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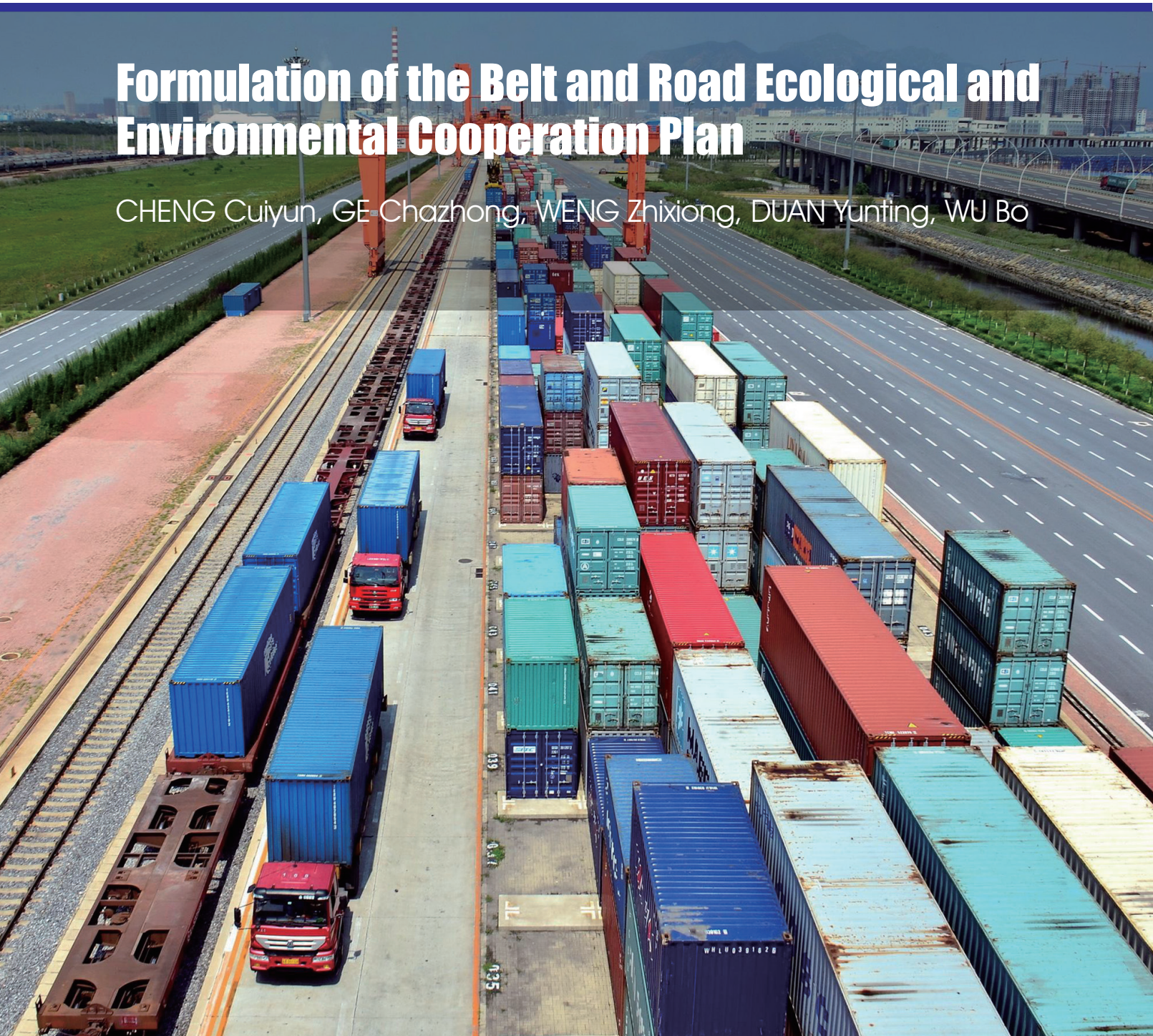

Formulation of the Belt and Road Ecological and Environmental Cooperation Plan

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Foreword »

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Since its opening-up and reform, China has been in the process of rapid economic development with its people enjoying an increasingly improved standard of life. Meanwhile accompanying this dramatic economic growth is the degradation of environment which has, to some extent, damaged the gains of the opening-up and reform and prevented the economy from a healthy and sustainable development. The Chinese government is increasingly aware of that without addressing the environmental issues it is facing now will jeopardize its long term goal of the great rejuvenation of the Chinese nation. Given the magnitude and complexity of the environmental issues in China, there is no easy way in addressing them and the solution to them entails an equal priority being given to environmental protection, ecological conservation and economic development or even higher than the latter by mainstreaming the former into the overall socio-economic decision-making process. As a matter of fact, China has been in the struggle against environmental pollution since the very beginning of its economic take-off and trying to explore a pathway that could help address China's environmental issues in the way most suitable to China's specific circumstances.

In recent years, especially since the 12th Five-Year Plan period, the enhanced measures including legislation, policy, regulatory and economic means have been taken by the Chinese government in dealing with environmental problems, of which environmental policies have played an important role in this regard. Corresponding to this situation and in meeting the demand of governments at different levels for environmental policy tools, the environmental policy research projects on topics of a wide range have been conducted by some Chinese environmental research institutions including the Chinese Academy for Environmental Planning (CAEP).

CAEP founded in 2001 is a research advisory body supporting governments in the

development of key environmental planning, national environmental policies, and major environmental engineering projects. In the past more than 10 years, CAEP has accomplished the development of the overall planning of national environmental protection for the 10th, 11th and 12th Five-Year Plan periods; water pollution prevention and control planning for key river basins; air pollution prevention and control planning for key regions; soil pollution prevention and control planning; and some regional environmental protection plans. In the same period of time, CAEP also actively engaged in research on such topics as green GDP, environmental taxation, emission trading, ecological compensation, green financing, etc. By so doing, CAEP has become an indispensable advisory body in the environmental decision-making in mainland China. According to *2013 Global Go To Think Tanks Report and Policy Advice* published by University of Pennsylvania, CAEP was ranked 31 in the field of environment in the world. Many of CAEP's research results and project outcomes regarding environmental policies have drawn great attention of decision makers and international institutions, and have been utilized to contribute to the formulation of national environmental policies concerned.

The Chinese Environmental Policy Research Working Paper (CEPRWP) is a new internal publication produced by CAEP for the purpose of facilitating the academic exchange with foreign colleagues in this field, in which the selected research papers on environmental policies from CAEP are set out on the irregular basis. It is expected that this publication will not only make CAEP's research results on environmental policies be known by foreign colleagues but also serve as a catalyst for creating opportunity of international cooperation in the field of environmental policies, and environmental economics in particular, with a view of both the academic research and practical policy needs.

Chinese Academy for Environmental Planning (CAEP) kicked off the study and formulation of the Belt and Road cooperation plan for ecological and environmental protection starting from 2016. After hard work, On May 12, 2017, the Belt and Road Ecological and Environmental Cooperation Plan was printed and issued by Chinese Ministry of Environmental Protection (MEP) and included in List of Deliverables of the Belt and Road Forum for International Cooperation to effectively serve China's political diplomacy. Aiming at win-win situation through multi-dimensional cooperation, the Plan highlights the collaboration of governments, enterprises, think tanks, social organizations, and financial institutions in both domestic and international contexts, and identifies the priorities of cooperation in policy coordination, infrastructure connectivity, unimpeded trade, financial integration, people-to-people bond, and capacity building. It is of important significance for guiding the joint construction of green silk road.

Contents

1. INTRODUCTION

In September and October 2013, Chinese President Xi Jinping successively proposed the major initiative to jointly build the Silk Road Economic Zone and 21st-Century Maritime Silk Road (hereinafter referred to as the Belt and Road). Ever since then, the core values, underlying principles and main contents of the initiative have been increasingly accepted and recognized by the people of countries along the Belt and Road. A number of major programs and international production capacity cooperation projects have been implemented. Ecological and environmental protection is the key to the success of Belt and Road initiative. It has been identified as one of the eight priorities as state leaders attach great importance to building the Belt and Road in an eco-friendly way. With the advancement of initiative at a deeper level, environment has become the focus of top concerns in the international community. According to the unified deployment of the Leading Group for Belt and Road Initiative, Chinese Ministry of Environmental Protection (MEP) has made active efforts and achieved favorable results, such as the establishment of China-Arab States Cooperation Forum, China-ASEAN Environmental Cooperation Forum, Parallel Forum on Environmental Cooperation of Euro-Asian Economic Forum, International High-level Dialogue on Ecological and Environmental Protection under the Framework of Belt and Road Initiative (Shenzhen), Big Data Service Platform for Ecological and Environmental Protection, and cooperation on environmental technological and industrial transfer.

