Greening the Belt and Road Projects in Central Asia

A Visual Synthesis





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A preliminary version was presented to the participants of the Torino international training on sustainable infrastructure (October 2018, Italy), where the experience and insights of Central Asian participants informed this final report. This report is an illustrated overview of the Belt and Road developments in Central Asia. The information comes from official and research sources, from media accounts and from interviews with key actors. While the report strives to maintain high research standards, it presents the scientific and technical material in a manner accessible to lay readers.

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Introduction

The official launch of the Belt and Road Initiative (BRI) in 2013 ushered in a period of remarkable transformations in Central Asia. The development of new regional transit corridors and the modernization of telecommunications networks are connecting the people in the region to each other and to the rest of the world. Chinese investments and technologies provide Central Asia countries with the opportunity to leapfrog some intermediate steps in the development of their infrastructure and economy, and to expand their regional trade and transportation networks.

For the five countries of Central Asia – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – the Belt and Road Initiative and the associated Chinese investments are synonymous with a new era of political and economic relations. This report considers the interests of the Belt and Road participants, and examines the implications of Belt and Road projects for the environment and for the prospects for sustainable development in the region. Azerbaijan connects Central Asia via the Caspian Sea to Europe and the Middle East, and this report covers Azerbaijan, albeit to a lesser extent than the five countries of Central Asia.

The rise of a green economy and the further pursuit of good governance are necessary steps for successful long-term sustainable development in Central Asia. The greening of the energy, transportation and agriculture sectors confers environmental benefits, and may give the countries a competitive advantage. China and its partners express their willingness to make Belt and Road developments mutually beneficial and greener, but some countries in other regions have suspended or questioned large infrastructure projects after weighing the socioeconomic costs and the longterm environmental consequences (FT 2019, IFC 2018, CD 2019, Reuters 2019). Advocates and promoters are active in Belt and Road projects as are opponents, observers and monitors. Among those with strong interests are large Chinese state-owned enterprises, international organizations and unions, and lobbyists from across the spectrum of sectors affected by developments.

At the request of the Chinese government, UN Environment (UNEP) actively contributed to conceptualising and creating an international platform lead by Ministry of Ecology and Environment of China that aims to bring together stakeholders from government, the corporate sector, NGOs, academia, and international organisations, to pursue joint efforts in greening the Belt and Road projects¹. Together with the International Labour Organization, UN Environment conducted comprehensive training for representatives of the five countries of Central Asia in Turin, Italy, in October 2018 (UNEP 2018). Publications on global, regional and thematic subjects related to the Belt and Road Initiative are growing in number and diversity. Based on original research and the ongoing screening of documents, news and projects, this report provides a narrative and visual synthesis of the Belt and Road Initiative in Central Asia.

As a February 2019 World Bank (WB 2019) conference on the Belt and Road noted, "One of the constraints to good analytical work is that no comprehensive dataset exists with reliable information about Belt and Road Initiative project costs, conditions and terms of financing." The production of this visual synthesis faced similar constraints, including scarcity of data on the Belt and Road Initiative environmental footprint, impacts and project performance, but the material presented here covers as much as the authors feel is needed for non-specialists to understand the rapid developments of the Belt and Road in Central Asia and their links with environmental trends and outlooks. Further regular updates and expansion of this work is welcome.



The Big Picture

China's definition of the scope of the Belt and Road consists of the Silk Road Economic Belt and Twenty-first Century Maritime Silk Road. In a 2015 statement of its vision for the Belt and Road, the Chinese government lays out the country's BRI ambitions: "The Belt and Road Initiative aims to promote the connectivity of Asian, European and African continents and their adjacent seas, establish and strengthen partnerships among the countries along the Belt and Road ... and realize diversified, independbalanced ent, and sustainable development in these countries." (NDRC PRC 2015). Since its inception, the geographic coverage of the BRI diversified and expanded.

