

## The Path of Constructing the Localization of Environmental Ethics in China

ZHANG Xingping<sup>[a],\*</sup>; SUN Daojin<sup>[b]\*</sup>

<sup>[a]</sup>Postgraduate, School of Political Science and Public Administration, Southwest University, Chongqing, China.

<sup>[b]</sup>Professor, Center for Studies of Economic and Social Development, Southwest University, Chongqing, China.

\*Corresponding author.

**Supported by** the National Social Science Fund: Research on the Construction and Innovation of Marxist Ecological Philosophy System (No.12BZX026); the Fundamental Research Funds for the Central Universities: Research on the Way to Localization of the Western Environmental Ethics (No.SWU1409233 & No.SWU1409235).

Received 14 February 2014; accepted 15 May 2014  
Published online 25 May 2014

### Abstract

Environmental ethics have the dual nature of moral philosophy and applied ethics, therefore, it can be with the cornerstone of metaphysical paradigms, but also attached the importance to the goal orientation for the practical efficiency. As a cultural and historical category, environmental ethics internally define “regional” and non-universal ethical theory as its core. In addition, thought of parting between subject and object reinforced the antagonistic relations between human beings and nature in traditional western philosophy. Thus, the above two aspects lead to environmental ethics development predicament of theory and reality in China. Therefore, in order to solve the problem of modern China’s severe environment and get rid of the survival crisis, environmental ethics should create paradigm on the ontology, sublet integrative thinking in Chinese ancient philosophy in terms of epistemology, take the way to sanitize Marxist Philosophy on the methodology as lessons. Finally we will realize the localization of Chinese environmental ethics in the future.

**Key words:** Environmental ethics; Localization; Dilemma; Practical path

Zhang, X. P., & Sun, D. J. (2014). The Path of Constructing the Localization of Environmental Ethics in China. *Studies in Sociology of Science*, 5(2), 83-88. Available from: URL: <http://www.cscanada.net/index.php/sss/article/view/4765> DOI: <http://dx.doi.org/10.3968/4765>

### INTRODUCTION

Environmental ethics is born of increasingly serious ecological crisis in western countries since the industrial revolution, it has experienced the following three phases: the “survival theory” stage, the “sustainable development theory” stage and the “ecological modernization theory” stage. Hence as far as these English-speaking countries, especially in the United States and Europe, research paradigm and theoretical results of environmental ethics come from its cultural background, so there is no localization problem. However, western environmental ethics was confronted with the localization problem at the outset in the 1970s for non-western countries—weather anthropocentrism, non-anthropocentrism or wilderness of deep ecology theory applied to non-western countries, non-western countries including China how to build the localization of environmental ethics, the environmental ethics theory formed in the reality of the west how to turn to regional, specific environmental protection practice, and so on. The profound reflection and effective resolution of series of problems will be not only beneficial to perfect China’s environmental ethics system, but provide theory support for the “strive to build a beautiful China” and methodological guidance for the construction of ecological civilization. Overall, it is clear that the research on problem of western environmental ethics localization has become the hot topic or focus in academic.

## 1. THE LOGICAL PREMISE FOR A PURSUIT OF THE LOCALIZATION OF ENVIRONMENTAL ETHICS

With the development of environmental ethics since the 80s of the 20<sup>th</sup> century in China, it has gone through a long period of media-translatology phase at abroad, but that does not obscure the fact that environmental ethics inherently appeal to localization. Moreover the study of localization is the theoretical base of environmental ethics's construction, as Archimedes' ambitions: "Give me a fulcrum, and I shall move the world".

### 1.1 Ethical Category Definition: There Is No Universal Ethical Paradigm

As a branch of philosophy (including environmental ethics), ethics is a historical and cultural concept in nature the same as philosophy, and agrees with the 'ought-to-be character' (value-judgment) rather than the 'actual character' (fact-judgment). The word 'culture' from the Latin word 'Cultura', means land plough and plant cultivation, and later was put forward as the physical and mental cultivation. In a broader sense, it refers to both material and spiritual wealth created by human beings during the developing process of the society and history (Feng, Yin, Zhu, *et al.*, 2007). In other words, culture conception or idea roots in certain time's reality, such as social morals, and is profoundly influenced by the social material production and from the corresponding to the material culture and spiritual culture. It can thus be seen, ethics rooted in the culture must be consistent with the certain folk culture in a given time, shares the features of epochal, national and regional.

