Study on transnational environmental damage along the belt and road and its enlightenment on international energetic policy

W Lu
Shanghai University of Political Science and Law (SHUPL), Personnel Division, Shanghai, China
E-mail: lwly1201@163.com

Abstract. This paper selects the most tabular areas of Central Asia and Southeast Asia along the route of Belt and Road Initiative and analyzes the causes and current situation of the cases of transnational environmental damage in the two regions. Through the data and charts, this paper sums up the present situation of the co-existence of nuclear pollution and Aral Sea crisis in Central Asia and the serious pollution of water resources caused by frequent fire in Southeast Asia. And this paper analyzes the impact of this environmental situation on the formulation and implementation of energy policy along the Belt and Road.

1. Transnational environmental pollution in Central Asia
Central Asia and China have a common border of more than 3,000 kilometers and are located at the junction of the Asia-Europe continent. They are the main thoroughfare for land transport between the east and the west and an important transit point for the "Silk Road Economic Belt." Its geographical location is so important. It is particularly important to address the existing and potential transboundary environmental damage in Central Asia [1].

1.1. Rich resources
Central Asia is rich in renewable energy resources. First of all, Central Asia has excellent sunshine conditions. According to relevant statistics, the total solar radiation per year in Central Asia reaches Joule per square meter (m²), which is higher than the total solar radiation in our country, the most abundant part of the Tibetan Plateau, Abundant solar energy resources also make Central A. (See table 1)

| National Land area (Square kilometers) | land area (Ten thousand hectares) | Agricultural land area (Ten thousand hectares) | cultivated area (Ten thousand hectares) |
|----------------------------------------|-----------------------------------|-----------------------------------------------|----------------------------------------|
| Kyrgyzstan                             | 19.99                             | 1918                                          | 1073                                   | 131                                    |
| Uzbekistan                             | 44.74                             | 4254                                          | 2725.9                                 | 470                                    |
| Kazakhstan                             | 272.49                            | 26997                                         | 20778.4                                | 2255                                   |
| Turkmenistan                           | 48.81                             | 4699.3                                        | 3296.6                                 | 220                                    |
| Tajikistan                             | 14.31                             | 1399.6                                        | 425.5                                  | 93                                     |

Table 1. Land resource status of Xinjiang, China and five Central Asian countries.
1.2. Nuclear pollution

Nuclear energy occupies an important position in the energy resource structure of Central Asia. According to relevant statistics of the International Atomic Energy Agency, Kazakhstan has the second largest amount of uranium resources in the world and Uzbekistan is the tenth in the world. However, nuclear energy development is likely to cause incalculable and irreparable damage to the environment and humanity itself. During the development and use of the rich nuclear energy resources in Central Asia, transnational nuclear pollution has already been created [2].

It is estimated that the radiation dose to nuclear tailings and radioactive material landfills in Kyrgyzstan is 100-200 Torrents/hour, and even some regions have reached 2000-3000 Torr/hour, which not only endangered the ecology and people of Kyrgyzstan's own country, but also with the flow of nuclear waste into rivers, these dangerous substances have also flowed to other parts of Central Asia. The state has seriously polluted the ecological environment of other countries and endangered the health of people in other countries. According to relevant statistics, in Uzbekistan, Tajikistan, and Kazakhstan, the number of residents who were harmed was 2.4 million, 700,000 and 900,000 respectively. For Kyrgyzstan and other countries in Central Asia, the problem of nuclear pollution needs to be solved urgently [3].

1.3. Aral crisis

In addition to serious nuclear pollution, the more serious problem in Central Asia is the transnational water pollution caused by the lack of water resources and the resulting ecological problems.

In Central Asia, landforms are dominated by deserts and grasslands, and water resources are not sufficient. Coupled with the excessive development and use of water resources by countries in the basin, water resources are seriously polluted, and serious water appears in Central Asia. (See table 2) Resource crisis [4].

| country          | Renewable inland freshwater resources (1 billion cubic meters) | Annual freshwater withdrawal (billion cubic meters) | Human resources (cubic meters) |
|------------------|---------------------------------------------------------------|-----------------------------------------------------|-------------------------------|
| Kyrgyzstan       | 49                                                            | 8                                                   | 4039                          |
| Uzbekistan       | 16                                                            | 56                                                  | 1937                          |
| Tajikistan       | 63                                                            | 11.5                                                | 2424                          |
| Kazakhstan       | 64                                                            | 21                                                  | 7307                          |
| Turkmenistan     | 1                                                             | 28                                                  | 4333                          |
| total            | 193                                                           | 124.5                                               | 3788                          |

Source: World Bank Database

Data Description:
- Renewable inland freshwater resources refer to domestic renewable resources (inland rivers and surface water produced by rainfall)
- The annual freshwater withdrawal refers to the total water withdrawal, which is not included in the evaporation loss of the reservoir. In countries where the desalination plant is an important source of water, the amount extracted also includes water from the desalination plant.

The Aral Sea ecological crisis is the most typical case in the water crisis in Central Asia. Since the
1960s, the amount of water injected into the Aral Sea has decreased by 75%, the water level has dropped by about 20 meters, and animal and plant resources have also been severely damaged. Degradation of large areas of land and reduction in grain production have a direct impact on the lives and health of the surrounding 35 million people. The incidence of nearby residents has risen sharply. Infant mortality increased; arthritis increased 60-fold, and anemia in women reached 80% in some areas. The United Nations Programme has stated that "in addition to Chernobyl, no region could ever be found on Earth. The depth of its profound ecological crisis has been so great that there are so many people involved in the crisis of life ", can see its severity.

