Ecology-based Forestry Sustainable Development in China

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Abstract: Since the industrial revolution, the world economy has dramatically developed at the cost of environment pollution, which caused a series of ecological problems. This thesis overviewed forestry sustainable development (FSD), reviewed the trend and nature of (FSD), discussed its ultimate goal, analyzed the forestry resources of China and the problems in China’s forestry sustainable development, and put forward some solutions.

Keywords: Ecology, sustainable development, forestry, solution, technological innovation

1 Introduction

Since the era of Adam Smith, economists have beheld a belief: higher economic growth rate always increases wealth accumulation, satisfies more human’s needs and enhances social welfare. Since the modern times, the pursuit of material wealth has created economic wonders and brought about unprecedented economic prosperity. However, more and more social problems have also been obvious, which does much harm to the development of human beings. (WANG Chunhe, 2007:10)

Environment and development is the mainly focused issue of the current international society. Sustainable development was first coined in 1967 by Michelle, an American economist. He believed that the pure pursuit of economic growth cannot bring about the increase of social welfare. Happiness pursued by human beings does not purely depend on fortune, but also on scenery, holidays and beautiful environments. Unfortunately, this ideal happiness has become the victim of GDP growth. (WANG Chunhe, 2007, 11) In 1972, The “Roman Club” released a report that the rapidly decreased resources from the 1970 will become the bottleneck for the rapid industrialization with the increase of population and human beings. On March 5, 1980, the United Nations Congress called on the whole world to study the relationship between nature, society and economy and ensure the sustainable development all over the world. In 1987, the Global Environment and Development Committee defined sustainable development in a report as “the ability to satisfy people’s current needs without sacrificing the needs of the future generation.” In 1994, the Chinese government made its strategic goal in “China’s 21 Century Agenda”. That is, to establish a strategic system of economic, social and resource and environment system which is sustainable. But how? One of the most practical and efficient way to realize the goal is the adoption of forest sustainable development.

2 Concept and Nature of Sustainable Development

Sustainable development refers to the harmonious development between economy, society and environmental protection. (LIU Xiangdong, 2009, 262; WANG Chunhe, 2007, 13; YU Changqing, 2009, 176) The nature of sustainable development lies in the balance between social, economic development and resource environment, focusing on the balance between economy and ecology. Sustainable development includes five aspects such as the sustainable development of economy, society, resources,
environment and the whole world. Sustainable development focuses on the steady development of economy without harming the environment and the change of our production method and lifestyle. (WANG Chunhe, 2007, 13) The survival of human beings is indispensable of the sustainable development of ecology. (YU Changqing, 2009, 176) The traditional model of production focuses only on the value of production without attaching any importance on the value of resource environment. It is a near-sighted development model and should be abandoned in the long run. Sustainable development has such six implications as the focus on development, fairness, sustainability, multifold goals, balance between environment and development, and the removal of traditional production and consumption models. (WANG Chunhe, 2007, 17-19)

3 An Overview of Forestry Sustainable Development

In the past decade, forestry sustainable management has got much support from politicians and caught unprecedented concern from scientists. (Franklin, 1995; Brand, 1997) FSD has become the world-wide common development model and has been regarded as the extension of sustainable development. (Ferguson, 1996) Forestry management policy has changed from the traditional model of “some specific wood products to the modern model of ‘multi-interest chains’. (Malla, 1997) Maini (1992,1-2) proposed the following definition of FSD: “Sustainable development of forest land and its multiple economic and environmental values involves maintaining indefinitely, without unacceptable impairment, the productive and renewal capacities as well as the species and ecological diversity of forest ecosystems". Salam, Noguchi, Koike (2005, 43-51) suggested establishing local technical capacity and managerial skills to ensure social, economic sustainability of land and natural resources.

