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Cross-border Environmental Issues under East Asian Trade Expansion¹⁾

Hiroshi Fukagawa*

Introduction

Trade with neighboring countries in East Asia is developing along with recent globalization, and there are a growing number of discussions about promoting a Japan-China-Korea Free Trade Agreement (FTA) to further expand trade. However, many are unaware that trade expansion among countries in East Asia involves a structure that indirectly leads to cross-border environmental issues. Demand from Japan and Korea places a heavy burden on China's environment by overworking its supply system, which may cause cross-border environmental problems such as the phenomenon known as yellow sand. With that in mind, this paper examines cross-border problems involving yellow sand with the backdrop of trade expansion in East Asia.

1. The yellow sand phenomenon and damage inflicted in Japan and Korea

A look at changes in the yearly number of observations of yellow sand in Japan from 1967–2004 shows that, although starting in 1991, there were few occurrences for almost ten years, and that the number grew drastically between 2000 and 2002. Yellow sand can be blamed for specific issues in Japan, such as air pollution caused by particulate matter, impedance of aircraft operations due to impaired visibility, and the adherence of yellow sand particles to cars and laundry. During recent yellow sand occurrences, there have been instances of higher defect rates and clogged filters at plant facilities that require an extremely clean environment, such as in the semiconductor industry.

In Korea, there has been an upward trend in the number of annual occurrences of yellow sand since 1980. Yellow sand occurrences averaged 3.9 days per year in the 1980s, 7.7 days in the 1990s, and 27 days in 2001. In addition, in spring 2002 there were two instances of significant yellow sand influx and reports of subsequent damage. In March 2002, school closings affecting 4,949 kindergartens, elementary, junior high, and high schools were ordered for the first time because of yellow sand. One hundred two aircraft were grounded due to poor visibility, and operations were suspended at precision equipment plants. The number of hospital patients seeking treatment at pulmonology, dermatology, and ophthalmology departments sharply increased, and the leisure industry lost 20% in sales because people were unable to travel outside of city limits. Even department stores recorded a 10% decline in sales.

Faced with this problem, the countries concerned have created frameworks for international measures

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1) This article is revised version of Hiroshi Fukagawa "Cross-border Environmental Issues", *The Journal of Korean Economic Studies*, Vol.11, 2011.

to mitigate yellow sand, and have analyzed data gathered using scientific methods. The frameworks utilize a combination of technologies from countries such as Japan, and financial support from agents including the Asian Development Bank to monitor yellow sand occurrences and take measures to suppress desertification and other factors that cause them. However, the circumstances that generate yellow sand have not improved significantly, leading us to believe that achieving improvements quickly will not be at all easy.

That is, while measurement surveys and yellow sand monitoring have yielded some results, the focus has been placed on identifying relevant facts, causes of outbreaks, and accurately understanding and analyzing the phenomenon's impacts. Expecting to link these results directly to short-term alleviation of the harm caused by yellow sand seems unrealistic. Coming to scientific conclusions requires many years of data accumulation, and dealing with the problem promptly is quite complex. However, during that time the influx of yellow sand has continued, as has the search for alternative methods for determining the sources of the outbreaks, and more progress is anticipated.

This paper examines the mechanism of overgrazing, which is thought to be the largest factor in the generation of yellow sand, and its ties to trade in East Asia to obtain hints for resolving the problem from a different perspective than conventional analyses.

2. Desertification and overgrazing mechanisms

The growing population in China can be tied to yellow sand occurrences. As the population has grown, the demand for food and farm products has increased, and agricultural production has risen to meet that demand. During that process, the desertification of land used in crop farming progressed due to excessive cultivation of greater tracts of arable land converted from forests. In addition, livestock breeders carried out excessive pasturing, leading to encroachment on forests and water resources and causing desertification to advance.²⁾

A report from Japan's Ministry of the Environment refers to an analysis that asserts that "the frequent occurrence of yellow sand in recent years in the Northeast Asian region is caused by excessive cultivation, overgrazing, and excessive irrigation." The report cites the expertise of Lester Brown, who notes that yellow sand has become a social issue. Specifically, "The demand for food has multiplied due to growing populations and city expansion, and desertification is progressing because the soil is being overworked beyond its capacity. In particular, cultivated land is being expanded in Inner Mongolia at a rate higher than that of other regions where outbreaks occur. In addition, the removal of breeding restrictions in 1978 economic reforms brought about an increase in farm animals. The number of grazing sheep and goats has reached 30 times that of the United States. Because of a remarkable decline in vegetation, there is a need to stabilize the population and restrict the number of farm animals."³⁾ According to an environmental study group that includes the