One of the marine routes extends to the Arctic Ocean - where global warming is melting sea ice and opening waters to shipping. This prospect is also opening cooperation between Russia and China on the development of arctic transport, liquefied natural gas and metals production and deliveries to China. An Indian Ocean marine route connects China to Africa, the Middle East and on to Europe, while a Southern Pacific route connects China with the Americas and Oceania.



Arctic Ocean



NEW SILK ROAD



The inland belt reimagines the Silk Road with dry ports and road and rail links. The speed of transport associated with these new ports and links will enable the landlocked countries of Central Asia to become economically competitive with those using marine routes. The inland route will be faster and shorter than the marine. The increased speed will also allow for the shipping of time-sensitive products such as food and medicines. Beyond Central Asia, the Belt and Road Initiative is active in Pakistan, South-East Asia and in many countries of Africa, and increasingly in the Middle East, South America and Eastern Europe.

China's rise on the global stage and its volume in international trade and manufacturing is changing the patterns of business and trade in Central Asia. Russia is a long-standing partner of Central Asia countries in security, trade in agricultural products and commodities, energy and labour (guest workers and remittances). But in recent years, foreign investment and infrastructure development projects increasingly have come not from Russia or the West, but from China, and political relations are changing in the region in concert with economic ties and trade.

The transformation of China over the past 40 years coincided with turbulent transitions in the post-Soviet countries, and two decades ago China's economic, cultural and political and infrastructure connections with Central Asia and Russia were limited. Now China is increasingly connected to Central Asia by pipelines, roads and other infrastructure, and has developed business links in energy, minerals and the transit of goods to Europe. Tourism, agriculture, healthcare and education are emerging as new areas of cooperation. Central Asia is benefiting from new domestic and regional roads, technologies, trade and sources of financing. Enhanced trade, connectivity and investments might translate into higher economic growth and poverty reduction across Central Asia. At the same time, some countries may face the risk of excessive debt and poor quality projects with socio-environmental risks. So, the main question is how to maximize the benefits and minimize the risks (WB 2019).

construction

The Economic Cooperation Organization connects Central Asia to Afghanistan, Pakistan, Iran, Azerbaijan and Turkey, and counts Russia and China as essential trading partners. The Eurasian Economic Union of Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia allows cargo to pass through just two customs points on the way from Xinjiang – China's west (one of the underdeveloped domestic priority regions) – to the EU's neighborhood in Central and Eastern Europe and the Baltic. The BRI connectivity aligns with Kazakh and Russian interests in improving their transit and export potential. Kazakhstan stands to receive a potential US \$5 billion annually in transit fees from goods moving through it to other markets (EMF 2019).

The China–Pakistan Economic Corridor provides an early example of how the Belt and Road Initiative is intended to work – diverse investments and partners together with the applications of Chinese technology developed a network of connections between Pakistan and China. Pakistan has planned more BRI projects than any other country so far – bridges, roads, power plants, IT and communications, ports and railways – valued at more than US \$60 billion (SCMP 2018). In Pakistan, Uzbekistan and Russia, the Silk Road Fund of China, acting as one of the key BRI financial mechanisms, is supporting investments in the energy sector.

China's former western hinterland - the Xinjiang-Uyghur Autonomous Province bordering Kazakhstan, Kyrgyzstan and Tajikistan - is now a booming centre of traditional and renewable energy, technology and commerce, and its capital, Urumqi, has become the largest city in greater Central Asia. While many socioeconomic projects occurred independently or were initiated prior to the unveiling of the Belt and Road, this grand initiative undoubtedly provided a major boost and political-economic backing and framework for the development both within China and in Central Asia. The greening of the Belt and Road routes is literally happening across the Taklamakan desert, where many kilometres of important roads are protected from sand storms by shelter belts. At the same time, rapid changes occurring in this region and tightening of security, in part due to the growing importance of infrastructure, are triggering tectonic shifts in local lifestyles of diverse ethno-cultural groups, traditions and connections.