In line with the requirements of the Leading Group for Belt and Road Initiative, Chinese Academy for Environmental Planning (CAEP) kicked off the study and formulation of Belt and Road cooperation plan for ecological and environmental protection in 2016. It completed multiple thematic studies and formed policy study reports, covering economic situation for environmental protection, strategic policy for environmental protection, typical cases of green foreign investment and cooperation, green investment, green trade, and foreign technical assistance projects supporting green Belt and Road initiative. Based on serial preliminary research, the Belt and Road Ecological and Environmental Cooperation Plan (hereinafter referred to as the Plan) was formulated. In this process, CAEP maintained communication with the MEP Department of International Cooperation on the framework, objectives, and contents of the Plan, especially the alignment to reflect embodied objectives and tasks pursuant to the Vision and Actions on Jointly Building the Silk Road Economic Belt and 21st-Century Maritime Silk Road, 13th Five-Year Plan for Protecting the Ecological Environment, Outline of the 13th Five-Year Plan for International Cooperation on Environmental Protection, and Guiding Opinions on Promoting Green Belt and Road. In March 2017, the draft Plan for approval was finalized after careful revision to the draft for comment according to the opinions of relevant departments and agencies directly under the academy. On May 12, 2017, the Plan was printed and issued by MEP and included in List of Deliverables of the Belt and Road Forum for International Cooperation to effectively serve China's political diplomacy. As an action plan that guides Belt and Road ecological and environmental cooperation in the current and future periods, the Plan highlights the concepts of ecological progress and green

development and aims at cooperation and win-win in multiple dimensions. It calls for the collaboration of diverse participants, including governments, enterprises, think tanks, social organizations, and financial institutions, in the contexts of domestic and international cooperation, and sets down six key tasks, including policy coordination, infrastructure connectivity, unimpeded trade, financial integration, people-to-people bond, and capacity building.

2. ECO-ENVIRONMENTAL STATUS AND PROBLEMS OF THE BELT AND ROAD

The Belt and Road runs through the Asia and Africa continents and connects the vibrant East Asian economic circle and developed European economic circle. Countries along the Belt and Road, mostly emerging economies and developing countries, approximately have a total population of 4.4 billion and a total economic output of 21 trillion US dollars, accounting for 63% and 29% of the world respectively. The sharp contrast between small economy and huge population arouses strong demand and motivation for economic construction and development, indicating broad prospects for mutually beneficial cooperation among countries and regions along the Belt and Road.

Figure 1 Coverage of the Belt and Road Initiative

Table 1 65 Countries and Regions Along the Belt and Road

Region	Country
Association of South East Asian Nations (ASEAN)	Singapore, Malaysia, Indonesia, Myanmar, Thailand, Laos, Cambodia, Vietnam, Brunei, and the Philippines
West Asia	Iran, Iraq, Turkey, Syria, Jordan, Lebanon, Israel, Palestine, Saudi Arabia, Yemen, Oman, United Arab Emirates (UAE), Qatar, Kuwait, Bahrain, Greece, Cyprus, and Egypt
East Asia	Mongolia
South Asia	India, Pakistan, Bangladesh, Afghanistan, Sri Lanka, Maldives, Nepal, and Bhutan
Central Asia	Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan
Commonwealth of Independent States (CIS, 7)	Russia, Ukraine, Belarus, Georgia, Azerbaijan, Armenia and Moldova
Central and Eastern Europe (CEE)	Poland, Lithuania, Estonia, Latvia, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Albania, Romania, Bulgaria , and Macedonia

However, there are large differences in the development stage, political system, legal standards, religious beliefs and customs, as well as resources and eco-environmental endowments. We need to base ourselves upon the eco-environmental context while deepening cooperation in the fields of resource, energy, infrastructure, industry and finance. It is necessary to identify all kinds of eco-environmental risks and well handle the development-protection relationship to ensure the smooth implementation of the Belt and Road Initiative.

2.1 Complex and Diverse Natural Environment

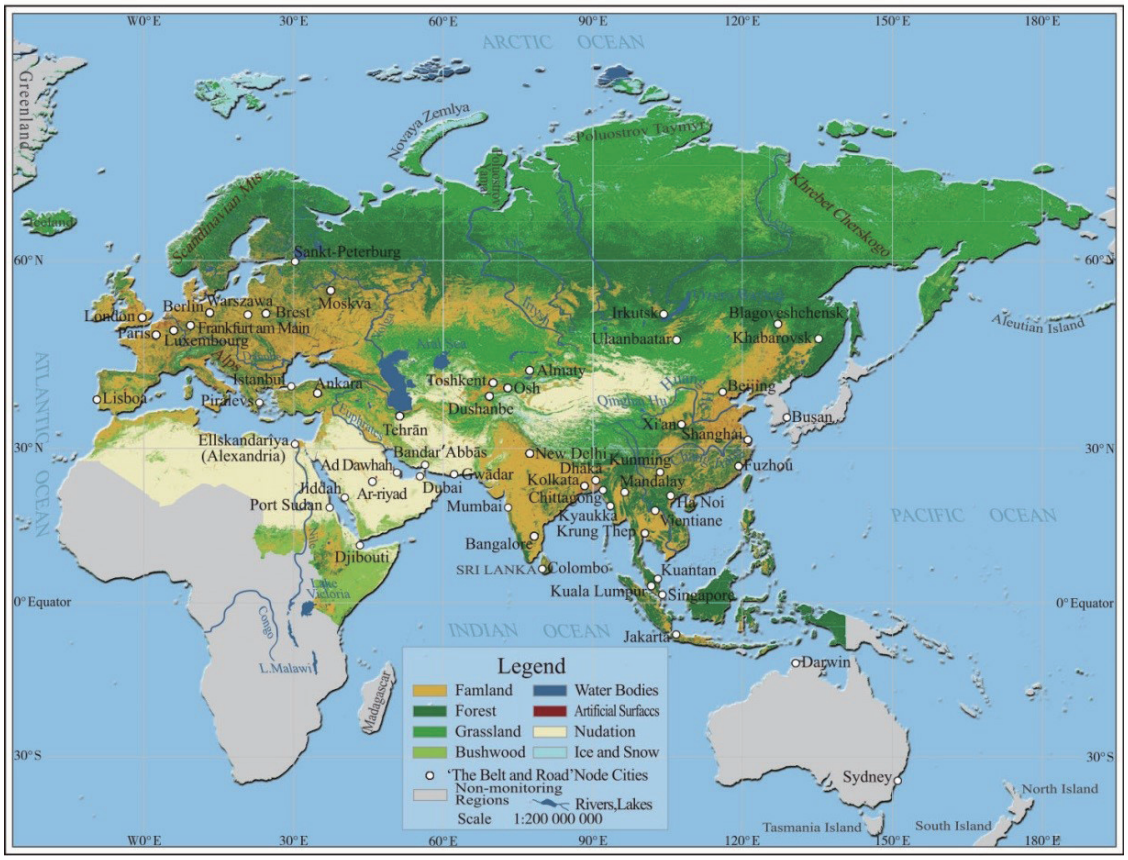
The Belt and Road embraces 357 of the 867 ecological zones in the world, representing 41.2% of the total. The vast terrestrial area encompasses the world's highest plateaus and mountains, fertile plains and deltas, tropical rain forests, extremely arid wilderness and deserts, and unusually cold polar caps. The marine area covers the western Pacific, Indian Ocean, and eastern Atlantic, and suffers such long-standing problems as natural coastal land loss, excessive land-based emissions, frequent ecological disasters, and fishery resource exhaustion.

2.1.1 Topography. The landforms in countries along the Belt and Road include plains, plateaus, and mountains. The areas less than 3,500 meters above sea level account for about 95.96%, less than 1,000 meters above sea level 77.33%, and less than 200 meters above sea level 31.3%.

2.1.2 Soils. The soil structure is diverse in countries along the Belt and Road. According to the Digital Soil Map of the World (1-km resolution) published by the Food and Agriculture Organization of United Nations (FAO) in 2012, there are 30 soil groups in these countries, of which rankers account for about 12%, cambisols 9%, and calcisols and podzols 8% each.

2.1.3 Vegetation. In Siberian and Europe in northern Silk Road Economic Belt, the vegetation is dominated by broad-leaved forests and coniferous forests, but relatively sparse in North Africa, Middle East, Central Asia, and northwestern China due to vast bare land (Gobi Desert). Especially, the ecological environment is fragile in the middle section of the Second Eurasian Continental Bridge, with relatively infertile soil and large desert and wild area in northwestern China, Mongolia, Central and Western Asia, and North Africa.

Figure 2 Vegetation in the Belt and Road



Source: 2015 Annual Report on Remote Sensing Monitoring of Global Ecological Environment (Belt and Road Ecological Environmental Status).

