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Case Report

A Special Mission Assessing How China's Unique Role in Shaping Asian Ecosystem since the Scend Half of the Last Century

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Introduction

Some recent studies have indicated that China has embarked on an unprecedented period of agricultural expansion, natural resource depletion, industrialization, economic reforms and urbanization since the 1950s [1-5]. Such movements driven by mercantilism have successfully upgraded China's economy, social structure and international status, particularly over the past more than 35 years. Unfortunately, this rapid and extended period of economic and social development, which relied principally on prevalent rent extraction of natural resources, has resulted in unprecedented impacts on China's environment, biodiversity, and human society. These include:

a) Increased air pollution, particularly the Northeast, that will undoubtedly the phenomenon for a long time to come [6].

b) Water contamination, about more than 200 million people in China are drinking unsafe water [7,8] and there have been 11,000 eminent water contamination related emergencies since 1995 [9].

c) Desertification now affects about one-quarter of China's total land surface across 18 provinces [10-12].

d) Extensive loss of biodiversity; among 673 of China's vertebrate species, 4.7% were categorized as critically endangered in 2004 [13] and at least 200 plant species have become extinct over the past 50 years and another 5,000 species are threatened or on the verge of extinction [14].

e) Unprecedented human health impacts-with an increased mortality due to cancers from 74.2/100,000 people in the 1970s to 108.3/100,000 in the 1990's to 135.9/100,000 people in 2004-2005.

f) Excessive depletion of natural resources including deforestation for agriculture and pasture land, the planting of monocultures (rubber, Oil palms, rice), and energy needs associated with increased urbanization [3,5].

g) Over-use of disposable material, for example, 28% of the plastic waste present in oceans worldwide are from China [4] and

h) Many of China's agricultural fields are contaminated due to the over application of fertilizers and pesticides, and heavy metal contamination [15,16]. Such ravaged ecosystem has dramatically generated negative impacts on China's economic development and humans, and resulted in China's increasing imports of food and non-food commodities [2]. Such negative impacts were also reported to have remarkably shaped Asian ecosystems and cause a great global attention, particularly those on its eastern neighbours, such as South Korea, Taiwan, Japan and Hong Kong and the U.S [17,18].

In order to understand how China's governmental policies and eco-social development have shaped Asian ecosystems, particularly that in its mainland, a research team including scientists from Australia, China and the USA are analysing four databases:

a) A World Bank data set containing 78 global environmental variables (records) from 48 countries and regions in Asia; 42 of them are studied and compared between China and non-China Asia in order to unveil the deteriorated Asian ecosystem profiles from 1960 to 2013, and detect show China is unique compared with its neighbours.

b) The Red List of China's vertebrates assessed in 2004 and 2015.

c) A World Health Organization data set containing records of 27 global cancer rates recorded between 1988 and 2007 and

d) A World Health Organization data set including a global profile of particulate matter in the air (PM10 and PM2.5) between 2013 and 2014, an indication of air quality.

The following questions are to be addressed:

i. Are there socio-economic development variables that negatively impact Asian ecosystems for which China's contributions are significantly greater than expected based on its size of land area relative to that of total Asian region?

ii. Are there socio-economic development variables that negatively impact Asian ecosystems for which China's contributions are significantly greater than expected based on the size of its human population relative to the total of Asian region?

iii. How has China's economic, social, and environmental development over the past 60 years impacted biodiversity, ecosystems and the health of its human population?

Our recent coming out preliminary results indicate that relative to its land size China has significantly contributed more than expected regarding 11 of the 42 variables shaping Asian ecosystem. Similarly based on population size, China has significantly contributed more than expected regarding 9 of these indicators. The three variables, carbon dioxide (CO2) emissions from liquid fuel consumption, CO2 emissions from solid fuel consumption, and CO2 damage, China's negative impacts have significantly progressively increased since the 1960s. The results from the database of China's Red List of vertebrates show that 22% of the threatened species have been increased from 2004 to 2015; the most severely impacted species are those in the Orders of even-toed ungulates, bats and insectivores. Horrifically, the data from the World Health Organization indicate that the impacts of environmental change in China have resulted in significantly higher proportions of liver, lung and stomach cancers, and a remarkable increase in PM10 and PM2.5 particulate matter. Some major causes generating such devastated ecosystem and impacts on China's diversity and human society have been analyzed, such as the unsustainable depletion of natural resources and land conversion, large scale deforestation and habitat destruction, agricultural and water pollution, excessive dam construction, air pollution, and urbanization. The completion of this project will provide robust fact-based evidence and information to evaluate how China's policies of eco-social development have over the years shaped Asian ecosystem, and provide sound comments and suggestions with eco-social development designers, both governmental and nongovernmental, to design eco-social development models that could maintain a sustainable ecosystem in Asia and other regions, particularly China.

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