Science aims at reading nature, seeking truth and pursuing justified knowledge, and is a knowledge system reflecting the objective world (including nature, society and thinking) and its pattern of movement. Moreover, it embraces the character of objectivity, truth and systematization, so then science is a knowledge system of truth. With the advent of big science, different professional fields lead to further specialization, boundaries of discipline are more and more fuzzy (such as complex modern science, self-organization theories, chaos, etc.), and the renewal cycle of knowledge and technology is more and more short. Science provides a broader vision for knowing and changing the objective world as a kind of social organizational system, besides it offers a world view which is the highest real and good and an objective trend independent of man's will. Science as well as ethics is full of wisdom, but the former characterized by stereotyped and 'gray' become colorful because of the latter's flexible supplement (Wittgenstein). Seen from the ethical concept level, ethics belongs to the cultural and historical category instead of scientific category. In the beginning with "local" as its core, there is no "general ethics" which can go beyond nationality,

geographical space and time. That is to say, different nations have distinct cultures and different concepts, also have different values, beliefs, and moral norms (Liu, 2011). Similarly, to cope with the ecological crisis and avoid the environmental risk of science and technology, the so-called "environmental ethics" was put forward. Nevertheless, it is just the western environmental ethics from western background. So it must not provide practice guidance based on a unity of universal environmental ethics for other regions or countries, meanwhile, it cannot deny or negative environmental ethics which lies in other excellent cultural traditions including China. Otherwise, we will be steeped in a cultural hegemonistic quagmire deeply and hard to extricate ourselves.

### 1.2 The Theoretical Flaw of Environmental Ethics: Practice Turn to the Deconstruction of Subject-Object Dichotomy of Thinking

Environmental ethics is also called "ecological ethics" or "land ethics", just as its name implies, it has the applied ethics' nature that the "ecological or moral ethics" is its research object, is the certain theoretical system of moral concept, standard and evaluation how human treats nature. It pays attention to this problem for which attitude man should take a variety of life on the earth closely related to their own survival and development (Zhu, 2001). At the beginning of Western Ethics development, as to the value of man and nature, there have been existing two types of controversies in this issue: Anthropocentrism and non-anthropocentrism. In practical terms, different schools give different answers: "the theory of animal liberate" of Peter Singer and Tom Regan, Biocentrism of Paul Taylor, Ecocentrism of Holmes Rolston and Ecoaesthetics of Eugene C. Hargrove. However, the rationality of environmental ethics has always been based on the confirmation of this problem about "whether nature has intrinsic value", and "whether the natural protection is the same as handle interpersonal relationships". So on the one hand its prerequisite is that nature as the objective existence is independent of man's consciousness; on the other hand, it is that man as a rational subject is possible to recognize the inherent value of nature. Such logic premise suggest that the research clue of environmental ethics is setting up a significant benchmark to measure the essence of nature as Kant proposed the announcement—"Human Legislates for Nature". Human being (Subject) not only go outside the nature (object) to become a man, but also become the "God" to control the nature as its opposite. So nature has generally become a dissident power beyond human, and the essence of natural humanization and man's objectification is to verify the intrinsic value of mankind. This is because subjective philosophy (voluntaristic philosophy) from modern rationalism and the thinking mode of subject-object dichotomy block the ethical pathway and conversation between man and nature. As a result, we must surmount the thinking of modern western

philosophy and traditional ethics framework; meanwhile, we should make the establishment of the ethical relationship between man and nature come true to lay the foundation of the same original life (Liu, 2008). Due to advocacy for rationalism, scientism and utilitarianism of the subjective philosophy as its theoretical foundation, it is ironic that the western environmental ethics was trapped in the cycle of anthropocentrism during the process of anthropocentrism to non-anthropocentrism.