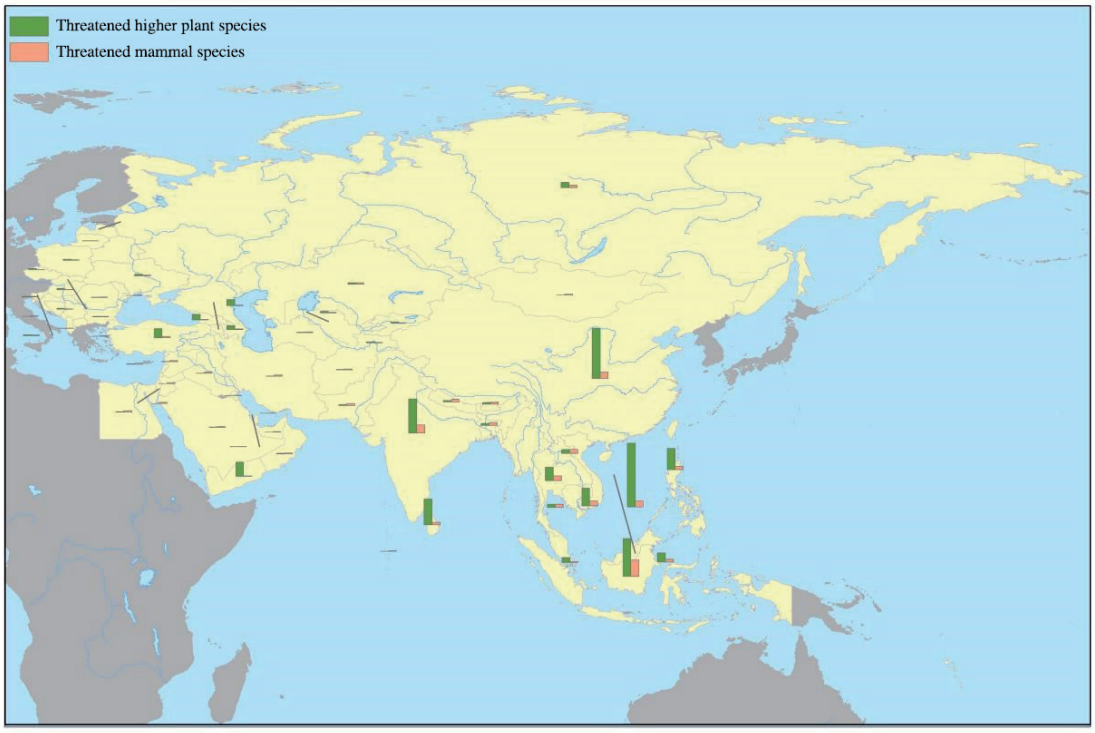
2.1.4 Biodiversity. Despite rich biodiversity, species are seriously threatened in countries along the Belt and Road. In 2014, the threatened species of higher plants numbered 3,778, mammals 1,269, birds 1,167, and fish 3,000, accounting for 27.8%, 39.1%, 32.2% and 28.9% of the world's total.

Table 2 Ecological Environment in the Belt and Road

Category	Indicators	Belt and Road	World	Percentage of the world
Ecological carrying capacity	Total global hectares (million, 2011)	4607.4	12008.3	38.4
	Global hectare (gha) per person (2011)	1.05	1.72	61.0
Threatened animal and plant species	Threatened mammal species (2014)	1269	3246	39.1
	Threatened bird species (2014)	1167	3625	32.2
	Threatened fish species (2014)	1983	6870	28.9
	Threatened higher plant species (2014)	3778	13583	27.8
Land cover	Land area (km2)	50083198	129733917	38.6
	Forest area (km2, 2012)	14414350.6	39430117	36.6
	Forest coverage (%, 2012)	28.78	30.98	94.7

Source: Comprehensive Performance Development Assessment of Resources and Environment in World's Major Countries (1990-2012), Chinese Academy of Sciences.

Figure 3 Threatened Plant and Mammal Species in the Belt and Road (2015)



2.2 Fragile Ecological Environment Overall

More than 60% of the Belt and Road are arid and semi-arid grassland, wild area, and high-altitude ecologically fragile area (EFA) with dry climate and small rainfall. In particular, northeastern Africa, West Asia, Central Asia, South Asia, and western China on the Silk Road are among the driest and suffer grave water shortage, wilderness and desertification. In Kazakhstan, for example, about 66% of the land is gradually degraded and nearly 180 million hectares of land has been desertified, indicating extremely fragile ecological environment (Table 3). Regarding water resources, West Asia, Central Asia, and Mongolia are exposed to high risk (Figure 4) and confronted with severe challenges in sustainable development. China is not optimistic as desertification turns acute in central and western areas, noticeably Xinjiang and Ningxia, and the soil erosion rate is up to 64.34% in certain areas. By 2045 or so, China's Xinjiang and Central Asia may face a drastic reduction in river runoff due to accelerated glacial ablation in global warming context, according to Chinese Academy of Sciences (CAS).

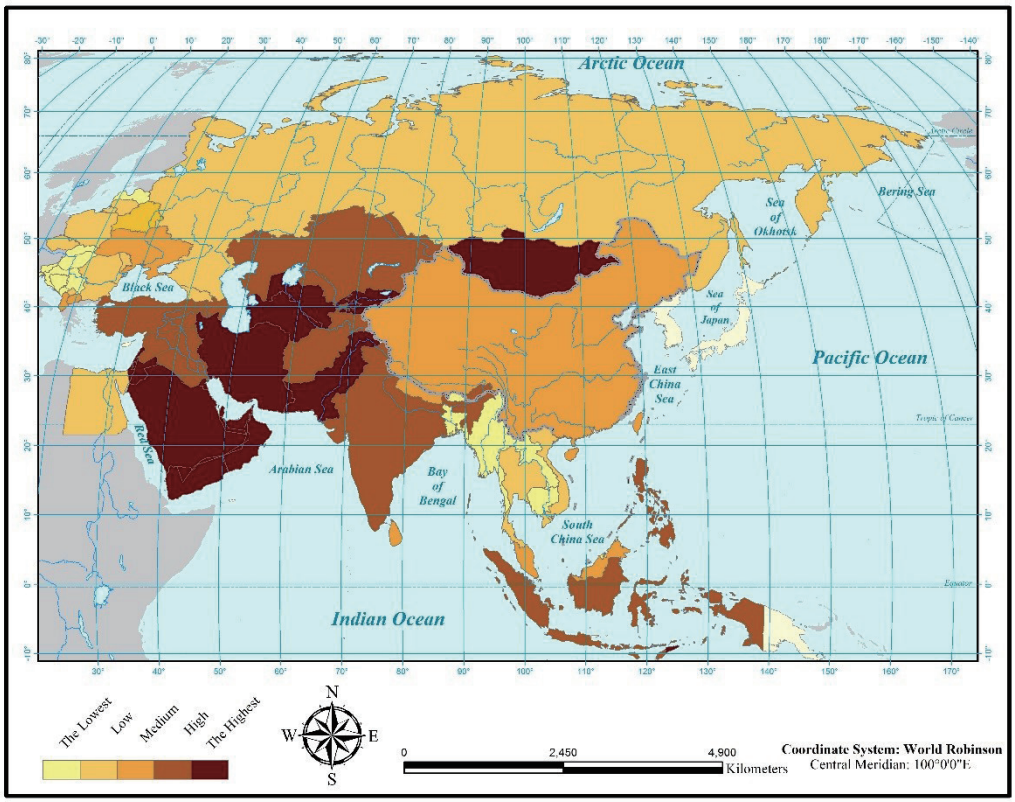
In addition, the tropical rain forests and subtropical mountain forests in Southeast Asia and South Asia are the key areas of global biodiversity conservation. The subarctic coniferous forests in high-latitude Eurasian slowly grow and hardly recover from damage due to poor recovery ability.