2) Brown, Lester, *Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures*, Katsuya Fukuoka (translation supervisor), Worldwatch Japan, 2005, p. 78.

well-known Shunichi Teranishi, opinions in China are divided as to whether the major cause of yellow sand is overgrazing or the enlargement of arable land. That is, the Chinese government believes that desertification in Inner Mongolia is primarily due to overgrazing and excessive cultivation, and is pushing through settlement policies that target nomadic tribes in order to end the destruction of grasslands due to overgrazing. However, the Mongolian people oppose this policy. Ethnic Chinese make up 80% of the population of Inner Mongolia, and the Mongolians assert that it is the population pressure caused by continued growth, urbanization, and the expansion of arable land unsuitable to the dry climate that are causing the destruction of grasslands and desertification.⁴⁾

Though views differ on whether desertification is caused by overgrazing or expansion of arable land, undoubtedly both farming and livestock breeding are contributing factors. Measures to counter the expansion of farmland are being advanced through policies that restore farmland to forests,⁵⁾ but measures to counter overgrazing are lagging. As will be discussed later, the reason measures against overgrazing are not yielding results seems to be rooted in the social structure surrounding overgrazing.

Lester Brown has said that the impact of desertification caused by overgrazing is tremendous. "Pastureland is generally shared, and there is no pressing reason to restrict the number of cows, sheep, or goats each family owns. As a result, overgrazing will increase, desertification will progress, making a living will become even harder, and the growth of livestock production will slow."⁶⁾ "If too many sheep and other animals are put to pasture, vegetation will be eaten before it can be replenished, or it will be trampled by hooves and grassland will turn to wasteland. If land is tilled too frequently, the soil in arable land will be lost before the soil productivity is maintained."⁷⁾ "As grass and trees disappear, soil will be blown away by the wind. First, minute particles will be carried away as dust. Then, after the dust storms pass through, sand storms will become a significant cause of environmental deterioration. When the sand begins to drift, sand dunes will form and penetrate farmers' lands. Both pastureland and farmland will become unusable."⁸⁾ Thus, "excessive cultivation that exceeds the soil's water holding capacity and overgrazing that surpasses the regenerative power of the grassland will cause the appearance of a vast dust bowl. In the northern and western areas of China, there are regions that have lost the majority of vegetation. Strong winds that blow

3) Ministry of the Environment, "Special Committee Report on Dust and Sandstorm Issues, 2.5. DSS becomes a social issue," p. 2. (Original Text: Brown, Lester R. "China's Losing Battle with the Advancement of Yellow Sand," *Eco-Economy-Update*, June 2003.

<http://www.worldwatch-japan.org/NEWS/ecoeconomyupdate2003-6.html>.

4) Teranishi, Junichi, ed. /East Asia Environmental Information Express Messenger. *Japan-China-Korea as an Environmental Community*, Shueisha Inc., 2006, p. 152.

5) Restoring farmland to forests refers to returning cultivated land to forests and grassland by abandoning its cultivation. When this is done, farmers receive aid corresponding to the area of farmland relinquished. Ueda, Makoto. *Deteriorating Large Rivers: Facing environmental risk*, Series on issues in China, Iwanami Shoten, 2009, p. 44.

6) Brown, Lester, *op. cit.*, *Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures*, p. 78.

7) Brown, Lester, *Ibid.* p. 213.

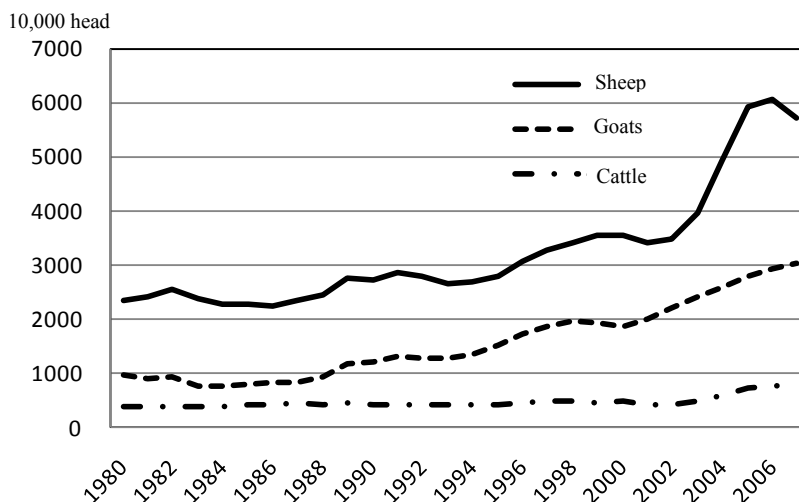
8) Brown, Lester, *Ibid.* p. 78.