With the development of the Green movement across the world, environmental ethics appeared some new changes under the influence of postmodernism—the biology-centric deep ecological theory, the social ecology combined the environmental and social problems, ecofeminism devoted to the emancipation of women. As everyone knows, environmental ethics have the dual nature of moral philosophy and applied ethics, and the latter shall possess a distinctive or most important feature of practicality. Thereout these experts reach a consensus: Value of environmental ethics is to promote human environmental protection enterprise from real life. To be specific, environmental ethics is oriented on practice—as the object of practice, nature ought to be the specific and local nature rather than the existence of a wholly abstract universality; As the carrier and existing precondition, man must be the realistic and specific person rather than just the existence of rational and abstract notions. Every environmental protection practice of the real-life is all the course of interaction of the human being with individual consciousness and environment in the special context of time and space. In a way, the practice turn of environmental ethics is the deconstruction of subject-object dichotomy of thinking. Meanwhile, it shows that the research on ethics should center on “local” (not only referring to the geographical location, but also more emphasis on the geographical location of cultural elements—the author note) (Gao, 2012). Hence, China should have local environmental ethics which is different from the west while that fits China’s national conditions. Constructing the localization of Chinese environmental ethics is the necessary way to realize its practical effectiveness, to say the least. As Hargrove said: “Only as environmental ethics progress in its slow pace of the borrowing of culture, the single, universal and international ethical theory will eventually possible appear” (Hargrove, 2012).

---

## 2. THE PREDICAMENT OF CHINESE ENVIRONMENTAL ETHICS

---

China has been faced with a key turning point of chance and challenge since the foundation of the state: To put the most economic development and ignore the limits of nature resources and environments or to limit the

economic growth in a reasonable range to get over of the environmental crisis? In recent years, environmental pollution has more and more serious trend, and even has caused the psychological panic of the public. For example, every region in the country is being exposed to varying levels of a pollution haze, a great deal of dead pigs swam with the Huangpu River and disappeared (Mo, 2006), rice was polluted by heavy metal cadmium and so on, these contamination accidents were really shocking. Because human existence has already been threatened by increasingly polluted environment, people come to realize the danger of pollution and have joined in the environmental movement. So we can see some slogans like “to protect the environment, to save humanity” everywhere. The environmental ethics emerged at a historic moment under the world-wide environmental crises; however, it suffered many difficulties, like the discrepancy of theory and practice, the lack of innovation and chaotic paradigm.

### 2.1 The Separation Between Theory and Practice

Environmental ethics inherently has the dual nature of moral rationality and practical rationality, they two complement each other, and not a single one can be omitted. Its practice feature requires environmental ethics is not just a broad concept but research from our real environmental problems. What’s more, it should turn the theory to the nature and change the external ethical norms into an initiative and conscious behavioral habit. According to the inspirit of “The Eighteen Member’s Congress of CPC”, the construction of ecology civilization occupies an important place in the overall arrangements for the cause of socialism with Chinese, and the practical orientation is significant for the construction of “Beautiful China” and the harmonious society. Nevertheless, environmental ethics in China have been committed to the legitimacy, subjective nature, object and method and the relationship among environmental law, aesthetics, development ethics and environmental ethics during the past more than 30 years. Thus this series of problems which need consideration lead to the lack of environment moral practice research and question consciousness, that is to say, the root cause for such contradictions is the isolation between theory and practice. Take “The Three Gorges Project” for example, the large-scale hydraulic project involved many areas of Chongqing and Hubei provinces has the impact on the surrounding ecological big far exceed expectations, such as the decreasing biology diversity, the increasing geological disasters (like earthquakes, landslides), climate abnormal change (like drought, “random pattern” of the four seasons, submerged cultural relics and historic sites). And this precisely because of the previous argument was too simple and rough, but not gave full play to the environmental ethics theory guidance and practical effectiveness.

## 2.2 The Lack of Paradigm With Chinese Characters and the Confusion About Introduction and Creation

Compared with the western, due to the late development of environmental law in China, till now, it has not been formed as a particular discipline system. But from a different perspective, it is not only necessary but very urgent to introduce and update the academic frontiers of the western environmental ethics to instruct the construction of environmental ethics in China. At the same time, domestic scholars have long-term attached great importance to the introduction but neglected self-production and creation, this manner made environmental ethics loss its internal impetus, as well as, it's difficult to form a perfect research paradigm (including definition of related concepts and theoretical objectives, joint commitment and mission, the consensus of research methods and principles) and a relatively complete system of disciplines. From the domestic authority of popular science books and journal articles published, we can make out: The discourses of anthropocentrism, animal rights theory, biocentrism, ecocentrism, deep ecology are common, and most studies and development mainly focus on resource sharing, but in fact, these schools of thought are not endogenous theoretical achievement of Chinese environmental ethics, but the reprocessing and reinterpretation on these theories and thinking. Therefore, the ethics is not only short of its original creativity and theoretical depth, but also it has the noticeable fine marks (Li, 2012). The prosperity of Chinese environmental ethics depends on the creation of the Chinese environment ethics school, and the formation of Chinese environment ethics school relies on criticizing and surmounting the Western traditional ethics. Thus, it is important to build the theoretical paradigm with Chinese characteristics and style, otherwise, the localization of environmental ethics is like water without a source, or a tree without the root.

