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## Short communication

Preparing for Myanmar's environment-friendly reform<sup>☆</sup>Changjian Wang<sup>a,b,\*</sup>, Fei Wang<sup>a,b</sup>, Qiang Wang<sup>a,\*\*</sup>, Degang Yang<sup>a</sup>,  
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## ARTICLE INFO

Published on line 9 November 2012

## Keywords:

Environment-friendly reform  
Biodiversity conservation  
Environmental policy  
Myanmar

## ABSTRACT

Recently, President U. Thein Sein of Myanmar addressed a “second wave of reforms”. Myanmar is opening up to the outside world after decades of seclusion. It is a resource-rich country, remaining a strong attraction to capitals around the world. Now, Myanmar's first priority is to pay close attention to social and economic development. But it is also a global biodiversity hotspot. Myanmar's local environment, biodiversity conservation and sustainable development are encountering many threats, such as construction of large dams, large-scale gas and oil extraction, illegal wildlife trade, and deforestation.

How to develop economy and at the same time suppress the environmental degradation especially preserve imperiled biodiversity will be a major challenge to Myanmar. This article attempts to answer this question according to actionable policies and measures mentioned in the context. Preparing for Myanmar's environment-friendly reform, Myanmar should improve its own economic capabilities, make scientific policies and improve management capacity in the first place. To make the on-going reform environment-friendly and stable, Myanmar also need aid package from the international community. Infrastructure construction should consider environmental issues, and industrial policies should aim at environment-friendly direction. It is quite necessary for Myanmar to establish a ministerial level environment agency that specially deals with environment and development issues, and invest more funds to carry out and enforce their environmental policies. In addition, the establishment of a special research center, think tank, and training facility within the country can be of great help in dealing with Myanmar's environmental issues. A series of policies and plans drafted in the early times for a system of protected areas could be revived and systematically implemented with effectiveness by means of more administrative support and enough human resources and budget allocation being provided.

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<http://dx.doi.org/10.1016/j.envsci.2012.08.014>

## 1. Introduction

Myanmar is a predominantly agricultural country in Mekong River Basin, also known as Burma, the second largest country in mainland South-East Asia, known as the “Asia’s Barn” in the past years, once the world’s largest exporter of rice. Myanmar is a resource-rich country that has abundant arable land, timber, mineral resources, natural gas and oil, which made it one of the best developing countries in South-East Asia until the early 1960s. Myanmar’s total area is 676 578 km<sup>2</sup>. Forest area is 317 730 km<sup>2</sup>, 48.32% of land area; other wooded land accounts for 30.59% of land area; other land accounts for 21.09% of land area, and inland water area is 19 030 km<sup>2</sup> (FAO, 2010). Extensive changes in altitude and latitude produced a seemingly unparalleled abundance of habitats and species. Myanmar occupied completely or partially nine of the Global 200 Eco-regions (Olson and Dinerstein, 2002). Indo-Burma includes most of Myanmar is described as one of the eight hottest biodiversity hotspots (Myers et al., 2000). There is no doubt that Myanmar has an unmatched level of biological diversity. Myanmar has 7000 plant species, has 1027 known bird species, 4 of which are endemic, and 19 others are restricted range birds. Myanmar is also home to 300 known species of mammals, 425 reptile and amphibian species, and 350 freshwater fish, especially the endangered species such as the *one-horned rhinoceros*, the *Irrawaddy Dolphin* and the *Gurney’s Pitta* (BEWG, 2011).

## 2. Reform process

Myanmar is an authoritarian state, which has been governed by successive military regimes. Long-term political and economic sanctions from the western countries on the military regime hindered the country from economic and social development. Vulnerable economy and governmental mismanagement have made it one of the poorest nations in South-East Asia.

Fortunately, under the leadership of President U. Thein Sein who is leading Myanmar’s reformation from military regime to embryonic democracy, a new government was established on 31 March 2011. Encouragingly, government is established after election, rather before election the openly contested by-elections on April 1, 2012 blew wind of change to the political situation in Myanmar (Webb et al., 2012).

The western countries then released positive signals to the government in reformation. U.S. has formally eased sanctions on Myanmar, so has Canada, Australia and the European Union, expecting for a possible investment boom (Lowrey, 2012). Myanmar’s environment is at a cross-road, its future depending on how recent reforms reshape the country (Schmidt, 2012). It is the new government’s first priority to solve the issue of social and economic development in advance.

## 3. Attracting the external world

Recently, President U. Thein Sein addressed a “second wave of reforms”. Myanmar is opening up to the outside world after

decades of seclusion. Its abundant natural resources remain a strong attraction to capitals around the world. Proven natural gas reserves in Myanmar is 0.22 trillion cubic meters at the end of 2011, and its annual production 11.2 million tons oil equivalent (BP, 2012). Natural gas exports account for about 71.8% of its production in 2009 (IEA, 2011). Myanmar also has large tracts of uncultivated land resources and mangrove forests, and bio-fuels accounts for 70.0% of total primary energy supply in 2009 (IEA, 2011).

If the reform is steady, foreign investments will bring earth-shaking changes to Myanmar’s extractive industries, especially natural gas and oil, deforestation, and mining, as well as the land resources and forest resources in the near future. General Electric and Coca Cola have announced plans to do business in Myanmar (Fuller, 2012). How to develop economy and at the same time suppress the environmental degradation especially preserve imperiled biodiversity will be a major challenge to Myanmar, a global biodiversity hotspot.

## 4. Improving its own economic strength

Myanmar now is a member in ASEAN Free Trade Area (AFTA) and the Greater Mekong Sub-regional Economic Cooperation Program (GMS Program). Furthermore, it should make more efforts to participate in the Asia-Pacific Economic Cooperation (APEC), in order to create a more favorable external environment for economic and social development. But the key point is that Myanmar should continuously improve its own economic strength.

Myanmar exports teakwood but imports non-finished teak products. It exports rubber, but imports tires (Perlez, 2012). Myanmar is the only teak-exporting country, which possesses the only remaining golden teak forests in the world. Although almost half of the world’s natural teak forests are growing in this country, natural teak-forests have decreased by 1.1 million hectare between 1992 and 2010 (Utkina, 2012). Large swathes of mangroves were also lost, as a result of timber production and exportation. Myanmar is one of the five countries (Indonesia, Australia, Myanmar, Madagascar and Mozambique) with the largest net loss of mangrove area during the period 2000–2010 (FAO, 2010). Forest area decreased from 392 180 km<sup>2</sup> in 1990 to 348 680 km<sup>2</sup> in 2000, then to 333 210 km<sup>2</sup> in 2005, finally to 317 730 km<sup>2</sup> in 2010. Annual change rate is –1.17% from 1990 to 2000, –0.90% from 2000 to 2005, –0.95% from 2005 to 2010 (FAO, 2010). There is still a lot of forest left in Myanmar, but most of it has been experiencing serious deforestation for decades. Increased agricultural conversion, fuel-wood consumption, charcoal production, and logging are major reasons for forest losses (Leimgruber et al., 2005).

Illegal wildlife trade is rampant in Myanmar. Wildlife trade earns much more than traditional farming for villagers living. Overexploitation for trade becomes the primary driver of illegal hunting, resulting in the valuable species’ decline or locally extinct (Rao et al., 2010). Illegal killing and capture of elephants for trade, especially for ivory trade, continues to be a major cause of decline for Myanmar’s wild Asian Elephant populations (Shepherd and Nijman, 2008). Land tenure remains very weak in Myanmar. The state owns all the land

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