from late winter to early spring will literally blow away millions of tons of topsoil in a single day.”⁹⁾

3. Countermeasures and restrictions on overgrazing

Measures against this kind of overgrazing that take into consideration the socioeconomic circumstances of the area are needed, but present conditions leave much to be desired. Systems that return farmlands to forests as a countermeasure against excessive cultivation are having some effect, but overgrazing is not improving because of constraints on the socioeconomic structures that encompass grazing.

According to Lester Brown, “Compensating farmers for restoring farmlands to forests is having a partial improvement on over cultivation. However, overgrazing has as yet been barely corrected. The number of livestock in 2003 increased to 3 times that of 1950. The grazing capacity capable of continuously supporting a certain amount of livestock is viewed as being nearly identical in China and the United States. However, a comparison of livestock in both countries reveals that China has an overwhelming number. While there are 96 million cattle in the United States, there are 103 million in China. Likewise, there are 8 million sheep and goats in the U.S., but 317 million in China. The grasslands of the western and northern areas of the Inner Mongolia Autonomous Region [...] where the distribution of sheep and goats is concentrated have been completely consumed, transforming them to barren land. The topsoil is being blown away by the wind (wind erosion), and desertification is occurring.”¹⁰⁾ “To prevent the desert from expanding, the government is calling on livestock farms to reduce their herds of sheep and goats by 40%, but the number of livestock is a



Source: Chomei, Yosuke. “The Impact on Farming Income Due to Structural Changes in Agricultural Production in the Inner Mongolia Autonomous Region of China,” p. 1.

Shifts in livestock farming in the Inner Mongolia Autonomous Region of China

measure of wealth. Moreover, in regions where most households live below the poverty line, it is no simple matter to drastically reduce herds by so much.”¹¹⁾

Confronted with the problem of overgrazing, the Chinese government has instructed herders to switch from pasturing livestock to raising them in barns, with the aim of restoring vegetation. This appears, however, to have been ineffective because of the constraints of conventional socioeconomic structures. It is difficult for those who raise livestock to suddenly change from their traditional way of stockbreeding, and as long as livestock farming is their source of income, the only way to better their lifestyles is by expanding grazing.

Speaking about these circumstances, Makoto Ueda explained that, “In Shanxi Province, sheep and goats have traditionally been put out to pasture. The sheep and other animals raised by each farm are gathered in the village square in the mornings, and the villagers charged with pasturing herd the farm animals through the mountains. This grazing promotes the degradation of vegetation. Especially in early spring, when the animals graze around the time that grasses on hills and fields are just sprouting, the sheep and other animals that were unable to eat fresh grass in winter lick up and consume the small sprouts. Since only a small amount can be eaten, the flock of sheep moves to the expansive mountain, which harms the mountain vegetation. Policies prohibiting grazing are indispensable to restoring vegetation, but farmers unaccustomed to raising livestock in a barn dislike rearing livestock in confinement and sell the animals. Since breeding confined livestock means that sheep and goats cannot be raised in hills and fields, then feed must be purchased, but in light of the costs, farmers are retiring from stockbreeding.”¹²⁾

The extent of yellow sand and the desertification that brings it on can be seen as an indicator of the growing number of grazing livestock. Yosuke Chomei charted the increase in grazing livestock, showing a remarkable rise in specific areas.

According to Chomei, “Recently, in the Inner Mongolia Autonomous Region of China (hereafter, Inner Mongolia), the destruction of ecology caused by overgrazing of livestock has become severe and is a social issue. The deterioration of the ecological environment not only impedes the continual development of stockbreeding in the region, but also creates problems that include the degradation of grasslands, desertification, drought, sandstorms, and yellow sand. It also causes heavy damage to nearby regions.”¹³⁾

Why, then, has the number of grazing livestock increased? Higher incomes for farmers that pasture their animals has been surmised as having given rise to the increase, but what is the story behind the income that encouraged the increase in the number of goats and other animals?

9) Brown, Lester, *Ibid.* p. 129.

10) Brown, Lester, *Ibid.* p. 214.

11) Brown, Lester, *Ibid.* p. 238.