Cirelli and Schmithüsen (http://www.fao.org/) reviewed the present situation of forestry legislation in Western European countries, examined important issues regulated in forest laws, discussed briefly the role of European Community legislation, and identified significant trends in recent laws addressing forest conservation and sustainable forest management. Farmer and Nsbe (2004, 279-285) overviewed changes in forest management in the UK with respect to environmental protection. The evolution of policy was explained from historical and sustainability perspectives and covers development in forest planning, accreditation, devolution and future challenges and opportunities.

Many Chinese scholars have also described FSD from the perspectives of economy, society and ecology. ZHANG Hujun & JIA Rong (2009, 205-206) believed that protecting and developing forest resource and improving ecological environment has become the main focus of forestry in China, and that forestry development needs to take into account the economic, social and ecological effects. HE Rongde (2009, 124-125) argued that forestry is the biggest producer in the global ecological circle, bearing social, economic and ecological functions and is closely related to social sustainability. WANG Jiuling (1986, 1-5) stated clearly that FSD is to satisfy the current needs of people without threatening future generations. ZHANG Binxin (2008,75-77) explored the macro and micro approaches to FSD. Forest is the natural environment bases for human’s survival and the material bases for human’s social activities. The environment of forest ecological system is indispensable to the development of society and economy. Forest is the biggest and most complete resource tank, gene tank, water reserve tank and energy tank. It is proved that forest has multiple ecological functions by keeping water resource, protecting the land and water from being damaged, keeping away from wind, stabilizing sand, adjusting climate, and nurturing species. Besides, forest has the function of preventing environmental pollution by keeping carbon and releasing oxygen, absorbing dust, decreasing harmful gases, resisting noises and beautifying environment. (LIU Xiangdong, 2009, 262) The enlargement of forest and the sound forest management system can effectively reduce the volume of carbon. Therefore, forest land plays a vital role in implementing low-carbon technology, saving energy, reducing emissions of carbon, and maintaining sustainable development.
4 The Evolution Background of Forest Sustainable Development in China

Since the founding of the People’s Republic of China, forest in China has experienced three stages. The first stage is the initial development stage (1949-1978), providing a lot of timber for the country’s industrialization. The second stage is the exploration stage (1978-1992), with its core business in stabilizing mountain and forest rights, dividing hilly land allotted for private family use, and establishing forest production responsibility system. The third stage begins from 1992. Influenced by the world environment conference and international forest trend, China has taken some reforms in forest, but it has not yielded an ideal effect. Destructively chopping down forest for the economic returns has been quite popular. Therefore, scientific management and sustainable development by integrating ecological effects and economic effect must be carried out. (YU Changqing, 2009, 176)

Economic globalization in the 21st century has made forestry in China faced with brand new tasks and more serious challenge, which has lots of effects on China’s sustainable development. Generally speaking, forestry resources in China are scarce, social demand for forest product is large, and the production process is immature, thus leading to the deterioration of ecological environment, lower forest productivity, insufficient capital, and backward technology. (WANG Jianbang, SHI Chunlian, 2009, 16-30)

5 The Countermeasure of Forest Sustainable Development in China

The forest natural resources, social and economic development, proposal of global low-carbon economy and the practice of integrating forest in China into economic globalization require that China must take the sustainable development. Therefore, it is essential to take measures to follow sustainable development in forestry.

5.1 Actively strengthen forest resource sustainable management

Forest sustainable management is an important premise for FSD. It covers various aspects of forest construction, e.g. in the scientific planning of forest development, forest land preservation planning, compiling forest management plan and strengthening forest monitoring system, etc. LI Nuyun, etc. (2010, 25) suggested measures should be taken by planting more trees and strengthening forest management to increase carbon sink, strengthening the protection of forest, forest land and wetland to control carbon emissions, exploring biomass energy to replace chemical fuels, and lengthening the use of woody forest products to solidify CO\textsubscript{2}. ZHANG Yaping (2009, 26) proposed strengthening legal system, fighting against the abuse of chopping trees, perfecting fire protection, insect and other natural disasters prevention, developing the chain of post-industry, and promoting ecological civilization.

