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Urban environmental problems transition and environmental education towards sustainable cities in China

LI Wei, XUE Ji-yu

(State Key Joint Laboratory of Environmental Simulation and Pollution Control, Institute of Environmental Sciences, Beijing Normal University, Beijing 100875, China. E-mail: WEILJ@BNU.EDU.CN.CHINA)

Abstract: With the rapid economic development and the speeding up of urbanization, the urban environmental problems in China are experiencing a progressive transition, which is characterized by steady transferring to the living (or consumption) oriented pollution pattern from the production oriented pollution pattern. Regarding this transition, the environmental education recognized as an important measure for approaching the objective of sustainable development, should transfer its focus correspondingly in urban area, which is to transfer to the habit cultivating pattern on the basis of the traditional knowledge inputting environmental education pattern. In practice, the urban environmental education should emphasize more on developing or cultivating the sustainable living mode of the urban residents, especially the students in elementary and primary schools and women. By this transform, the environmental education may be guided further towards sustainable development, and to serve the achievement of sustainable cities better in China.

Key words: environmental education; sustainable cities; transition; transform

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1 Urbanization and transition of urban environmental problems

It is well known that China is now experiencing rapid urbanization and industrialization. So far, in 1997, there are 666 cities which is approximately triple the numbers in 1980, and about 380 million people are inhabited in these cities in China (China Science & Technology Committee, 1998). Furthermore, by the estimation, the numbers of cities will reach 800 in 2000 (China Science & Technology Committee, 1998) and more and more people will be living in the urban areas.

On the other hand, apart from the population growth in cities, with the development of urban economy and income growth of urban residents, the urban environmental problems have been varied. Typically, the traditional industrial production-oriented urban environmental problems, which are also called “four-big-pollution” such as air pollution, water pollution, solid waste pollution and noise, are both being paid much attention and acquiring effective treatment and control, or forced to move outside cities. Meanwhile, some relatively newly emerged urban environmental problems have come or are coming into people’s concern, which are closely related with the urban life or consumption, such as automobile pollution, in door air pollution, “white

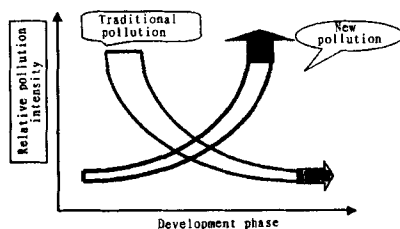


Fig. 1 Transition of urban environmental problems

pollution” and urban litters which all may also be called living-pattern urban environmental problems. Such transition of urban environmental problems may be well illustrated by Fig.1 or the Shanghai case (China State Statistical Bureau, 1997). In 1997, for example, the total discharge of waste water is 2.11 billion tons in Shanghai, in which the industrial discharge accounts for 47.34%, while the domestic discharge is 1.11 billion tons accounting for 52.65%. These statistic data indicate that Shanghai has entered into the transition period of

environmental pollution additionally with other observed evidence.

1.1 Automobile pollution

Promoted by the national development policy of automobile industry, the urban automobile ownership, especially the private cars, has been growing sharply, which has heavily aggravated the urban air pollution and traffic noise. For example, the annual growth rate of autos is 16.4% from 1980 to 1996 in Beijing, and the current registered autos are 1.2 million, which ranks first among the cities in China (China Environment Press, 1998). In the summer of 1986, the sign of photochemical smog was found initially in Beijing, and in 1993, the concentration of NO_x exceeded that of SO_2 (China Environment Press, 1998), which indicated that the auto emission had become one main source of urban air pollution. At present, the air pollution of Beijing is characterized by coal burning and auto emission. In addition, the leaded fuel is limited or prohibited for using in many cities in China such as Beijing, Shanghai, Guangzhou and so on.

1.2 Indoor air pollution

In recent years, the decoration and redecoration of living rooms and offices is very hot in many cities. During this process, a large amount of materials containing hazardous or toxic chemicals for human health have been used to make rooms or offices comfortable or good-looking (Beijing Daily Newspaper Office, 1997). However, it has been proven by some related monitoring and tests that, the indoor air of such rooms is three or four times more hazardous than the outdoor air, which may become further serious in winter.

1.3 White pollution

The so-called "white pollution" refers to the solid waste pollution brought by a large amount of use of the white plastic bags and polystyrene fast food lunch-box, in which the daily abandoned amount of the latter is about 2 million in Beijing (Beijing Daily Newspaper Office, 1997). Besides these white products may damage the urban appearance and the soil as they are very difficult to be degraded in natural environment, it has been found that there is a certain amount of polyethylene monomer residue in such kind of products, which is harmful for human health.

However, by the result of environmental awareness survey carried out on the Environmental Day of 1997, for white pollution, the people who agrees on the "forbidding use" accounts for 27.63% the total, and who supports the "restrained use" constitutes 15.8%, while 56.57% the total favors the "recycle and reuse" (Beijing Daily Newspaper Office, 1997). This survey result not only demonstrates that the current policy is appropriate for solving the white pollution, which is to make such white products reduce, turn into resource and become harmless, but also is closely related to the environmental education and information publicity on white pollution promoted by Beijing government.