## 2.3 Support and Independence: Dependence-Producing Property of the "Hot Upper" (Government) and the "Cold Lower" (the People)

The first step is to identify what the dependence-producing property is—environmental protection movement in China always shows this feature "the hot upper and the cold lower". Namely, the public's enthusiasm for the contribution to the environmental protection is not high and takes the negative act while they count on the authorities to take strong action to protect the environment. Actually, the people are not even clear their own responsibility and obligation, and the public participation is generally low. When it comes to such dilemma of environmental ethics in China, there are two reasons: for one thing, "it seems to be the intermediate state: too much concern on application to meet the requirements of the traditional theoretical philosophers; too abstract to be used for the problem of

environmental policy and solution as well" in terms of the ethical discipline. There is a formidable "generation gap" between the theory and practice in some degree. For another, most study is "top-down" and driven by external forces from the officials, but lacking in the wide "bottom-up" participation from non-governmental forces for the current social realities. China's environmental ethics research mainly stays on self-interest and academic discussion, and the funds which support the related study are most from government or individual, instead of very little from the folks or enterprises. Therefore, it's hard to avoid the too highbrow development predicament; the populace's passion is also difficult to be mobilized for the focus on environmental issues and practice. Developing economy at the expense of the environment and the "stupid experiment" like missing the forest for the trees has been all falsified by the irony of the fact that China is faced with more and more severe pollution problems. The ecological consciousness of the masses has also been gradually strengthened, and environmental protection has been mentioned the height of the social development, and to avoid the phenomenon of environmental responsibility must be improved.

Above all, the localization of western environmental ethics is to avoid environmental crisis and it is the good antidotes to solve the pollution and get rid of the survival crisis. When the western environmental ethics and the Chinese society (comprehensive factors including politics, economy and culture) fit in time and space, the dominant or recessive rejection of the division of theory and practice, paradigm of chaos and the public's opposite attitude precisely provides the sufficient reason to realize the localization of environmental ethics.

## 3. THREE DIMENSIONS OF BUILDING THE CHINESE ENVIRONMENTAL ETHIC

Based on the above analysis, why the foreign developed a kind of radical environmental ethics is that it rooted in the specific living environment and its liberal tradition. Reflecting the reality in China: The vast land has a large population, pay attention to etiquette order of the Confucian cultural tradition ... Now then, radical environmental ethics has the growing suitable soil deficiency in China, and it is just short-lived like a flash in the pan even after unremitting efforts and successful "grafting". Therefore, the environmental ethics we need to construct, should be and must be accord with China's national conditions, be fused in native culture and has a distinctive style of ethics. So-called "the localization of environmental ethics" refers that the serious situation of ecological environment forms its reality foundation; the ancient conception of unity between man and nature is its core; to build the sustainable environmental ethics with Chinese characteristics is on the basis of criticizing and



learning from outstanding ecological ethics thought at all times and in all countries involved (Liu, 2011). Namely, the construction of Chinese environmental ethics is both based on “local knowledge” and compatible with “general knowledge”, it also pay attention to theoretical value and practical efficiency, and to realize the harmonious coexistence between man and nature and regard aesthetical habitat (Heidegger) as own duty.

