supervision brigade, urban branch, Hubin branch, Xingfu branch, Chen household branch, Pang family branch.

According to on-the-spot evidence, Boxing County Environmental Protection Bureau has a very strict selection process of its own in the leadership selection. First, prospective officials have to submit a written request, but this is only the first step. Next, is the most crucial link, namely the qualification examination. This is also a part of the decision whether the employee can take the written exam, if the employee is lucky enough to pass the first two parts, the written exam is a more serious challenge. It examines the theoretical ability and comprehensive quality of employees, and is also a link that accounts for the largest proportion. Once that is done, there will be a final democratic vote. If the vote doesn't pass, you still can't win. To sum up, in terms of personnel selection, Boxing County Environmental Protection Bureau takes several screening measures to ensure the quality of employees, and the enthusiasm of the selected employees is guaranteed. At the same time, environmental protection and low-carbon economy is a very complex process, which requires the joint efforts of a large number of theoretical talents and practical workers to complete. It has been a long and arduous process. It takes a lot of cleaning equipment and supervision, a lot of data to sort through and build a big database. Therefore, personnel selection and selection of high-quality officials who meet the requirements are also paving the way for future big data work.

### 3.3. Performance evaluation of Boxing County Environmental Protection Bureau:

After half a month of evidence collection by the Environmental Protection Bureau, through the employee visits. Determining the EPA's performance evaluation method based on attendance and leave:

#### (I) Attendance:

1. Strictly abide by the work and rest schedule, work on time, and use the attendance machine to check in attendance four times a day. The effective attendance time is within 30 minutes before the start of work. There is no specified time for the effective attendance time after work.

Members of the ecological environmental protection comprehensive law enforcement squadron attend attendance check in the morning of every working day, and the other time attendance check is organized by the unit they belong to.

2. Those who fail to check in on time due to departure should fill in the departure approval form on the same day. The general staff should be approved by the head of the stock market (brigade, center), the middle level official position should be approved by the leader in charge, the team members should be approved by the director and reported to the personnel unit for record.

Leave formalities should be dealt with before attendance. Leave, departure, etc. are subject to the approval form.

(2) Leave:

Those who live differently from their parents and spouses and cannot reunite on public holidays can enjoy the treatment of their parents and spouses if they have worked for a full year.

1. To visit the spouse, one party shall be given a 30-day home leave every year.

2. Unmarried employees will be given a 20-day leave every year to visit their parents, or a 45-day leave every two years according to the actual situation.

3. Married employees will be given a 20-day leave every 4 years to visit their parents. Visiting family holiday is to show the time that worker and spouse, parents reunite, additional, according to actual need is based on distance holiday. All the holidays mentioned above include public holidays and statutory holidays.

4. In case of the death of the employee's immediate family member or main collateral family member, one to three days of bereavement leave shall be given as appropriate.

5. If employees apply for paid leave, they can apply for the following types: formal employees who have worked for more than 1 year but less than 10 years can take 5 days off per year; If the period is longer than 10 years but less than 20 years, the annual leave is 10 days; For those who are older than or equal to 20 years, the annual leave is 15 days.

Judging the annual performance of an employee based on the number of attendance and leave of the employee is a simple human resource management measure within the organization, but it has a deeper and reliable guarantee for environmental protection and low-carbon work and the realization of low-carbon economy. Prevention of pollution is the top priority of low-carbon life, pollution will exist all the time. Data should be analyzed and recorded into the database every day, and pollution indicators should be reported by relevant personnel, and pollution analysis reports should be written by relevant experts. The work process is full of hard points. However, the experience of employees is limited, and it is impossible for any employee to work all the time. Therefore, the measures of performance evaluation can realize the mode of rotating work among employees. Ensure that all employees are well organized. Pollution indicators can be measured all the time, and important measurement data will not be missed. The final level of environmental pollution reporting error will be reduced.

#### *3.4. The compensation design of Boxing County Environmental Protection Bureau*

The 5P model is an exact sequential model. Only with the smooth implementation of the first several items, can the final link be carried out in an orderly way. Reasonable compensation design is also to ensure that the retention of employees, so that employees are capable, will do, willing to do the core content. According to the investigation, Boxing County Environmental Protection Bureau's salary is mainly based on the performance of its employees. On pay day, the EPA will deduct and increase the final salary of an employee based on the number of times an employee clocks in during a period and the number of times he or she applies for family leave, bereavement leave and paid leave. In addition, the final results are publicized and employees are allowed to review within a certain period of time.

#### **4. Environmental protection and low carbon work results -- take Liqiang New Material Co., Ltd., Boxing County, Shandong Province as an example**

Shandong boxing power new material co., LTD. Was established in November 2009, is located in boxing DianZi Town concentration zone project, the main construction of the proposed construction



project 1 the heat capacity of 320000 tons of aluminium zinc steel plate production line and 2 240000 tons of colorized painting steel production line, and the corresponding supporting facilities construction and environmental protection facilities, covers an area of 11583 m<sup>2</sup> factory area planning, project total investment is 178.1 million yuan.

The air pollutants discharged by the planned project are mainly NaOH, acid fog, non-methane total hydrocarbon, etc. After taking appropriate control measures, they can all be discharged to the standard. The organized emissions of NaOH, acid fog and non-methane total hydrocarbon (including toluene and xylene) of the proposed project were 0.05t/a, 0.09t/a and 8.45t/a, respectively (toluene 0.59t/a and xylene 5.45t/a). The unorganized emissions of NaOH, acid fog, zinc dust, non-methane total hydrocarbon (including toluene and xylene) and ammonia of the proposed project are 0.1t/a, 0.18t/a, 0.064t/a, 12.27t/a (including toluene 0.61t/a and xylene 5.52t/a) and 0.193t/a, respectively. Volatile organic matter emission was 20.72t/a. It was 8% lower than the previous year's total emissions.