Table 3 Comparison of Annual Precipitation and Renewable Freshwater Resources in Different Regions (2013)

Region	Annual precipitation (mm)	Annual renewable freshwater resources (100 million m^3)	Annual renewable freshwater resources per capita (m^3)
World	814	429210	5996
Asia	828	118650	2756
Middle East / West Asia	217	48401	503
Central Asia	273	2420	2545
South Asia and East Asia	1139	111390	2865
Europe	545	65780	8846
Africa	677	39310	3545
North Africa	96	470	274

Source: Consolidation based on relevant information

Figure 4 Water Resource Risk Assessment in the Belt and Road



2.2.1 Central Asia: Extremely Uneven Spatial and Temporal Distribution of Water Resources

Among the five Central Asian countries, Kazakhstan, Kyrgyzstan, and Tajikistan have relatively large amounts of water resources, while Turkmenistan and Uzbekistan have scarce water resources. As a whole, freshwater reserves in Central Asia exceed 10000*108 m^3, but mainly exist in difficult-to-exploit forms, such as ice. Water use depends on the Amu Darya originating in Tajikistan and the Syr Darya originating in Kyrgyzstan. However, the extremely uneven spatial and temporal distribution of water resources in the basins of Amu Darya and Syr Darya, coupled with unreasonable utilization, waste and pollution, sparks prominent contradictions in the development and utilization of water resources. To be specific, about 80% of the river runoff flows to Kyrgyzstan and Tajikistan located in the upper reaches with numerous mountains, and little to Kazakhstan, Turkmenistan, and Uzbekistan mainly covered by plain lowlands.

2.2.2 West Asia: More Water Resources in the South and Less in the North

In the world-famous Euphrates-Tigris river basin of West Asia, Turkey has abundant water and hydropower resources, while Syria and Iraq are relatively short of water resources. Euphrates and Tigris are replenished by upstream meltwater. Turkey, the water-richest country located in the river source and the upper reaches, presents high water utilization rate and annual water

supplies beyond 3,000 m^3 per person. Syria and Iraq sees runoff dissipation in the relatively flat terrain, so water resources available for development and utilization are limited. They even experience water stress as the annual water supplies drop below than the internationally recognized level of 1,700 m^3 per person. In addition, the annual precipitation is up to 500-1000mm in Turkey, but less than 200mm in Syria and Iraq. Precipitation mainly occurs from October to next April, but rarely in May-September when crops need to be irrigated.

2.2.3 Middle East and North Africa: Water Shortage and Huge Freshwater Consumption Per Capita

Up to 12 of the 15 most water-scarce countries are situated in the Middle East and North Africa, including Algeria, Libya, Saudi Arabia, and Yemen. What is worse, winter precipitation in the region, which used to be moderate, declines year by year due to climate change. According to statistics, by 2030, the lack of drinking water will seriously threaten the health of residents in the region and restrict the socio-economic development of 17 countries. By 2050, the annual water availability per capita will fall below 200m^3 in two-thirds of the countries in the region. Despite severe water shortfall, freshwater consumption per capita in the Persian Gulf Arab region is still above the international average, such as Qatar and Oman, and even 91% and 83% higher in Saudi Arabia and United Arab Emirates respectively.

2.2.4 South Asia, East Asia, Central and Eastern Europe: Relatively Adequate Water Resources

Relative to water-scarce regions, water resources overall are enough in East Asia and South Asia and abundant in Central and Eastern Europe. The 16 CEE countries enjoy many river basins and adequate water and precipitation resources. There is a sharp disparity in South Asia and East Asia. Russia, a large water user with numerous lakes, ranks the world's second of total water resources and raises water availability per capita to 30,600 m^3. Nepal accounts for 2.27% of the world's freshwater resources; Bhutan makes into world's top ten of per capita freshwater resources; and Bangladesh takes the world's third position of freshwater resources. In contrast to these water-rich countries, India and Pakistan suffer water shortage with generally low annual water availability per capita.

2.2.5 Northwest China: Grim Water Shortage

The annual precipitation is less than 400 mm in China's northwestern region. The water shortage rate exceeds 10% in northern slope of the Tianshan Mountains, and the water resource exploitation approaches the carrying capacity in southern Xinjiang. The situation of urban water supply situation looks grim, with annual water supplies per capita of the western part equal to half of the eastern part. The function of water supply in the western part has been significantly impaired by variable and intense drought and flood disasters. Bosten Lake, the former largest freshwater lake in Xinjiang, ends up with salt water after a cumulative water level decline of 3.54 meters and surface area reduction of 120 km2 over the 30 years.

2.3 Prominent Development-protection Contradictions and Harsh Environmental Pollution Situation

The developing countries along the Belt

and Road, with low socio-economic levels, generally face the challenges of environmental pollution and ecological degradation brought by global industrial transfer. Under the extensive model of economic growth, the unrestrained and unsustainable use of natural resources also leads to a variety of environmental problems, such as forest reduction, water and air pollution, and biodiversity loss in ASEAN countries, and water, air and soil pollution, biodiversity loss, and nuclear pollution in Central Asian countries. The pressure of marine environmental protection also mounts in closed seas in Rotterdam, Dubai-Abbas-Doha, and Karachi due to excessive use of marine resources and massive emissions of land-based pollutants.

2.3.1 Serious Land Abuse in some Areas

The biggest environmental problem facing Southeast Asia is sedimentation caused by agricultural production, forest degradation and seabed excavation and mining. The sediment load of Citarum in West Java, Indonesia almost increases by six times every two years as a result of large-scale deforestation for agriculture in the confluence area. Similarly, a large amount of sediment flows from estuaries into the Gulf of Thailand every year. The same consequences also occur in the Philippines and Malaysia, which can be attributed to poor management in the confluence and agricultural areas.

In the Middle East, land misuse is very serious. Roads, airports, housing and other construction projects take up a lot of arable land. In addition, abnormal changes in climatic conditions further aggravate droughts and expedite soil degradation. If the sea level further rises under the Earth's greenhouse effect, one-fifth of cultivated land in the Nile Delta will be swallowed up, according to a joint study of the United Nations and the United States Environmental Protection Agency.

Mongolia is made up of plateaus, mountains, and more importantly grasslands. However, there is an escalation in grassland desertification as a result of man-made overgrazing, uncontrolled grass use, and mineral resource over-exploitation. Dust storms become frequent with accelerated loss of plant species in forest steppe, typical grassland, upland meadow, and desert. The serious desertification around deserts and settlements has affected the normal life of residents.

2.3.2 Grave Regional Water Pollution Undermining Economic Development and Social Stability

Central Asia is located in the Eurasian hinterland and dominated by arid deserts and grasslands. The most prominent environmental problem in this region is water pollution and shortage, mainly reflected in six aspects: (a) shrinking area and declining quality of lakes; (b) lower water quantity and quality of rivers, and shortened or disappeared rivers; (c) groundwater level reduction and quality deterioration; (d) increased salinized land; (e) larger deserts, smaller oasis, and more frequent dust storms; and (f) natural vegetation reduction and vegetation degradation. These changes are most evident in the Aral Sea Basin, where the birth rate declines and the infant mortality rate rises due to the deterioration of water quality, and many residents are forced to move under the environmental pressure.

Many countries in South Asia are also facing serious water pollution. In India, for

example, water bodies in many cities are seriously contaminated by domestic sewage, industrial sewage, chemicals, and solid waste. Together with floods and droughts, water pollution has evolved into the major water-related disaster that begins to impede the sustainable development of Indian society. Without insufficient input in the protection of water resources, a large amount of industrial wastewater is discharged directly into rivers, lakes, and underground every day, resulting in large-scale groundwater pollution. The chemical substances contained in the wastewater are far beyond standards, and especially, lead 20 times higher than that of outperforming industrial countries. In addition, the direct discharge of untreated domestic sewage exacerbates water pollution and further threatens public health. The Ganges, the main river flowing through northern India, has been recognized as one of the world's most polluted rivers. The use of contaminated groundwater for drinking and cooking purposes has led to many health problems of local residents, such as diarrhea, hepatitis, typhoid fever, and cholera. At the same time, 12 kinds of soft drinks currently sold in the Indian market have harmful residues beyond national standards, and pesticide residues up to 10-70 times of the European standards.

In Middle East, there is vast desert resulting from critical water scarcity, so the population is mainly concentrated in coastal areas or river basins. Over the two decades, the inherently deficient environment has further deteriorated with large-scale industrialization at a low level of social development, noticeably in oil-producing countries. A variety of contaminants, including highly acidic sulfates and nitrates, not only cause environmental damage in Kuwait, Qatar, Saudi Arabia, Iran, and Iraq, but also pose an environmental threat to other Middle Eastern countries. In addition, the Iran-Iraq war in the 1980s and the Gulf War in early 1990s have brought serious "environmental consequences" to the Persian Gulf Arab region. The massive oil leak with the destruction of oil facilities and tankers contaminated large sea waters and directly endangered the survival of marine fish.