### **3.1 The Ontological Dimension of Chinese Environment Ethics System**

As the theoretical foundation and development power, to create Chinese environmental ethical system means that the innovation of theoretical paradigm should be encouraged. “Paradigm” representation is conceptual category with a rich connotation; on the whole, it is a framework of understanding; and contains scientific theory achievements, methods and beliefs of the scientific communities. Behind the prosperity of Chinese environmental ethics, there are problems—its endogenous theoretical basis is weak, lack of inner development power and the methodology principle of the unity. So it appears to be particularly urgent and necessary to create theory paradigm of environmental ethics in China. First of all, Chinese environmental ethics should proceed from the broad perspective of compound ecosystem which is made up of “nature-society-spirit” to realize the unity of the environmental ethics about the nature, society and spirit (Yu, 2010). Western environmental ethics focus more on the relationship between human and nature, but less on the relationship among people, and between man and himself. As is known to all, the relationship between human and nature in essence inherently contains the interpersonal competition, the resource allocation, and getting along well with its nature. Therefore, it suggests that the combination of these relationships including person, society and nature are beneficial to the development of Chinese environmental ethics. Secondly, the Chinese environmental ethics should be the integration and transcendent of the western schools, and develop towards the open unified direction. Due to the impacts of modernization and globalization, China is in a superposition of multiple social transition periods, and in the transition of political multi-polarization, economic globalization, information-based society, cultural diversity. To some extent, the experts and scholars or the general public feel value confusion, difficult choice and so on. Thus, Chinese environmental ethics can’t just mimic the western and follow the same old disastrous road, or it is difficult to form a unified theoretical perfect system and the scientific community.

### **3.2 The Epistemological Dimension of Facing East Ecological Wisdom**

Environmental issues are comprehensive social problems, which require comprehensive means to deal with. Thought

lead to behavior, concept determine action, thus localized environmental ethics must first solve the problem of the concept. And we know that formation of ideas rooted in the fertile soil of the national culture, China environmental ethics goes affected by the ancient Chinese philosophy, and it is malleable. In fact, the Chinese philosophy contains a wealth of ecological ethics wisdom, just as the ancient Greek philosophy materialist ideology, is immature, unfinished, wisdom fire fragmented ecological ethics which needs to be further dig and sort. Confucian philosophy focuses on social human relations of “do unto others, not do to others” and “social commitment”; Taoist philosophy concerns the relationship between the nature and human of “the natural inactivity”, “Dao follows nature” and “comply with nature”; Buddhist philosophy emphasizes the spiritual realm accomplishment of “habitat by the heart”. Although the three factions have different emphases, the ideological content provides a rich theoretical resources for the turn of the west to the east: The holistic and organic thinking is throughout on epistemology to avoid the subject-object dichotomy of thinking which would lead to the confrontation and separation between man and nature. To re-examine and learn from the wisdom of the ancient Chinese philosophy of ecological “nature and man as one”, and to return the holistic thinking that it always takes the connection and development among things into consideration is the reflection and integration of traditional culture. It is the necessary way to realize fusion of Chinese traditional culture, the western environmental ethics (especially deep ecology) and modern environmental problems.

### **3.3 The Methodology Dimension of Marxism in China**

With the western powers gunboats, Chinese history was forced into the development process of world civilization. In this period of the contention and debate between Chinese and Western civilization, early Marxist, such as Chen Duxiu, Li Dazhao, Mao Zedong, opened up a historical road of Marxism in China with the dialectical attitude of “select the essence and discard the dross” (*Lu Xun*). You can say that Marxism as an ideology and social movement has been deeply embedded in China’s modern history. We have experienced the reforming and opening up from 1978, the establishment of nation science 1949 and more and more powerful country in the past century with the theoretical guidance of Marxism. Chinese Marxism way is to use Marxism to solve practical problems of the China’s revolution, construction and reform; to enhance the basic experiences in the revolution and construction to the related theory; to make Marxism root in the excellent Chinese culture; to enrich Marxism in practice (The Editorial Committee, 2010). The localized environmental ethics with both the value of metaphysical theory and physical practice, created the Chinese Environmental Ethics School which is based on transplantation and imitating of Western Environmental

Ethics, and combined the reality of ecological environment with the cultural traditions. In this sense, the way to localization of Chinese environmental ethics and the path of Marxism in China both focus on practice direction: seeking truth from facts, all proceeding from the actual situation and linking theory with practice, we should make a combination of Chinese practice, history and culture, make the abstract environmental ethics specific and lifelization as well. More and more folk force and social individual could join in the environmental movement by the massively popular and lovingly means of public service ads, ecological education and tours which providing fundamental methodological support and guidance for the construction of Chinese ecological civilization. It is noteworthy that Marxism in China's development path contains both a rational factors and irrational factors simultaneously; we should be dialectical to learn the beneficial ingredients so that it can provide a reference for the localization of environmental ethics.