The economies of Central Asia have been growing over the last 15 years as a result of increased agricultural and industrial production, expansion of services and trade, and favourable markets for raw materials. This growth comes in part as a result of several developments – the expansion of trade and infrastructure, Chinese investments, new opportunities under the Central Asia Regional Economic Cooperation programme and other initiatives promoted by multilateral development banks, and more recently the Belt and Road. Chinese culture and language are becoming popular among young people and traders who plan to develop business connections and participate in China-linked projects in Central Asia.



Tarim Desert Highway in Taklamakan Desert, China © Shutterstock

Environmental Stakes in Central Asia

Vast steppes and deserts, dramatic peaks and massive glaciers characterize the landscape of Central Asia. Two of Asia's mountain ranges – the Pamirs in Tajikistan and the Tien Shan, mainly in Kyrgyzstan – make those countries the most mountainous in the region, with an average elevation of about 3 000 metres and peaks exceeding 7 000 metres.

TURKEY

Yerevan a

Baku

AZERBADAN

Avaza

World cultural heritage sites and tourism attractions dot the ancient Silk Route, and the region has substantially increased the size and type of protected natural areas (CBD 2019), including recent world natural heritage site nominations in the Pamir (Tajik National Park), Western Tien-Shan and Chinese Tien-Shan mountains, and in the central steppes of Kazakhstan (UNESCO WHC 2019). Participatory mapping and consultations on the new candidate sites to the world natural heritage list is ongoing (IUCN 2019). Central Asia's cultural and natural endowments are rich and diverse, but global changes and local human interference threaten the region's natural treasures, and the prospects for the fragmentation of ecosystems and the disappearance of species cast shadows over otherwise beneficial development.

Itchan Kala

Bukhara

UZBEKISTAN

TURKMENISTAN

Nisa Ashgabat

Merv

Kunya-Urgench

RUSSIA

Mashad

IRAN





2018). Between 1976 and 2017 the most rapid growth in average annual temperatures occurred near the Caspian Sea and inland areas. Temperature increases for the region are most marked in the spring. In the Caspian region and across Turkmenistan and Uzbekistan, summer temperatures have increased significantly. Southern dryland areas of Central Asia have experienced declining precipitation in contrast to some increases in the mountains (NECC 2018).

In both Tajikistan and Kyrgyzstan glaciers cover more area than forests do, contain an unfathomable amount of frozen water and are crucial to the agricultural economy. Glaciers provide water in the hottest and driest periods of the year and compensate for low precipitation. In the time since instrumental observations began in the 1930s–1950s, between 15 per cent and 30 per cent of the Tien Shan



and Pamir glaciers have melted (UNFCCC 2014-2018, CAWA 2014-2018, NYT 2019). Small glaciers at low elevations were hardest hit. Melting of frozen rocks and glaciers at high elevations create risks for mining, roads and other infrastructure, and for people in settlements. For now, the region's water supply is still sufficient. Melting glaciers are actually shedding more water and peak flow in the glacier-fed basins of Central Asia is expected to occur by 2030–2050 (Huss and Hock 2018). Rivers relying on rain and snow, however, are increasingly at risk of water shortages, especially in southern parts of the region. Chinese and Central Asian scientists cooperate with Western and Russian scientists in field studies and modelling of glaciers and climate change to inform authorities and the public about the observed trends and plausible future scenarios.

Under likely climate change scenarios for Central Asia, average temperatures are expected to increase by 1°C–3°C by the middle or end of this century, and, if the global greenhouse gas emissions go unmitigated, could rise even more (UNFCCC 2014-2018, CAWA 20142018). Scientists indicate that climate change may reduce precipitation in southern parts of Central Asia (UNFCCC 2014-2018, CAWA 2014-2018). The precise local impact these weather changes may have is unknown. But the growing intensity of precipitation is becoming a problem in traditionally dry zones of southern Central Asia. In Ashgabat and other locations, for example, locally intense rainfalls caused major flooding in 2018 and 2019. Flooding risk in northern Kazakhstan is also growing due to the combination of a rapid warming, ice-snow conditions and precipitation in the spring (RECCA 2019).