5.2 Promote technology innovation, make more investment in forest

Science and technology is the No. 1 productivity. Technology innovation is the driving force of forest sustainable development. The key to solving FSD problem lies in the path of innovative economy to alter the traditional unscientific forest development model. Scientific and technological innovative system in forest is to be built by establishing enterprises as the main body, taking the market-oriented path, following technology as its core, and establishing economic returns as goal. (WANG Xin, 2009, 38-39) Besides, “digital forest” model is to be built, that is, to take advantage of modern information technology to promote the accuracy and scientific development of forest management. Technicians are to be encouraged to quicken the acceleration of technology transfer by the means of technology contract responsibility, technology transfer, technology service, joint development, and running economic entities, etc. It is also essential to speed up genetic improvement of forest and conal forestry technology, deepen forest intensive cultivation and management techniques, improve forest resource monitoring devices, and innovate wood processing technology. To be more specific, it is advisable to ensure the area ratio and quality of forest by cloning trees on the designated woodlands to improve the efficiency
of planting trees. (HE Yongde, 2009, 124-125)

Furthermore, more investment is also to be made in the basic forest research and practical technology research, R&D center is to be built, and the traditional labor-intensive processing model is to be altered to the technology-intensive processing model.

5.3 Strengthen forest law system
Forestry legislation in Western European countries is strict and well-regulated, most of which are multipurpose-oriented, including sustainable forest management, public participation, privately owned forest, government support to forestry, the integration of forest and relative activities of forest and the side effect of natural disaster such as forest fire, etc. In forest operation and management, China should learn from the advanced experience from the developed countries: setting environmental protection as priority. That is, priority is to be taken into consideration when it comes to conflicts between ecological interests and economic interests as well as other interests. Forest legislation should be strengthened to protect forest resources, properly utilize forest and maintain FSD. To be more specific, forest law system is to be enforced and perfected, forest governance by law to be implemented and to “maintain the steady utilization of forest”.

5.4 Promote forest sustainable development in China by internationalizing forest industry
Forest sustainable development depends not only on internal factors, but also on external factors. Therefore, we should strengthen international cooperation intensively, introduce elite seeds and advanced technology in forestry cultivation, forestry protection, forest product processing and forest product storage, etc. More important, we should actively cooperate with universities and research institutes of countries with advanced forest technology, introduce the advanced mental forest talents from abroad, and spare no efforts to train more forest talents to increase the international competition and scientific and technologic level of forestry. Meanwhile, we should also cooperate with those less developed countries which are rich of forest resources by providing them with capital, technology and talents, training local forest processing workers or technicians, and developing forest compensation trade and barter trade. Besides, we should also abide by international protocols and agreements, take on more international responsibilities. Although China has not been required to reduce its CO₂ emissions in “Kyoto Protocol”, we should voluntarily reduce our emission levels (as China ranks No 2 in the world as harmful gas emission producer). Finally, we should also engage in more carbon transactions at home, plant more trees abroad to increase more beneficial gases to replace harmful gases. (KONG Fanrong & LI Qinlin, 107)

6 Conclusion
At present, the persistent and high intensity carbon emissions have accelerated and will continue to accelerate the global warming, have a tremendous effect on the world production, human life and environment, and bring about unimaginable disaster to all countries. Stern, the British economist, holds that with the current development mode, climate change will decrease the world GWP by 5% to 10%. Confronted with this serious situation, developing low carbon economy and saving energy and reducing emissions are the inevitable choices to curb global warming. Therefore, the industrial structure should be adjusted, technology innovated, and the energy utilization efficiency improved by developing low carbon energy and reusable energy. More important, more and more countries have realized forest’s unique role in coping with global warming. Forest is the most feasible, less costly countermeasure to slow down climate change now and in the future decades. Forest helps counteract CO₂. Therefore, more forest land could be cultivated, more emphasis are to be laid on forest management, and forest resource should be maximized not only for this generation but also for the future generations.
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