## CONCLUSION

The survival and development is the eternal theme of human society, however, when human regard science and technology as the cutting edge, but hold highly the distinctive banner of surging "natural conquer" leaving the "reverence for nature" concept behind their heads, we find God's retreat begun to break human beings ecological balance of the material and the spiritual world. The wanton plunder of nature which gives birth to human ultimately lead to the ecological crisis: endangered species, the scarcity of non-renewable resources, the broken food chain, the global warming and so on. Environmental issues are not a country or a nation's duty any longer but the global crisis. That means it is regardless of countries and regions, nationality, even you and me. China is not an exception as well. Environmental ethics which is rooted in Western soil, has the certain theoretical reference as to solve environmental reality of Chinese society, but it cannot be regarded as a "universal ethics", which was performed copied or imitated. Because China's reality, like politics, economy, culture and other aspects, is different from European and American countries, the construction of Chinese environmental ethics is absolutely different from others. Therefore, in order to eliminate the people's "psychological fear of environmental pollution" and get rid of China's ecological crisis quickly, China Environmental ethics is bound to be required for localization construction. It can provide the reasonable logical premise for environmental ethics localization that environmental ethics has its own disciplinary feature and development difficulties caused by the subject-object dichotomy of thinking. When it comes to the "Chinese context", there are many problems, such as, the separation between theory and practice, lack of innovation, and low public participation. These problems make the construction of Chinese ethics particularly urgent

and important. In this, I have no intention to belittle the theoretical value and practical significance of the Western Environmental Ethics, just based on the experience of reality and doctrinal analysis, we should indicate the direction to the path to achieve China Environmental Ethics with integration and beyond the Western and characterized by inclusive Chinese style. In other words, Chinese environmental ethics must make "local" as the practical situation, aim at the localized construction, and have three thinking dimensions of the ontology, epistemology and methodology. Of course, the process of creating Chinese environmental ethics faction is impossible to overnight, and forming a community of environmental ethics is not transition-frogging also. It needs the support of government policies, accumulation of social and cultural soil and the concerted effort within the academic. Thankfully, with the help of more than 30 years' accumulations and development of Chinese domestic academic researches, ecological consciousness of the Chinese has been awakened, green environmental protection has become an important social development perspective. So we have enough reason to believe that China can solve its problems in development, assume their responsibilities and obligations, and deal with the relationship between man and nature, and eventually make the concept of "beautiful China" come true!

## REFERENCES

- Feng, Q., Yin, D. Y., Zhu, L. Y., et al. (2007). *Encyclopedia of philosophy*. Shanghai: Shanghai Dictionary Press.
- Gao, S. (2012). The Localization: the new direction of china's environmental ethics. *Philosophical Trends*, (08).
- Hargrove, (2012). Can and should there be a single, universal, international environmental ethics? *The ecological civilization: International vision and China's action--the 2nd Chinese International Seminar on Environmental Ethics and the Proceedings of Annual Meeting of China Environmental Ethical Philosophy*.
- Li, P. C. (2012). On the goal orientation for the construction of the localization of chinese environmental ethics. *Journal of China University of Geosciences (Social Sciences Edition)*, 12 (4).
- Liu, F. S. (2011). Chinese should have their own ecological ethics. *Journal of Social Science of Jilin University*, (06).
- Liu, F. S. (2008). The dilemma and outlet of ecological ethics. *Journal of Beijing Normal University (Social Science Edition)*, (03).
- Liu, F. S. (2011). Chinese people should have their own ecological ethics. *Journal of Social Science of Jilin University*, (6).
- Mo, Y. (2006). Life and death are wearing me out. Beijing: The Writers Press, quoting from this website. Retrieved from [http://culture.ifeng.com/whrd/detail\\_2013\\_03/26/23526016\\_0.shtml](http://culture.ifeng.com/whrd/detail_2013_03/26/23526016_0.shtml)
- The Editorial Committee. (2010). *Introduction to MAO Zedong thought and theoretical system of socialism with chinese characteristics* (pp.3-5). Beijing: Higher Education Press.
- Yu, M. C. (2010). How to construct the chinese environmental ethics school. *Journal of Greenery*, 10.
- Zhu, T. (2001). *Environmental ethics theory and practice* (pp.28-30). Beijing: China Environmental Science Press.