Climate-induced extreme weather can put livelihoods and food production at risk, which in turn can push people to migrate or lead to increased social stress. Climate impacts on energy production can put supply chains and energy security at risk. Increasing demand for water and an unreliable supply due to vanishing glaciers complicate water governance. The situation in the mountains as well as in densely populated areas and the southern border regions of Central Asia, warrant ongoing attention.

OTHER ENVIRONMENTAL PRESSURES



A majority of rural populations in Central Asia practice some form of agriculture – cultivating cereals, cotton and vegetables; gardening; collecting forest products; and grazing livestock on a wide range of pastures in steppes, deserts and mountains. Overgrazing and the collection of bush and wood have exposed many areas to a high risk of desertification, and the growth in rain-fed cultivation in the mountains has increased the risk of soil erosion.

Long-term leases of land resources improved the sense of ownership, but the potential for local conflicts over pasture, forest, land and water use has increased, too. Across Central Asia, local

and central authorities along with non-governmental and international organizations and land and water user associations have worked successfully to reduce local anxieties. The increasing interest of Chinese businesses in agricultural exports and land leases in Central Asia call for the services of experienced managers and increased transparency to mini-



mize uneasiness or fears related to these interests.

Water is a vital resource, but land is both a key asset and a deeply rooted, ancestral, almost sacred, possession. The proposed land legislation revisions in Kazakhstan in 2016 contemplating an option of long-term land leases to foreign actors were put on hold after a series of protests (Reuters 2016).

Abandoned mines, hazardous industrial and agricultural waste sites and mine tailings – mostly legacies of the Soviet period – continue to be a major environmental concern across Central Asia, especially in Kazakhstan, Kyrgyzstan and Tajikistan. When the Soviets left, they abandoned the mines, tailings and obsolete pesticides with little or no remediation. These hazardous sites remain obstacles to development, and continue to pose risks to the environment and the people. State and donor funding supported numerous costly environmental rehabilitation projects, but many

sites are still waiting for remediation plans and the funding to implement them. Mining projects associated with the Belt and Road Initiative need to consider these lessons; follow both domestic and international environment, health and safety guidelines (IFC EHS 2019); and take into account UN Environment Assembly decisions (UNEA 2019) on mineral resource governance, sustainable infrastructure and other relevant resolutions

and toolkits.

TUTUTION

Air and water pollution from industrial sources are not major environmental issues in Central Asia except in some cities. Road traffic and residential heating are now the major factors undermining urban air quality. Large cities located in close proximity to mountains, including Almaty, Bishkek, Dushanbe and Urumqi all experience winter temperature inversions that compound



the effects of air pollution. Better traffic regulation, improved design of heating and energy systems and development of public transport along with the introduction of electric vehicles and higher fuel standards all can help reduce smog, improve the quality of life and attract businesses to the Silk Road cities.

In light of ongoing energy imbalances, including the high reliance on a dominant source, countries continue to work on their energy security through diversification of suppliers and by considering coal and nuclear power. These measures enhance energy security, but increase climate impacts and generate



waste. The expansion of renewable energy sources can lower emissions, but the current balance of Belt and Road energy projects in Central Asia tilts toward coal, oil and gas rather than renewables in terms of investment volumes and energy capacities. Other international energy investors are devoting more resources to the traditional and large-scale energy and nuclear power systems (in Uzbekistan) than to renewables.