1.4 Urban litter

With the increase of urban population and the improvement of urban living standard, the urban litters have been progressively increased by the speed of 8% to 10% each year. So far, the production of urban litters has reached 100 million tones per year, and the daily litter production per capita exceeds 1kg in urban area, which is close to the average level of the developed countries (Xu, 1996). However, by the result of the above-mentioned survey for the classified collection of living litters, the rate of favoring this measure highly reached 98.18% the total, even though among which one third thinks that the current conditions are not sufficient for enforcing this measure (China Environment Press, 1997).

2 Urban sustainability in China

Seen from the static angle, the urban environmental states in China do not meet the requirement of sustainable development. However, if observed in the dynamic view, the Chinese

cities represent stable and improving trend and potential, and are characterized by some certain degree of dynamic sustainability. Further, if the Chinese environmental protection actions are put into consideration, then it may be seen that systematic environmental construction and management has been recommenced to go towards sustainable development of cities. Although these efforts are not sufficient in the light of the pressure of economy and population growth, there still are strong reasons for maintaining confidence in the prospect of sustainable cities in China. That is because that the Chinese cities are in a special position or phase which may be taken advantage of to quickly guide Chinese cities into the track of sustainable development. Specifically, the Chinese cities are not like, both some cities in the developing world which are beset by the prevailing serious poverty, and the cities in developed countries which have already got particularly used to the unforgettable living mode of high-consumption. They could be directly guided or built by great efforts on the current basis into sustainable cities, of which the mode of survival and development is characterized by high quality and sustainability. Now, it can be said that at least some of the Chinese cities are in transition period.

3 Environmental education towards sustainable cities

It has been broadly recognized that environmental education plays an important role in promoting sustainable development. Undoubtedly, it is also a powerful tool for achieving sustainable cities, during which the effect of environmental education on creating a beneficial climate and knowledge basis for reaching sustainable cities may partly be illustrated by the above-mentioned environmental awareness survey of citizens in Beijing.

Obviously, by the above introduction and analysis, in some Chinese cities, especially some metropolis, the urban environmental problems are in or approaching the period of transition, which is characterized by steady transferring to the living (or consumption) oriented pollution from the production oriented pollution. Facing this new situation, and especially in order to ensure and guide these cities in transition into the sustainable road, environmental education should be upgraded to a correspondent high position, and the traditional environmental education has to suffer from fundamental transform by the requirement of sustainable cities. In practice, environmental education should transfer to habit cultivating pattern on the basis of the traditional knowledge inputting pattern, which will emphasize more on developing or cultivating the sustainable living ways of urban residents, especially of the students, women, decision-makers, young men as well as NGOs. This transformed modern environmental education towards sustainable cities may be composed of three basic aspects of the environmental education for sustainable cities, the environmental education about sustainable cities and the environmental education in building sustainable cities (Fig.2). Most of importance, such environmental education should take developing or cultivating the sustainable living habits of urban residents as its central principle or target, and try to achieve the following three objectives, which are respectively related with the above-mentioned three aspects of environmental education towards sustainable cities.

3.1 Knowledge objective

Understand interrelationships among environmental aspects; understand the environment, economy, society and culture, and their interaction at temporal and spatial scales.

3.2 Skill objective

Skill of communication, which involves; explains the views and thoughts about environment; discusses an environmental problem; cooperates with others.

Skill of handling information, which are; collecting information; designing and simulating a survey activity by information technique; organizing and planning an investigation project; analyzing and appraising the collected information.

Attitude objective: be responsible on environment; respect others; accept rational evidence and argument; be of tolerant attitude and open mind.

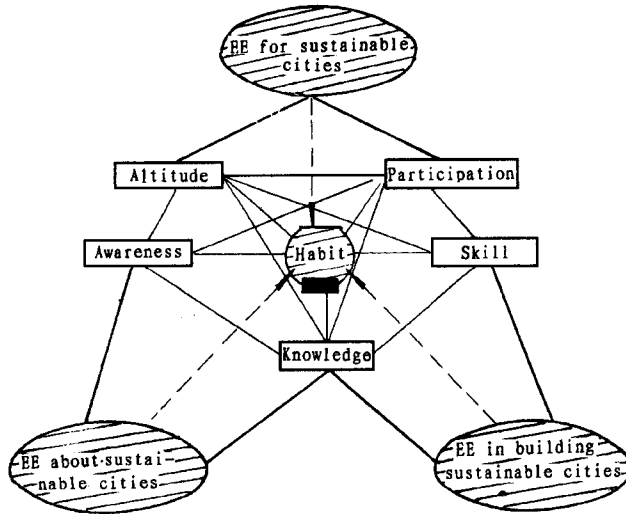


Fig.2 Aspects of environmental education towards sustainable cities

4 Conclusion

As in most developing countries like China, many cities are experiencing dramatic development in many aspects, among which urban environmental problems in these cities are being varied with rapid urbanization, economic development and population growth. Regarding the transition of urban environmental problems, environmental education has to be transformed correspondingly so that it may become a powerful tool for reaching sustainable cities, and to help and guide these cities in transition to achieve sustainable development by promoting their (cities or citizens) decision-making, behavior and capacity. From the view of author, the transformed environmental education in China towards sustainable cities should take developing or cultivating the sustainable living habits of urban residents as its central principle or target. And in practice, it may contain and develop three aspects, which are the environmental education for sustainable cities, the environmental education about sustainable cities and the environmental education in building sustainable cities.

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