THE PRESENT SITUATION, TYPES AND CHANGES OF CHINA'S ENVIRONMENT

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ABSTRACT: Based on development level of regional society and economy, the paper attempts to analyze the present situation, types and change of regional environment in China through the definition of four conceptions environmental pollution index (EPI), social and economic comprehensive index (SECI), environmental comprehensive index (ECI) and social, economic and environmental comprehensive index (SEECI) and some mathematical calculation, and draws some conclusions to be worth referring: 1) There exists close relation between economic development and environmental situation. With high-speed development of economy, the discharge of the three wastes in China has been increasing, but its environmental social and economic benefit has also been improved at the same time. 2) In the course of economic development, regional environment situation in China has continuously been changing, and there exists the difference of environmental quality between provinces, which is bigger than that of economic development level between them. 3) Except very few provinces, regional EPI in China has risen in varying degrees since the 1980s, which shows that the task for China to prevent environment from polluting is still arduous.

KEY WORDS: regional environment, present situation of environment, environmental types, environmental change

1 INTRODUCTION

Essentially, environmental problem is an economic problem. At present, various environmental problems which man are being confronted is a direct and indirect man-effected result. Meanwhile, environmental problems are closely related to social problems, especially rapid growth of population (Qu, 1994). So, when environmental problems for one region are analyzed, it is necessary to consider its social and economic development level.

2 THEORY AND METHOD

2.1 Several Basic Conceptions

2.1.1 Environmental comprehensive index (ECI)

ECI expresses the change of total environmental pollution in one region for a period, the value of which is the sum of normalized quantities of the three wastes (waste gas, waste water and industrial residue) and be calculated by equation (1).
where $X'_i$ represents normalized value, $X_i$ represents original data, and $\bar{X}$ represents the average of the date.

### 2.1.2 Social and economic comprehensive index (SECI)

SECI expresses total produced material wealth and population load in one region for a period, the value of which is the sum of normalized total population ($R_K$) and gross domestic product ($GDP$) and be calculated by equation (1).

### 2.1.3 Social, economic and environmental comprehensive index (SEECI)

SEECI is used to express the comparison of ECI and SECI, the value of which is calculated by equation (2). The smaller SEECI for one region, the better its environmental effect when economy and society are developed; Otherwise the worse.

$$F = \frac{X_{fa} + X_{fb} + X_{fah}}{X_a + X_{alp}}$$

### 2.1.4 Environmental pollution index (EPI)

EPI expresses the extent of environmental pollution resulted from creation of GDP and some quantities of population in one region, the value of which is calculated by equation (3). Thinking about the difference of pollution extent resulted from waste gas, waste water and industrial residue, the method of weighted mean is used. Weight is calculated by equation (4).

$$P = \frac{1}{2} \left\{ FSH(R_{11} + R_{21}) + FQ(R_{12} + R_{22}) + FZH(R_{13} + R_{23}) \right\}$$

### 2.2 Study Method

The study is based on two prerequisites: 1) The discharge of the three waste decides environmental quality in one region; 2) The composition of $R_K$ and GDP represents social and economic development level in one region. In the light of above two prerequisites, environmental quality of one region will be analyzed and studied through calculating by equations (1), (2), (3) and (4).

### 3 THE COMPARISON OF ENVIRONMENTAL SITUATION BETWEEN CHINA’S VARIOUS REGIONS

The paper divided China into three types of region: (1) administrative division, includes 22 provinces, 5 autonomous regions and 3 municipalities(except Chongqing); (2) the three big zones, namely, eastern zone (including Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi and Hainan), central zone (including Heilongjiang, Jilin, Inner Mongolia, Shanxi, Henan, Hubei, Hunan, Anhui and Jiangxi) and western zone (including Xinjiang, Gansu, Qinghai, Ningxia, Shaanxi, Sichuan, Yunnan, Guizhou and Tibet); (3) seven areas, namely, Northeast, North China, Northwest, Central China, East China, South China and Southwest. On the base of analyzing their economic development level and population load, environmental situation of China’s various