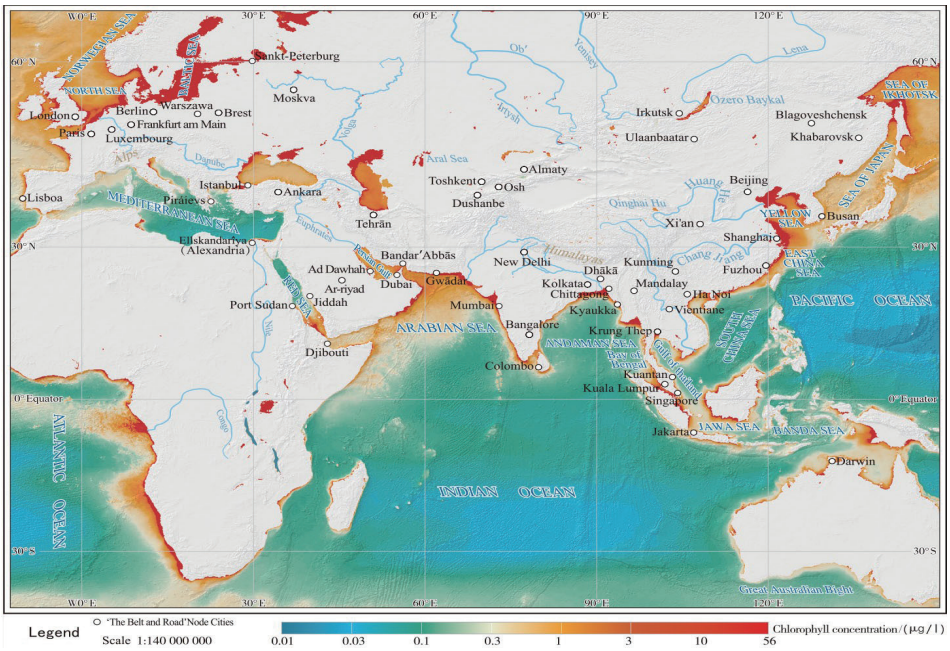
2.3.3 Severe Air Pollution in Countries along the Belt and Road

Air pollution has constraint the development of many countries in the Middle East. In Oman, air pollutants are mainly comprised of sulfide and carbon oxides from oil and gas exploration, transportation and related oil processing industries. The country specifically formulated the Regulations for the Control of Air Pollution from Stationary Sources to curb the growing momentum of air pollution. Iran enters into the rank of worst air polluted countries because of the development of automotive and heavy industries. The economic losses caused by air pollution are estimated to reach 80 billion dollars in 2006, according to the World Bank.

In Mongolia, urban air quality deteriorates more quickly in the process of urbanization. Ulaanbaatar, for example, experiences an increase of exhaust emissions from motor vehicles and power consumption in industrial and construction activities. It is among the world's top five cities of poor performance in air quality, according to the data released by the World Health Organization in 2011.

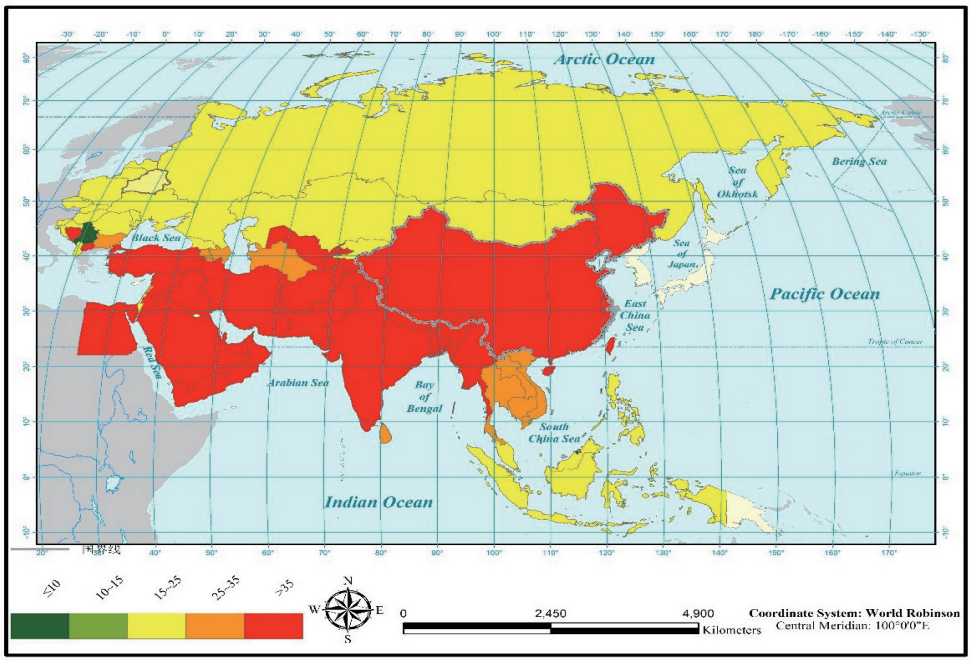
In addition, Eastern Europe suffers serious air pollution from the development of heavy industries and construction of power plants.

Figure 5 Distribution of Average Chlorophyll Concentration in 2003-2014



Source: 2015 Annual Report on Remote Sensing Monitoring of Global Ecological Environment (Belt and Road Ecological Environmental Status).

Figure 6 $PM_{2.5}$ Concentration in the Belt and Road (2015) (Unit: μm/m^3)



2.4 Potential Environmental Risks arising from International Production Capacity Cooperation and Infrastructure Construction

In 2016, China directly invested 14.53 billion US dollars to 53 countries along the Belt and Road, accounting for 8.5% of the total foreign direct investment, and signed contracts worth 126.03 billion US dollars with 61 countries, accounting for 51.6% of newly-signed contractual value. The completed turnover reached 75.97 billion US dollars, representing 47.7% of the total over the same period. "Made in China", "Constructed by China", and "China Service" are welcomed by more and more countries along the route. Meanwhile, products, services, technology, and capital flow to China. However, these large-scale projects and economic development activities to strengthen trade and investment may pose environmental challenges, including such traditional environmental problems as land occupation, soil erosion, water pollution, and air pollution, increased demand for natural resources in population and material flows, biodiversity conservation, and eco-corridor protection.

2.4.1 Infrastructure Construction for Interconnectivity May Undermine Biodiversity

Infrastructure interconnectivity is a priority field for implementing the Belt and Road Initiative. However, linear projects that cross or bypass different ecosystems or sensitive areas, such as roads, railways, and pipelines, may lead to the loss of terrestrial habitat and effect of marginal vegetation, giving rise to marginal microclimate and marginal species. Ecological disturbances will be further widened, and hoofs and local nests will be drastically reduced in the corridor buffer. In this serial evolution, regional landscape patterns and ecosystem structures and functions will be changed obviously.

2.4.2 Long-term Environmental Risks of Mineral Resource Development are Easily Transformed into Economic and Social Risks.

Land resources are seriously destroyed in the development of mineral resources, most commonly mining, in addition to land occupation in the exploration process and by the mining industry and civil construction. Statistics show that mining every 10,000 tons of coal induces 0.2-0.33 ha^2 of surface subsidence on average. Land destruction is more direct and serious in open pits. Mining 10,000 tons of coal needs, on average, to dig about 0.12 ha^2 of land and occupy 0.10 ha^2. In addition, the earth and stone stripped from open-pits, coal gangue from underground mining, horse stone and waste rock from other solid mines, and mineral processing tailings not only occupy a lot of arable land and destroy vegetation and natural landscape, but also cause serious environmental pollution and geological disasters.

2.4.3 Risks are Prominent in the Allocation and Consumption of Water Resources in Projects of International Production Capacity Cooperation

While countries along the Belt and Road generally have inadequate capacity in water resources, the steel, nonferrous metal, and chemical projects mentioned in Guiding Opinions of the State Council on Promoting International Cooperation in Production Capacity and Equipment Manufacturing entail much water consumption. Projects that involve the development and allocation of water resources in international rivers are likely to spark conflicts among countries and regions.