Project wastewater including resin regenerated wastewater and cleaning wastewater, water quenching cooling wastewater, finishing wastewater, oil/water separation of wastewater, acid wastewater and alkaline wastewater, washing wastewater and sewage workshop ground, quantity is 268.28 m<sup>3</sup> / d, 78199.2 m<sup>3</sup> / a, all the new sewage treatment station into the factory processing, to achieve "iron and steel industry in shandong province pollutant emission standard" (DB37/990-2013) and boxing DianZi Town sewage treatment plant, the back into the municipal sewage pipe network. After the sewage treatment plant reaches the level A standard of "Pollutant Discharge Standard for Urban Sewage Treatment Plant" (GB18918-2002), it is discharged into Gengguo underground ditch. The maximum daily discharge of the project wastewater is 268.28m<sup>3</sup>/d, 78199.2m<sup>3</sup>/a, and the annual production of COD and NH<sub>3</sub>-N are 75.53t/a and 2.57t/a respectively. After being treated by the plant sewage treatment station, the amount of waste water into the sewage treatment plant of Dianzizhen is 268.28m<sup>3</sup>/d, 78199.2m<sup>3</sup>/a, and the annual discharge of COD and NH<sub>3</sub>-N are 15.64t/a and 1.17t/a respectively. The amount of wastewater treated by sewage treatment plants into the external environment is 268.28m<sup>3</sup>/d, 78199.2m<sup>3</sup>/a, the annual discharge of COD and NH<sub>3</sub>-N are 3.91t/a and 0.39t/a respectively. That was a 6.43% drop from the previous year's total.

## 5. Boxing County environmental protection and low carbon effect

**Table 2.** April Air Quality Data Table of Boxing County

Air quality in Boxing County on March 8
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site	PM2.5( $\mu$ g/m <sup>3</sup> )	PM10( $\mu$ g/m <sup>3</sup> )	Nitrogen dioxide( $\mu$ g/m <sup>3</sup> )	sulfur dioxide( $\mu$ g/m <sup>3</sup> )	carbon monoxide( $\mu$ g/m <sup>3</sup> )	ozone( $\mu$ g/m <sup>3</sup> )	Primary pollutant
Concentration of measuring points in People's Park	131	186	80	39	1.4	131	PM2.5
Concentration of measuring points in People's Park	132	177	78	37	1.7	132	PM2.5
County urban average concentration	132	182	79	38	1.6	132	PM2.5
Meteorological data	Wind direction: southeast wind ( $\leq$ force 3); Temperature: 5-14 $^{\circ}$ C; Weather: Cloudy						
Air quality in Boxing County on March 9							
site	PM2.5( $\mu$ g/m <sup>3</sup> )	PM10( $\mu$ g/m <sup>3</sup> )	Nitrogen dioxide( $\mu$ g/m <sup>3</sup> )	sulfur dioxide( $\mu$ g/m <sup>3</sup> )	carbon monoxide( $\mu$ g/m <sup>3</sup> )	ozone( $\mu$ g/m <sup>3</sup> )	Primary pollutant
Concentration of measuring points in People's Park	143	202	71	30	1.3	127	PM2.5
Concentration of measuring points in People's Park	151	201	73	41	1.7	129	PM2.5
County urban average concentration	147	201	72	36	1.5	128	PM2.5
Meteorological data	Wind direction: southeast wind ( $\leq$ force 3); Temperature: 5-17 $^{\circ}$ C; Weather: cloudy to sunny						

After field forensics, March 8, and on March 9, boxing is the most representative for two days, because these two days compared the most distinct, the pollution index decline is nearly five years of the two days at most, and boxing each rank township's air quality is also the biggest change for two days, some urban air quality, with reasonable management and control has become the county town of benchmarking.

## 6. General

Environmental protection and low carbon is an economic model, a mechanism of operation and a way of life for citizens. The key is to prevent and control pollution, monitor pollution indicators and report impact factors, and make environmental quality reports. The prevention and control equipment should be updated and maintained at any time. Human resource management ensures that the right talents are employed in the right positions to ensure the continuous and effective operation of the power chain in the whole process of environmental protection and low-carbon work. The 5P model is the theoretical basis for all this.

## 7. Literature Review

Zhang Hongyu (2018) put forward the strategic significance of rural revitalization in the literature. The vigorous development of rural areas is of great significance to the smooth progress of China's environmental protection and low-carbon work. If the environmental quality of rural areas is greatly improved, the low-carbon economy will come one day earlier.

Guo Wenjuan (2019) discussed the advantages of rural human resource management and the existing problems in the literature, and analyzed a series of work that should be done in accordance with rural human resource management.

Zhu Lirong (2018) discussed all aspects of rural human resource management in the literature, and gave her own unique opinions on the current situation and what should be done next.

Xu Shanshan (2020) pointed out the restrictive factors of human resources in the process of environmental protection and low carbon in the literature, and put forward countermeasures.

Li Xiangguang (2018) points out in the literature that practical skills are the most important. In order to realize low-carbon economy, it is necessary to vigorously forge various skilled talents in rural areas to provide technical support for environmental protection and low-carbon.

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