Many populated areas in the region, especially the mountain areas, are at risk from extreme weather, flooding, earthquakes and landslides, and the current measures to prevent accidents involving industrial facilities and power plants are inadequate. In Tajikistan and Kyrgyzstan, average annual economic losses from natural disasters reach 1-2 per cent of GDP and in some years up to 5 per cent of GDP (GFDRR WB 2015). With the expansion of Belt and Road investment projects into mountains and densely populated areas, disaster risks need to be carefully examined, and the proposed solutions should be environmentally and technically sound. Development and maintenance of infrastructure in disaster-prone areas tends to be more expensive, and some modern mountain roads are under risk of snow avalanches and rock instability. Critical infrastructure in the steppes and deserts is subject to snow storms and flooding. Additional on-site measures and customized hydrometeorological services are needed to enhance infrastructure safety and functionality.



WATER

The dramatic fate of the Aral Sea, once the size of Switzerland and now one fourth of that, is a painful reminder of how the mismanagement of resources – in this case the rapid and massive use of water for irrigation – can lead to natural and humanitarian crises. Other water ecosystems in Central Asia are also under significant environmental stress: Kyrgyzstan's Lake Issyk-Kul fisheries have collapsed, and riparian forests across the region have been fragmented or compromised by agricultural and mining activities (Zoï 2012). While some water withdrawals and other pressures on water are declining, water ecosystems in the region are still at risk from pollution, fragmentation and overuse. Contrary to Central Asia trends, industrial and agricultural projects in western China are increasing water diversions (SIC ICWC 2018, Kukeyeva et al 2018, Diplomat 2018).

Water is arguably the most geopolitically sensitive shared natural resource in Central Asia. Uzbekistan, with the largest population in the region and extensive irrigated agriculture, is the biggest water consumer. With 90 per cent of their water resources coming from mountains located outside their borders, Uzbekistan and Turkmenistan are highly vulnerable to water shortages, especially

their downstream communities. Upstream hydropower projects and water regulation in Tajikistan and Kyrgyzstan were hot topics over the last two decades. Recently with the new political establishment and socioeconomic reforms in Uzbekistan, regional relations are improving and water-energy debates are fading. China and Kazakhstan share the IIi and Irtysh rivers. Two factors are creating uncertainties about the flow and quality of water in these rivers – actual and planned upstream water diversions in China to serve economic projects, growing cities and industries, and the impacts of climate change on the hydrological cycle and extreme events. Both countries will benefit from a continued and comprehensive exchange of information on water formation and use.

By 2050 the population in Central Asia is expected to grow by 18 million people to a total of 90 million. Western China and northern Afghanistan are likely to see population growth of 8–12 million people. These demographic trends along with advances in trade, growing energy and food production and climate change effects on hydrology may have implications on water availability, quality and security.

RUSSIA

THREATS TO BIODIVERSITY

Parts of Central Asia are considered global hotspots for biological diversity and source areas for crop wild relatives. About 150 key biodiversity areas crucial to the maintenance of unique or endangered species have been recently identified in the mountains of Central Asia, including the Chinese and Central Asian sections of Tien Shan and Pamirs (CEPF and Zoï 2017). The number of crop and animal species that originated or diversified in Central Asia and Western China is impressive: apples, pears, almonds, walnuts, pistachios, tulips, as well as horses, goats and yaks. Ten to twenty years ago, the populations of many endangered species in Central Asia were declining or were dangerously low as a result of poaching, overuse and the depletion of their ecosystems. Due to reduced pressures in the post-Soviet era and thanks to the efforts of governments, communities and non-governmental organizations, populations of some animal species have recovered (CEPF and Zoï 2017, IUCN Red List).

Port Kuryk

IRAN

AZERBAIJAN

Baku

Turkmenbashi

Threats to sensitive biodiversity are still present, however, and ecosystems remain vulnerable. Rapid spatial analysis conducted by WWF (WWF 2017) of the proposed BRI economic corridors in Eurasia show that mountainous and desert zones of Central Asia are subject to moderate potential impacts.