Table 4 Summary of Environmental Criticism on Typical International Projects of Production Capacity Cooperation and Infrastructure Construction

Project	Criticism
Transportation infrastructure	Pollution caused by the use of explosives in nature reserves Deforestation for road construction, which harms the living environment of plants and animals and disrupts animal habitats and migration routes Destruction of the newly-built local irrigation systems and agricultural fields by highway constructed by a Chinese company
Hydropower	Destruction of local natural scenery and iconic cultural heritage
Agriculture	Biodiversity destruction, carbon stock reduction, and potential threats to water resources
Operation (various sectors)	Inappropriate waste disposal, and environmental pollution caused by pollutant leakage

3. BACKGROUND AND SIGNIFICANCE OF PLAN FORMULATION

3.1 Background

3.1.1 China Attaches High Importance to Eco-environmental Protection in Building the Belt and Road

China has been committed to building a green silk road since the inception of the Belt and Road Initiative. In March 2015, the National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce issued the Vision and Actions on Jointly Building the Silk Road Economic Belt and 21st-Century Maritime Silk Road (hereinafter referred to as the Vision and Actions), which made it clear to "promote green and low-carbon infrastructure construction and operation management, taking into full account the impact of climate change on the construction" and "promote ecological progress in conducting investment and trade, increase cooperation in conserving eco-environment, protecting biodiversity, and tackling climate change, and join hands to make the Silk Road an environment-friendly one". In the visit to Uzbekistan on June 22, 2016, Chinese President Xi Jinping called for building a "green, healthy, intelligent and peaceful" silk road, with "green" put in the primary position. He suggested that the partner countries deepen cooperation in environmental protection, intensify ecological preservation and build a green silk road. The 13th Five-Year Plan for Protecting the Ecological Environmental dedicates a chapter to "advance green Belt and Road construction and lists the key tasks in this regard. In the keynote speech at the opening ceremony of Belt and Road Forum for International Cooperation on May 14, 2017, Chinese President Xi Jinping said that "we should pursue the new vision of green development and a way of life and work that is green, low-carbon, circular and sustainable. Efforts should be made to strengthen cooperation in ecological and environmental protection and build a sound ecosystem so as to realize the goals set by the 2030 Agenda for Sustainable Development." He added that "we will set up a big data service platform on ecological and environmental protection. We propose the establishment of an international coalition for green development on the Belt and Road, and we will provide support to related countries in adapting to climate change."

3.1.2 Green Development Becomes the Consensus of the Global Community

In the face of enormous environmental challenges, the international community has firmly determined to jointly deal with environmental issues and reached the consensus of green development. The Paris Agreement sends out a strong signal of green, low-carbon, climate-adaptive and sustainable development. Adopted by the United Nations in September 2015, the 2030 Agenda for Sustainable Development sets out 17 goals and 169 targets, covering poverty and hunger eradication, health,

education, gender equality, water and sanitation, energy, and climate change. It clarifies the requirements and trends of global green development and underlines the importance of environmental issues in global governance.

3.2 Significance

3.2.1 Vigorous Practice to Implement the Concepts of Ecological Progress and Green Development

China has elevated the construction of ecological civilization as a national strategy and included green development into the five principles of development during the 13th Five-Year Plan (FYP) period. Chinese President Xi Jinping repeatedly stressed that "clean waters and green mountains are invaluable assets", "we should adhere to the basic national policy of conserving resources and protecting the environment", and "we should protect the environment like one protects his eyes and treat the environment like one treats his life." Chinese Premier Li Keqiang emphasized in many occasions the need to intensify comprehensive environmental treatment, advance ecological progress, and promote green development, with a determination to step onto the road to win-win of economic development and environmental improvement. Since the 18th National Congress of the Communist Party of China, ecological progress has been placed in a more important strategic position and incorporated into the "five-in-one" overall layout. The Plan draws attention to the principles of ecological progress and green development in the decisions and practices to build the Belt and Road. It calls for joint efforts to build green, prosperous, and friendly Belt and Road by strengthening cooperation on strategic alignment and policy communication in the field of eco-environmental protection in the Silk Road spirit which advocates peace and cooperation, openness and inclusiveness, mutual learning and mutual benefit, and win-win.

3.2.2 Effective Pathway to Realize the Service, Support, and Safeguard of Eco-Environmental Protection

Eco-environmental protection is an important link to serve, support, and safeguard sustainable progress in building the Belt and Road. By formulating and implementing the Plan, China will develop a series of policies in favor of cooperation in eco-environmental protection towards green Belt and Road. It will further improve exchange platforms, strengthen information sharing, expand cooperation in key fields such as pollution control, ecological protection, nuclear and radiation safety, and technological innovation in eco-environmental protection, and carry out a number of major eco-environmental protection projects. This will provide comprehensive service, important support and solid protection for smooth international production capacity cooperation and infrastructure construction.

3.2.3 Explicit Program to Promote Global green Development

Given the complex ecological environment and high resource dependence of economic development, countries along the Belt and Road generally face development-protection

contradictions brought by industrialization and urbanization and have an increasing demand for accelerated transformation and green development. The Plan requires all-round integration of green development into the specific tasks and measures for "policy coordination, infrastructure connectivity, unimpeded trade, financial integration, and people-to-people bond". Keeping pace with the overall trend of global development, the Plan will effectively improve the regional eco-environmental protection capacity by facilitating bypass that harmonizes economic development and environmental protection with minimum impact on the ecological environment.

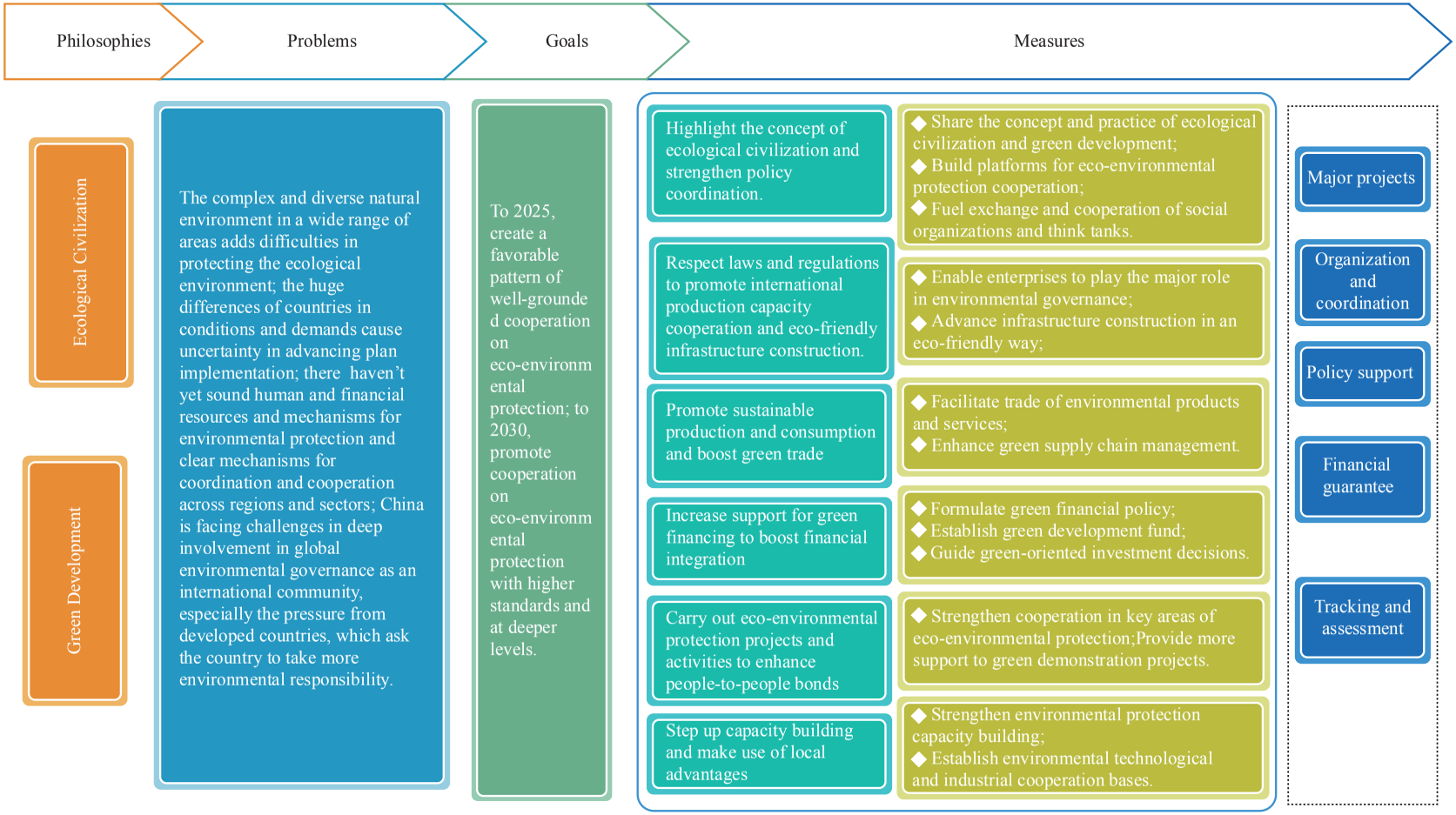


Figure 7 Thought for Plan Formulation

4. FOCUS TASK ANALYSIS

As a special document to promote the Belt and Road cooperation in eco-environmental protection, the Plan further strengthens the role of eco-environmental protection in supporting, serving and safeguarding the Belt and Road construction.

4.1 Overarching Considerations

The comprehensive, macro and strategic Plan holds grip on six priorities towards the specific objective while following two philosophies.

