Global Biothreat and Cross-Border Resource Management: Some Findings

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Abstract

As the earth is becoming increasingly fragile, the unilateral mechanisms of solving most, if not all, border-related problems are bound to be ineffective. In the third edition of "Cross-Border Resource Management", various multidisciplinary methodologies and techniques are presented, with case studies of both traditional and new challenges of cross-border peace, vulnerability and development throughout the world.

Keywords: Border; Environmental impact; Cross-border management; Bioinvasion

The Earth as an Imbalanced Spatial Biosystem

In his New York Times bestseller Guns, Germs, and Steel: The Fates of Human Societies, which was awarded the Pulitzer Prize in 1998, Professor Jared Diamond argued that Eurasia's dense populations, high levels of trade, and living in close proximity to livestock resulted in widespread transmission of diseases, including from animals to humans. Thanks to natural selection, Eurasians were forced to develop immunity to a wide range of pathogens. However, when Europeans arrived in the Americas, European diseases (to which Americans had no immunity) ravaged the indigenous population there, rather than the other way around. As a result, the European diseases decimated indigenous populations so that relatively small numbers of Europeans could maintain their dominance [1]. In order to verify if Diamond's argument is still persuasive at modern times, I have tested the determinants of overweight or obesity of humans – represented by the body mass index (BMI) – from 1980 to 2010.

The estimated coefficients on the dummy representing countries located in the Americas, Oceania or any islands that had been isolated from the Eurasian civilizations during the pre-Columbian era are 0.460 in 1980 and 1.022 in 2010, suggesting that the BMI of peoples living in the Americas, Oceania and other islands that had been isolated from the Eurasian civilizations during the pre-Columbian era tends to increase by about 0.460 kg/m^2 in 1980 and by about 1.022 kg/m^2 in 2010 as compared with that of peoples living in the rest of the world [2]. This result shows that from 1980 to 2010 geographical contribution to overweight and obesity has sharply increased in the countries concerned. Since other explanatory variables (such as economic and racial variables) are also included in the regressions, the abovementioned figures are purely generated by the environment alone.

Over the course of the past decades, many horrific biological virus (such as Avian influenza, Ebola, to name but two), which were first found and spread in the Old World, have not shown any fatal threat on the New World. For example, Influenza A/H5N1 was first reported in China in 1996. Since 2003, more than 700 human cases of HPAI H5N1 have been reported to the WHO, primarily from countries in Asia,

Africa, the Pacific, Europe, and the Middle East [3]. However, this cannot rule out other cases now known or thereafter developed that will be of greater concerns. One example is that Ebola virus is considered as potential bioweapons [4,5].

Are There any Solutions to Cross-Border Biothreat?

"International border" is always one of the most important factors influencing the current global political and economic affairs. In the third edition of "Cross-Border Resource Management," published by Elsevier Science in 2017, I constructed an econometric model of 157 countries with different land boundaries and obtained a negative coefficient (i.e., -0.012), suggesting that, after an increase of one km-long border per 100 sq. km of land area, there will be a reduction of per capita GDP by 1.20 PPP (purchasing power parity) dollar [6]. However, regardless of their negative effect, existing international borders are still needed in certain of, if not all, countries. More specifically, while policymakers are discussing how to erase some unnecessary borders and border-related barriers, they also have to face various challenges stemming from the borderless world.

According to the Global Environmental Outlook, which was written by the United Nations Environment Program (UNEP), bioinvasion has been the second gravest threat to biodiversity in North America, after habitat destruction and degradation. In Canada, alien species have been involved in causing risk to about 25% of endangered, 31% of threatened and 16% of vulnerable species. Invasive aquatic species are particularly threatening to wetland and freshwater ecosystems and can also pose serious health risks. Alien aquatic species are expected to contribute to the extinction of native freshwater species in North America at a rate of 4% a decade in the 21st century [7-10]. The most recent example includes the accidental introduction of emerald ash borer from Asia to North America that has killed millions of ash trees there and, as it continues to spread, could extirpate the trees with devastating economic and ecological impacts [11].

Stopping bioinvasion may become more effective when more stakeholders are invited. Asian carp, which were introduced to the United States as a management tool for aquaculture and sewage treatment facilities, are thought to be highly detrimental to the environment in parts of the United States. On June 10, 2014, the US federal government carried out a project under which a lock in Minneapolis would be closed to prevent invasive carp from spreading

upstream. Under the legislation signed, the Upper St. Anthony Falls lock would be closed to boat traffic and that all the measures would have to take 25 years to complete and cost as much as US$18 billion [6]. The past years' practice shows that, though its costs were high, its progress was slow. In 2015 the Australian government decided to motivate anglers to rid its waters of the problem fish in return for a rather large bounty. The idea is to tag one carp with a special microchip. The angler who catches it will receive a $1 million when he or she turns in the fish and it is verified [6]. As fisherman tried to catch the tagged barramundi, they removed a lot of other invasive fish. There is still a cheaper method for the US to stop Asian carp. In China wild carp have now almost become an endangered species. Since many Chinese have treated carp as their favorable food, if bilateral cooperation schemes are arranged between the US and China, there will be better outcomes.

As a result of economic globalization, cross-border and global challenges have been increasing. Cross-border management is the only feasible mechanism by which to better cope with the challenges and problems resulting from the increasing interactive world. And this does work as long as certain bilateral or multilateral agreements are properly arranged. Considered in terms of the sophistication of institutional arrangements from the simplest to the most complex, cross-border development and management have been in the following forms: (i) solo model; (ii) parallel model, (iii) joint venture model, (iv) joint authority model, and (v) third-party trusteeship model [6]. These models, which vary in terms of institutional complexity, of participatory status, of easiness in implementation, as well as of the features of the targets designated for development and of the states involved, when applied in the following scenarios, have different performances: (i) solid resources, fixed boundaries, (ii) fixed boundaries, fluid resources (iii) solid resources, uncertain boundaries, and (iv) uncertain boundaries, fluid resources [6].

Conclusion

Compared to its second edition, the third edition of "Cross-Border Resource Management" has more than 50% new materials. Covering theoretical analyses, methodologies, and boxed examples and end-of-chapter cases, this 12-chapter book provides a comprehensive guidance for practitioners and classroom users.

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