EORGIA

Yerevan

AER

TURKEY

Higher levels of trade and globalization and increasing participation in global and regional agricultural markets and connectivity are potentially making Central Asia's rich agricultural biodiversity more vulnerable to the introduction of invasive species and to land use changes made to accommodate untested new crop varieties. No alarming concerns or trends have yet emerged in Central Asia, but dramatic examples from other parts of the world – where forests or other valuable ecosystems were cleared and converted to plantations – should serve as cautionary tales for local farmers and policymakers. TURKMENISTAN

Bukhara

UZBEKISTAN

Chino Central Asta Economic Corridor

<u>Ashgabat</u>

Mashad



RUSSIA

157

Not so long ago, invasive species and overuse damaged Caspian Sea and Lake Issyk-Kul ecosystems, and wild apple forests in Kazakhstan are at risk of bacterial blight outbreaks (Djaimurzina et al 2014). Research on the prevention and minimization of risks from diseases, invasive species, and untested varieties, together with phyto-sanitary controls and exchanges of information, are among the measures that could be practiced or strengthened as the local and cross-border Belt and Road projects and transits progress.

New railways and highways can become major obstacles to the movements of roaming species, and can fragment and reduce their natural habitats. In other circumstances the infrastructure itself may be less relevant in terms of environmental disturbances than the secondary effects and implications – increased access for mining, hunting and the harvesting of plants, and increases in travel and tourism.

GEORGIA

TURKEY

Yerevan

RMENIA AZERBAIJAN

<u>Baku</u>

Conservation groups working hard at species recovery are having encouraging results, but the effects of these new pressures are not well understood. Inadequate staffing levels, limited monitoring and difficult or vast terrain render the enforcement of environmental controls less effective, and enforcement efforts are not keeping up with the rapid pace of development. UZBEKISTAN

Bukhara

TURKMENISTAN

<u>Ashqabat</u>

Mashad

IRAN





Saiga antelope (IUCN Red List category: critically endangered species)



In addition to human factors mass die-offs of antelopes can be triggered by environmental and weather factors. In 2015 up to 200 thousand animals perished.

In the flatlands – especially in the grasslands where migratory species roam across great expanses – the road and rail infrastructure disrupts migratory processes and creates dangers for animals on the move. In these areas, the preservation of animal corridors – including the construction of overpasses and tunnels – is an established technique for species protection (CMS 2014), and may be a crucial design element in Belt and Road projects. Where these projects lead to additional development, additional precautions may be necessary.

Three major Belt and Road corridors through Central Asia will run across mountains that are home to globally important species, and given the high biodiversity of mountain ecosystems, caution is in order. The identification and mapping of key biodiversity areas, using the global standard (IUCN, 2016), is a powerful analytical approach that can provide the framework for the protection of priority sensitive areas.

Still, China's use of best available environmental technologies is rather limited in Central Asia, and information on environmental vulnerabilities and crucial natural areas in Central Asia is often fragmented or accessible only to specialists. The rapid pace of planning and implementation of Belt and Road projects may not allow enough time for public consultations or the consideration of alternatives.

China is investing significantly in training and research in Central Asia via the Academy of Science and university channels, but less so in environmental instruments, standards, safeguards and policy-related environmental information exchanges in the region. Consequently, whatever environmental success China enjoys at home may not translate to equivalent success in Central Asia.

In a high-level statement delivered to the April 2019 Second Belt and Road Forum for International Cooperation, the President of Tajikistan summarized the common environmental concerns and priorities of the BRI recipients to address the issues of climate change and natural disasters, clean energy, special circumstances of the mountain countries and conservation of unique biodiversity (Rakhmon 2019). At this forum, China expressed its readiness to pursue green investments and infrastructure projects, and to provide green financing in a transparent way (Xi Jinping. 2019).