12) Ueda, Makoto, *op. cit.*, *Deteriorating Large Rivers: Facing environmental risk*, p. 46.

13) Chomei, Yosuke, “The Impact on Farming Income Due to Structural Changes in Agricultural Production in the Inner Mongolia Autonomous Region of China,” The Japan Section of the Regional Science Association International 47th Presentation of Papers, National Graduate Institute for Policy Studies, October 11, 2010, p. 1.

4. Demand for cashmere products encourages overgrazing

There is an economic reason that livestock farmers have increased the number of goats they breed. Because cashmere goats have a particularly high percentage profit, their numbers grew, overgrazing occurred, and desertification resulted. According to Yoshiharu Shimizuike from the Research & Development Center for Dairy Farming, in Mongolia as well as Inner Mongolia in China, “Recent trends show the number of goats bred is increasing because cashmere can be sold at a high price.”¹⁴⁾

This rise in cashmere goats, allowing higher production of cashmere products in China and the export of products to developed nations such as Japan, has a trade-related backstory.¹⁵⁾ With the aim of investigating whether low-quality raw wool is mixed in with cashmere products from China, Nomura Research Institute conducted a detailed analysis of the social conditions associated with raw cashmere. The institute’s report clarifies recent trading trends for cashmere products exported from China to Japan.

According to the same report, “Raw cashmere from China makes up approximately 71% (about 15,435 tons/year) of all the raw cashmere produced in the world, followed by approximately 15% (about 3,173.6 tons/year) of raw cashmere from Mongolia. The two countries supply the world with over 85% of raw cashmere. In addition, the volume of raw wool produced in China and Mongolia is trending up each year. In both countries, during the 5-year period from 2000 to 2005, production increased by about 5,000 tons.”¹⁶⁾ In the past, Japan imported raw wool from China and other countries, and processed and sold it in Japan. Recently, however, products processed in China are being imported into Japan, and the importation of raw cashmere is declining. That is, “the volume of imported raw cashmere in Japan is trending down each year. At its peak in 1994, it exceeded 1,800 tons, but in 2007 it had fallen to approximately 243 tons, or a little less than 15% of the peak volume. This is believed to be because, in addition to a declining demand for cashmere in Japan, processing and manufacturing plants have spread overseas. Looking at the major exporters, in 2007 China made up approximately 74% (about 178.1 tons), while Mongolia has stayed at 17% (42.4 tons).”¹⁷⁾

In Japan, Uniqlo began selling cashmere products from Inner Mongolia at comparatively low prices around 2003. A press release from Uniqlo regarding the use of raw cashmere stated the following.

“The high quality downy hair that Uniqlo uses as raw wool is only about one-fifth the thickness of a human hair. The raw wool obtained from 1 cashmere goat yields only 80g. In short, it requires the downy hair of approximately 3 cashmere goats to make 1 sweater (underline added by author).”¹⁸⁾

14) Shimizuike, Yoshiharu, “Circumstances Surrounding Dairy Farming and Milk Cows in Mongolia,” Technology & Management Information No. 4, Research & Development Center for Dairy Farming. <http://rakusouken.net/info/004.html>

15) Nomura Research Institute, “Report on Examining the Possibility for a Certification System & Implementation of a Management System for Cashmere in Mongolia,” (FY2008 Business Strengthening of Asia’s Industrial Infrastructure), February 2009, p. 4.
<http://www.meti.go.jp/report/downloadfiles/g90415a01j.pdf>

16) Nomura Research Institute, *Ibid.* p. 3.

17) Nomura Research Institute, *Ibid.* p. 4.

Thus, there are large herds of thousands of cashmere goats behind the sweaters sold in mass quantity at low prices. A linkage becomes apparent in which, as the number of people wearing cashmere sweaters grows, the number of goats bred increases, which leads to desertification and thus the occurrence of yellow sand.