In the midst of the harsh environmental conditions in Central Asia, implementing the “One Belt and One Road” strategy will inevitably confront the arduous nature of development tasks and the fragility of the ecological environment, such as competition for river resources and transboundary damage to water pollution. In the process of cargo transportation, energy consumption and waste gas emissions, some investment projects do not consider the environmental damage caused by the local ecological environment, and so on. With so many complex and complicated issues, if these issues cannot be handled properly, they will affect the friendly relations of the relevant countries. The implementation of the "One Belt and One Road" strategy will encounter even greater obstacles.

2. Transnational environmental pollution in Southeast Asia
China and Southeast Asian countries are currently the main bodies of the “21st Century Maritime Silk Road” cooperation, and Southeast Asia is also an important part of the Silk Road Economic Belt. It can be said that the Southeast Asia region is the top priority for implementing the “One Belt and One Road” strategy [5].

2.1. Southeast Asia smog crisis
According to research from international agencies, Southeast Asia is currently the hardest-hit area for air pollution.

In June 2015, a forest fire broke out in Indonesia. The fire was affected by El Niño and continued to burn for several months. The resulting air pollution was particularly serious. According to statistics, the greenhouse gas emissions during this forest fire exceeded 600 million tons, which is equivalent to the annual emissions of Germany; Malaysia, Singapore and other Southeast Asian neighboring countries were all covered by haze. PSI was used as a measure of atmospheric pollution. Indicators can be seen in Singapore's atmospheric changes from September to November. From mid-September to late October, the air quality in Singapore has been severely degraded, and the PSI has even reached more than 400 during the period. This shows that the impact of this fire is more and more serious. Due to its impact, civil aviation flights were suspended and the school was suspended. In March 2016, Singapore officials stated that the smoke caused by the forest fire brought about more than US$507 million in economic losses to Singapore. This figure does not include damage to human health caused by air pollution.

After the fire broke out, Singapore had offered to help Indonesian fire control, but it was rejected by the Indonesian side; Indonesia’ s attitude and practice in dealing with this issue have been criticized by many countries in Southeast Asia.

In fact, every year in Indonesia, a forest fire occurs in the dry season. In 1997, there was a serious forest fire. It now appears that the severity of the fire in 2015 may have exceeded the severity of the fire in 1997. It has been happening for almost a year. The follow-up problems caused by the fire have not yet been properly resolved and have affected the relations between the countries concerned. We can expect that the forest fire in Indonesia will still be affected by the natural environment during the dry season.

The coming of the festival will continue to affect Southeast Asian countries including Malaysia and Singapore. This will create a vicious circle that will not only be of no benefit to the management of the ecological environment, but will also affect the relations and regional stability in the Southeast Asian region. Impede the implementation of the "One Belt and One Road" strategy.
2.2. Transnational water pollution
The Lancang-Mekong River is the largest international river in Southeast Asia and flows through China, Laos, Myanmar, Thailand, Cambodia, and Vietnam [6]. The Lancang-Mekong River Basin has rich and unique resources such as: biological resources, hydropower resources, and mineral resources. It is undeniable that moderate development and utilization of resources within the basin can promote economic development in related areas and improve the living standards of people along the coast. However, over-exploitation of resources and the implementation of a large number of economic activities will lead to problems of transnational water pollution and further affect the area. Peace and stability.

Human activities have caused direct and indirect pollution to rivers. The major ones include: (1) Agricultural irrigation. The Mekong River is an agricultural country, relying on the water supply of the Mekong River for irrigation of crops, which will affect the ecological environment of the river basin in two ways: flood irrigation leads to the reduction of water resources, and harmful chemicals in pesticides are fed into river pollution sources. (2) Overfishing. Due to human activities, many of the living creatures in the Mekong River Basin are on the verge of extinction or even extinct, seriously affecting regional biodiversity. (3) The development of waterways has made the Mekong River an important cargo shipping channel. The increase in ships has brought about oil pollution and ship garbage, and has also affected the river's environment.

The ecological damage in the Lancang-Mekong River Basin has been very serious, but so far, the coastal countries have not negotiated a feasible solution. Not only that, but some extra-territorial countries have constantly intervened in the Lancang-Mekong River basin for their political interests, making the problems in this area more complicated

3. The guidance on international energy policy
Central Asia and Southeast Asia are the most valuable areas for investment and cooperation along the "Belt and Road Initiative" route. In particular, the great potential of renewable energy development in Central Asia is in line with the energy development strategy advocated in the 13th five-year Plan of Renewable Energy Development in China. But under the background that our country regards nuclear power cooperation as the "Belt and Road Initiative" high-end cooperation project, the serious nuclear pollution and the shortage of water resources in Central Asia are one of the obstacles to the establishment of a perfect international energy cooperation system. This requires our country to integrate eco-environmental protection into policy-making when cooperating with the Central Asian region, and to focus on renewable energy in this region. In order to achieve mutual benefit and win-win results and safeguard international energy security, the relationship between energy cooperation and protection of fragile ecological environment should be properly handled in order to achieve mutual benefit and win-win results.

Southeast Asia has great value of exploitation and cooperation because of its abundant water resources, but at the same time, the overexploitation of the resources has caused the present situation of environmental pollution and ecological damage in the region. In the process of energy cooperation with countries of similar regions, the ecological protection policy must be tilted and the green Belt and Road Initiative energy cooperation system should be set up to achieve the win-win goal of energy cooperation and avoid the aggravation of ecological crisis at the same time.

In the context of the ecological environment damage, the requirements of the host country to the energy investment country in environmental protection will be improved, and in order not to affect the stability of energy cooperation, the concept of sustainable development must be set up in the international energy cooperation policy, and the establishment of a low-carbon modern energy system is promoted. The transformation and evolution of the international energy structure should also be pushed on.

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