4.1.1 Objective

The objective of the Plan is "to enhance the level of cooperation in eco-environmental protection by deepening and expanding cooperation in key fields such as pollution control, ecological protection, nuclear and radiation safety, technological innovation in eco-environmental protection, in order to make eco-environmental protection more capable of serving, supporting and safeguarding the Belt and Road that will be built into a green, prosperous, and friendly road that benefits countries along the route."

4.1.2 Two Philosophies

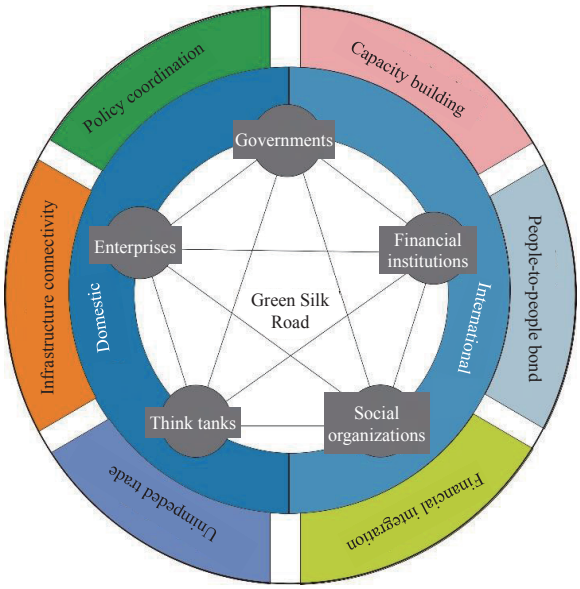
The two philosophies refer to ecological progress and green development. The Plan incorporates the philosophies into all aspects and whole process of the planning and project implementation under the Belt and Road Initiative, thoroughly pursuant to the Vision and Actions, 13th Five-Year Plan for Protecting the Ecological Environment, and Guiding Opinions on Promoting Green Belt and Road Construction. It fully demonstrates China's determination to highlight ecological progress and green development in building the Belt and Road.

4.1.3 Six Priorities

The six priorities are the key tasks to be implemented, including (a) to strengthen policy coordination that reflects the principle of ecological progress; (b) to advance international production capacity cooperation and eco-friendly infrastructure construction with respect for laws and regulations; (c) to promote sustainable production and consumption and boost green trade; (d) to increase support for green finance to boost financial integration; (e) to carry out eco-environmental protection projects and activities to enhance people-to-people bonds; (f) to step up capacity building and make use of local advantages. Among them, the former five tasks serve the connectivity in policy, infrastructure, trade, finance and people in the Belt and Road and the latter task focuses on building the eco-environmental protection capacity of provinces involved in Belt and Road.

The framework of cooperation under the Belt and Road Initiative, as shown in Figure 8, emphasizes cooperation in multiple dimensions, covering governments, enterprises, think tanks, social organizations, and financial institutions, and considering the domestic and international contexts, and identifies the priorities in policy coordination, infrastructure connectivity, unimpeded trade, financial integration, people-to-people bond, and capacity building.

Figure 8 Belt and Road Cooperation Framework for Eco-environmental Protection



4.2 Diverse Participants

Building green Belt and Road involves a wide range of participants who facilitate policy communication, responsibility implementation, technical exchange, financial support, people-to-people interaction, and think tank cooperation, such as governments, enterprises, financial institutions, think tanks, and social organizations. It is no exaggeration to say that, the key to the success of Green Silk Road lies in the active involvement and promotion of these diverse participants. Hence, the Plan emphasizes more capacity building efforts to form an eco-environmental cooperation network that integrates government guidance, business entities, financial institutions, and social participation.

4.2.1 Governments

In addition to strengthening policy coordination, governments should provide guidance and support for enterprises, think tanks, and social organizations involved in building green Belt and Road. First, the Chinese Government has put forward green-oriented requirements for corporate behavior. For example, in 2013, Chinese Ministry of Environmental Protection and Ministry of Commerce issued China's first normative document to encourage and regulate corporate environmental behavior of overseas investors -- Guidelines on Environmental Protection in Foreign Investment and Cooperation. At the International High-level Dialogue on Eco-environmental Cooperation under the Framework of the Belt and Road Initiative held in December 2016, Shenzhen, 16 Chinese enterprises jointly announced the Initiative to Fulfill Corporate Environmental Responsibility and Build Green Belt and Road, aiming to urge enterprises to observe environmental laws and regulations and fulfill environmental responsibilities in overseas investment and business activities for external display of green corporate image. Issued in 2017, the Guiding Opinions on Promoting Green Belt and Road Construction stressed that "we should strengthen guidelines on green corporate behavior and encourage enterprises to take voluntary measures". Pursuant to these documents, the Plan requires enterprises to abide by local environmental regulations and standards and fulfill corporate environmental responsibility. To fuel the exchange and cooperation of think tanks and social organizations, the Plan proposes to increase the involvement of think tanks in strategic development, policy alignment, and investment advisory services and provide the platform for international exchange and

cooperation of social organizations in the field of environmental protection

4.2.2 Enterprises

Enterprises should proactively assume responsibility for environmental governance. The Belt and Road Initiative encourages Chinese enterprises to "go out" and welcomes foreign enterprises to "come in". As are the major player to build green Belt and Road, we should fully stimulate and utilize their enthusiasm and initiative in protecting the ecological environment. The Plan requires enterprises to consciously abide by local environmental regulations and standards, strengthen environmental management, and disclose corporate environmental information by publishing annual environmental reports on a regular basis, so as to promote the green content of international production capacity cooperation and infrastructure construction.

4.2.3 Financial Institutions

Financial institutions should increase the support for green finance. The Plan proposes to study and develop green investment and financing guidelines according to the needs of countries along the Belt and Road, and create a dedicated fund for resource development and environmental protection to support eco-environmental infrastructure construction, capacity building and development projects of green industries in countries along the Belt and Road.

4.2.4Think Tanks and Social Organizations

Think tanks and social organizations are expected to actively participate in building green Belt and Road. These public-welfare and non-profit organizations have more affinity that secures an advantage in the communication and coordination with social groups of different interests and ideas. As a grand vision of regional open cooperation, green Belt and Road construction needs to make use of think tanks and social organizations to bridge businesses and local governments and communities. The Plan puts forward that think tanks and social organizations should play an active role in policy coordination and strategic alignment, including consultation and assistance through contact in various forms, such as public service, joint research, exchange visits, forums and exhibitions.

4.3 Connectivity-oriented Key Tasks

According to the Vision and Actions, we should promote Belt and Road cooperation for connectivity in policy, infrastructure, trade, finance, and people. Eco-environmental protection is considered to serve, support and safeguard the Belt and Road construction. More specifically, it provides information and technical support and maintains essential ecological products and environmental conditions for construction activities, and prevents ecological risks in the construction process to ensure regional environmental security. Therefore, eco-environmental protection should be integrated into the whole process and all aspects of connectivity facilitation. In accordance with the requirements, the Plan sets out the key tasks.

4.3.1 Highlight the Concept of Ecological Civilization and Strengthen Policy Coordination

Policy coordination and strategic alignment is necessary to build green Belt and Road because countries along the route vary widely in the development stage, institutional conditions, industrial facilities,

legal standards, cultural background, and resource and environmental endowments. Exchange and communication should be strengthened through such platforms as high-level government dialogue and international coalition for green development on the Belt and Road. This not only enables China to share the concepts and practices of ecological progress and green development and helps countries and regions along the route to basically align strategies, policies, decisions, and rules. Meanwhile, the exchange seeks consensus on eco-environmental cooperation in order to resolve eco-environmental problems that may arise from the Belt and Road.

4.3.2 Respect Laws and Regulations to Promote International Production Capacity Cooperation and Eco-friendly Infrastructure Construction

International production capacity cooperation and infrastructure construction are the most direct economic activities in building the Belt and Road. Only by avoiding or minimizing the impact of these activities on the local ecological environment in an eco-friendly way, the "governor and conception vessels" of the Belt and Road can truly flow smoothly. Regarding international cooperation in production capacity, enterprises should play a major role in environmental governance and, and consciously abide by local laws, regulations and standards. Regarding infrastructure construction in transportation, building and energy sectors, we should improve green and low-carbon construction, operation and management of infrastructure, especially environmental protection facilities in industrial and trade cooperation zones.

4.3.3 Promote Sustainable Production and Consumption and Boost Green Trade

In 2014-2016, China's trade with countries along the Belt and Road exceeded 3 trillion US dollars and investment 50 billion US dollars according to statistics. While promoting unimpeded trade, the mitigation of environmental impact is critical to the long-term cooperation with countries along the route. The management of import and export trade should give priority to environmental protection, actively explore the feasibility of integrate environment in free trade agreements, facilitate mutual recognition of eco-labeled products, and encourage the imports and exports of environmental goods and services. As green supply chain leverages purchasers to improve environmental performance, China has actively explored regional cooperation in this respect. For example, the Beijing Declaration, announced at the 22nd APEC Economic Leaders' Meeting in 2014, said that the APEC countries "agree to establish the APEC Cooperation Network on Green Supply Chain" as recommended by China. If implemented as a corporate policy in international trade, green supply chain management can inject an impetus to green development of countries and regions along the Belt and Road.