Because companies from Japan and elsewhere are taking processing and manufacturing plants overseas to China, cashmere products imported to Japan have increased. The aforementioned research report by Nomura Research Institute says that, “A look at imports of finished cashmere products in Japan shows that the volume of imports has been declining recently. Based on volume, China makes up the largest share of overall import volume at 95%.”¹⁹⁾ “While the global demand for cashmere increases, there is a shortage of supply in China to meet that demand. As a result, a gap is arising in supply and demand volume. According to estimated values announced in April 2007 by the Beijing Golden Eagle Cashmere Garments Co., Ltd., the domestic demand for cashmere in China is 11,100–12,600 tons, compared to a supply volume of 6,800–7,800 tons. The supply-demand gap surpasses supply by 4,000–5,000 tons. It is possible that the excess is being covered by unlawful imports from Mongolia and fake wool.”²⁰⁾

It can alternatively be surmised that the supply shortage is leading to trading at high prices for raw cashmere, and spurring an increase in the number of cashmere goats being bred. If so, there are economic conditions that promote overgrazing, and as long as shortages of raw cashmere continue, the number of cashmere goats put out to pasture will not decrease. Thus, it is unlikely that the overgrazing that causes desertification will stop, so the influx of yellow sand will continue.

Conclusions

As we have shown, there is a significant possibility that corporate overseas expansion and consumer demand in Japan and other developed countries contribute to the overgrazing that leads to desertification, which is a root cause of yellow sand occurrences. Proving the close causal relationship is not easy, but the possibility must be kept in mind that Japan, and its citizens’ purchases of imported, processed products from the regions where yellow sand originates may be causing desertification and yellow sand. In this regard, Hidefumi Imura once said, “The purchase of products from China means that China assumes the manufacturing of products that had until then consumed environmental resources in Japan, such as air, water, and soil. Accordingly, the environmental burden generated in Japan will decline, but the burden generated in China will increase.”²¹⁾

Cashmere sweaters, which in the past were expensive and not easily purchased, can now be bought relatively cheaply. Though a cashmere sweater allows us to get through the winter warmly, behind it lies the

18) Uniqlo press release, “Launching Sales of Sweaters Made From 100% Cashmere Produced in Inner Mongolia: Uniqlo is redefining the approach to cashmere,” September 17, 2003.

<http://www.uniqlo.com/jp/corp/pressrelease/2003/09/100.html>

19) Nomura Research Institute, *op. cit.*, p. 5.

20) Nomura Research Institute, *Ibid.* p. 12.

21) Imura, Hidefumi, *What is Happening with Environmental Issues in China?*, Kagakudojin, 2007, p. 24.

problem of desertification and the cross-border environmental issue of yellow sand carried on the winds.

In recent years, trade among neighboring countries in East Asia has been steadily progressing along with globalization, and active talks regarding a Japan-China-Korea FTA are taking place with the aim of further expanding trade. However, as has already been noted, the expansion of trade in East Asia involves a structure that indirectly leads to cross-border environmental issues. Demand from Japan and Korea places a heavy environmental burden on China by overworking the country's supply system, and potentially causes cross-border environmental problems such as yellow sand. We must pay attention to the connections between trade and cross-border environmental issues in our visions of increased trade.

References

- Brown, Lester, *Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures*, Katsuya Fukuoka (translation supervisor), Worldwatch Japan, 2005 (in Japanese).
- Chomei, Yosuke, "The Impact on Farming Income Due to Structural Changes in Agricultural Production in the Inner Mongolia Autonomous Region of China," The Japan Section of the Regional Science Association International 47th Presentation of Papers, National Graduate Institute for Policy Studies, October 11, 2010 (in Japanese).
http://jsrsai.envr.tsukuba.ac.jp/Annual_Meeting/PROG_47/index.htm
- Imura, Hidefumi, *What is Happening with Environmental Issues in China?*, Kagakudojin, 2007 (in Japanese).
- Ministry of the Environment, "Special Committee Report on Dust and Sandstorm Issues," September 2005 (in Japanese).
<http://www.env.go.jp/earth/dss/torikumi/chosa/rep1.html>
- Nomura Research Institute, "Report on Examining the Possibility for a Certification System & Implementation of a Management System for Cashmere in Mongolia," (FY2008 Business Strengthening of Asia's Industrial Infrastructure), February 2009 (in Japanese).
<http://www.meti.go.jp/report/downloadfiles/g90415a01j.pdf>
- Shimizuike, Yoshiharu, "Circumstances Surrounding Dairy Farming and Milk Cows in Mongolia," (Technology & Management Information No. 4), Research & Development Center for Dairy Farming, *Rakusoken*, 2006 (in Japanese). <http://raku-souken.net/info/004.html>
- Teranishi, Shunichi, ed./East Asia Environmental Information Express Messenger, *Japan-China-Korea as an Environmental Community*, Shueisha Inc., 2006 (in Japanese).
- Ueda, Makoto, *Deteriorating Large Rivers: Facing environmental risk*, Series on issues in China, Iwanami Shoten, 2009 (in Japanese).

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