4.3.4 Increase Support for Green Financing to Boost Financial Integration

China has fostered financial cooperation of various forms with countries and organizations involved in building the Belt and Road. For example, the Asian Infrastructure Investment Bank has provided 1.7 billion US dollars in loans to participating countries and the Silk Road Fund has invested 4 billion US dollars. The "16+1" financial cooperation framework

has taken shape. In terms of financing, we should attach importance to the development of green finance and make active efforts to build the artery of green financing. Green financing instruments, such as green development fund and green bonds, can be used to increase support for green Belt and Road construction.

4.3.5 Carry Out Eco-environmental Protection Projects and Activities to Enhance People-to-people Bonds

"Friendship, which derives from close contact between the people, holds the key to sound state-to-state relations." Regarding eco-environmental protection, we should strengthen cooperation in the fields of strength, such as pollution control, ecological protection, nuclear and radiation safety, technological innovation, and compliance with environmental conventions, and improve foreign aid in legal system, personnel exchange, and demonstration projects. Meanwhile, we will implement the Green Silk Road Envoys Program to strengthen the interaction and exchange of environmental management personnel and professional technical personnel, and establish technical cooperation parks and demonstration bases for environmental protection industries. These projects and activities will consolidate mutual understanding and support of the government, business and public, thus creating a favorable atmosphere and laying a solid social foundation for jointly building the Belt and Road.

4.4 Step Up Capacity Building of Cooperation in Eco-environmental Protection

4.4.1 Take into Account the Domestic and International Contexts in the Belt and Road Initiative

"In advancing the Belt and Road Initiative, China will fully leverage the comparative advantages of its various regions, adopt a proactive strategy of further opening-up, strengthen interaction and cooperation among the eastern, western and central regions, and comprehensively improve the openness of the Chinese economy," according to the Vision and Actions. Based on this, specific requirements are raised for the northwest, northeast, southwest, coastal and inland regions, as well as Hong Kong, Macao, and Taiwan. To this end, the Plan prioritizes the capacity building of provinces involved in the Belt and Road Initiative while laying down five key tasks for connectivity.

4.4.2 Strengthen Capacity Building of Domestic Areas along the Belt and Road

Almost all provinces in China have actively planned and presented respective programs since the inception of the Belt and Road Initiative. However, these programs are deficient in reflecting the objectives of green Belt and Road, indicating insufficient emphasis on green strategy by local authorities. Given this, local governments are required to fully understand and grasp the strategic intent of the country to jointly build green Silk Road, and formulate their environmental cooperation planning and implementation program that effectively align with the Plan. China should give full play to the advantages of different regions, strengthen capacity building in environmental regulation and governance, and participate in bilateral and multilateral environmental cooperation in a joint effort to build green Belt and Road through communication and consultation.

4.4.3 Establish Bases for Environmental Technological and Industrial Cooperation where Conditions Permit

China is active in the exchange and promotion of the technologies for air pollution control, water treatment, and solid waste disposal. In 2015, the Environmental Technology Exchange and Transfer Center for the Belt and Road Initiative was set up in Shenzhen. Drawing on Shenzhen's experience, we should fully encourage regions to establish environmental technological and industrial cooperation bases that focus on the development of advanced and superior environmental technologies and industrial resources. Enterprises, organizations and institutions in the relevant regions can be mobilized to coordinate with countries in ASEAN, Central Asia, South Asia, Eastern Europe, Middle East, and Africa. Assistance should be offered to enterprises in services for environmental technology transfer, including financial and human resources and intellectual properties, so as to provide applicable and advanced technological achievements to countries along the route. At the same time, environmental protection industries should be valued, and technological research and development capabilities improved by tapping technological innovation resources in the Yangtze River Economic Belt, Bohai Economic Rim, Pearl River Delta, and Central Plains Urban Agglomeration as underpinning for green Belt and Road.

4.5 Safeguard Measures

While making overarching design and guidance, the Plan gives prominence to the practicability of specific objectives and tasks. Focusing on six key tasks, the Plan designs major projects and stipulates policy support and financial input.

In order to ensure efficient implementation, the Plan requires departments to improve policy measures and support services and participants to contribute to coordinated progress according to the division of labor, involving government departments, central and local governments, enterprises and the public. Timely Monitoring and assessment will be conducted in a timely manner to address new conditions and new problems, and ensure that the Plan achieves desired results in support of green Belt and Road Initiative.

The Plan is an important outcome of building green Belt and Road. The better implementation and performance necessitates strategic integration by strengthening comprehensive policy alignment and coordination with countries and regions along the Belt and Road.

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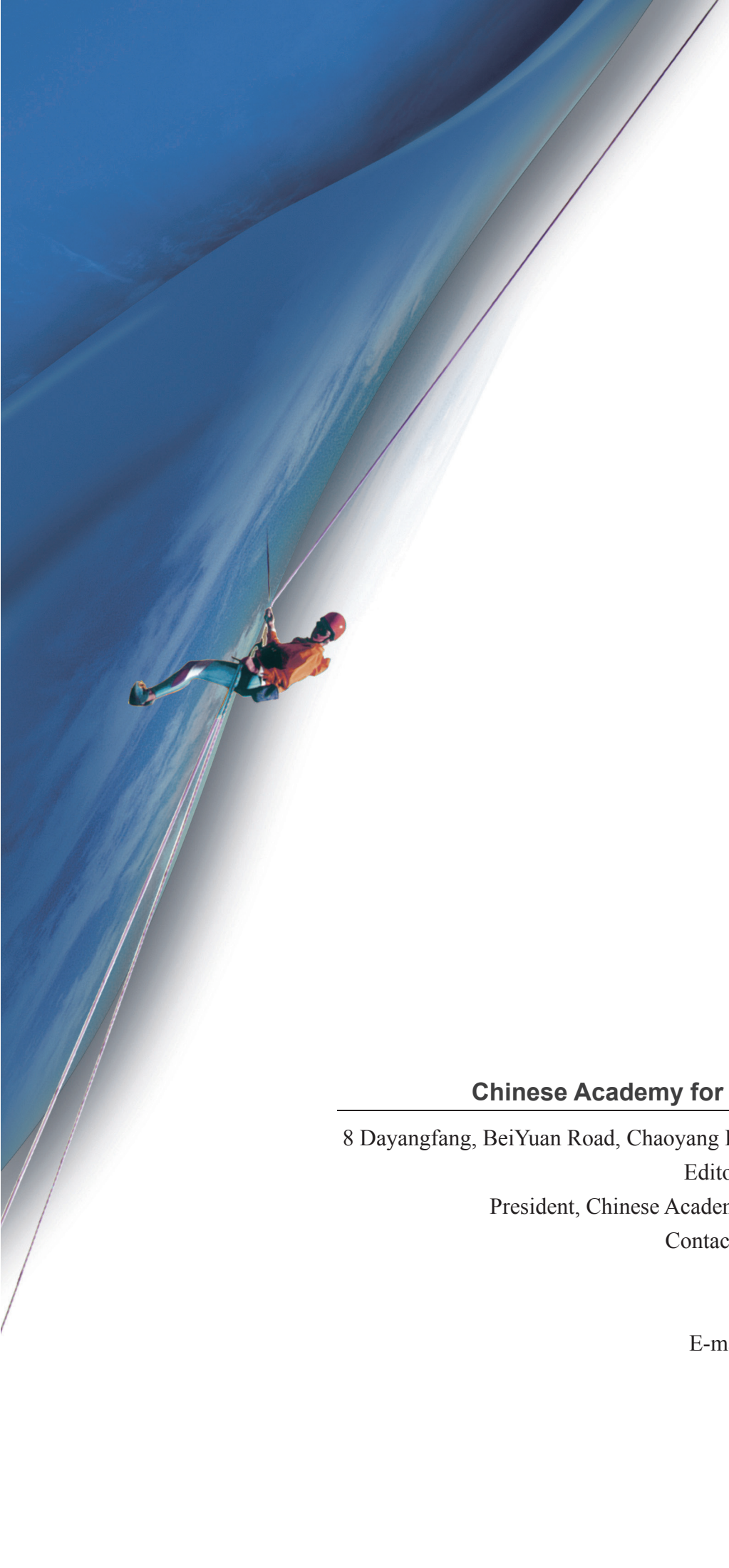

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