Vestern Europe-Weste China Expressway

Mapping Belt and Road Projects

Monitoring groups from the environmental, energy and various economic sectors are beginning to map Belt and Road investments within their areas of concern. This outside interest is good for the initiative, but the information is limited, and the level of detail in the maps and reports is insufficient for comprehensive assessments. Opportunities for collaboration are abundant where the combination of sector and interest group information, supplemented by relevant databases, can lead to more detailed analyses.

The Belt and Road point projects – as opposed to the linear roads and rails –

Tbilisi

GEORGIA

TURKEY

range from infrastructure

developments such as power plants, refineries and mining sites to agricultural areas and free economic zones with strong potential for trade with China. These projects are concentrated in populated areas, near mineral and energy resources, and in strategic spots for the development of dry ports and logistical hubs.

> About 100 active projects in Central Asia and Azerbaijan are directly or indirectly linked to the Belt and Road Initiative, as identified during the preparation of this visual synthesis in 2018-2019. The projects have a broad range of financing levels, geographic extent and importance – from continental and international transit projects to strategic multimillion domestic energy and transport projects to local urban, agriculture, construction and mining projects.

> > Kuwait City

KUWAIT

Aktobemunaigas

0

Atyrau

0

0

Port Kuryk

Aktau 🖸

A AZERBAIJAN

Alvat

Turkmenbashy

Tehran

TURKMENISTAN

<u>Ashqabat</u>

0

Mashad

IRAN

AN

Bagtyyarlyk Mubarek and Shurtan

Turkmenaba

Galkynysh

UZBEKISTAN

Bukhara

Kostanai



While some China-funded projects in Central Asia are explicitly linked to or positioned as Belt and Road Initiative projects, many are not. Chinese contractors are competitive, professional and can work under the framework of projects funded by multilateral development banks or the private sector. Belt and Road investments often come as all-in-one engineering designs and construction works, and mining, energy or other projects using advanced technologies come with management, operations and maintenance as well.

Most of the BRI projects in Central Asia are related to transport and energy infrastructure. Investments in coal projects are equal to or greater than investments in renewables. Other projects focus on industrial development, information technologies and support for science and education. Among BRI-associated projects is a Chinese grant to Tajikistan that involves construction plans for new governmental buildings, and participation in the construction of a cultural tourism complex in Samarkand, Uzbekistan, to celebrate the ancient Silk Road history and to promote modern destinations.

New technologies that produce more reliable roads and new tunnels that provide communities with year-round access and reduce commuting time – in some cases by as much as

NE

KTZE - Khorgos Gateway

KTZE - Khorgos Gateway

KTZE - Khorgos Gateway

ry port in Khorgos, Kazakhstan

Alamy Photo

half – are dramatic improvements. Only two decades ago the most isolated and impoverished countries of Central Asia – Tajikistan and Kyrgyzstan – were literally separated into several isolated parts due to lack of year-round roads and alternative routes. Similarly, the energy sector had nonexistent north-south power transmission (independent) networks in both countries. Chinese investment closed many of the gaps and expanded the systems. Mutual interests in large investments include an Uzbekistan–Kyrgyzstan–China railroad, and development of hydropower, minerals and energy production and transit.

Kazakhstan is the regional leader in mineral production and processing, while Uzbekistan is a top-ten global gold producer, but most of their mining projects are located in remote semi-desert areas and Chinese extractive business is not extensive in either country yet. Mining and metallurgy industries are the major sources of income, contributing over 50 per cent of the national export earnings in Tajikistan and up to 30 per cent in Kyrgyzstan. Kyrgyzstan has a mix of local, Russian, Chinese and Western partners. Tajikistan, in contrast, is mainly relying on Chinese investments and mining technologies. Chinese interests and investments in the mining and metallurgy projects in Kazakhstan

and Uzbekistan are growing.

NO.1







Perhaps the most emblematic of all Belt and Road projects in Central Asia is the Khorgos dry port, on the border of China and Kazakhstan. This project connects Kazakhstan and Eurasia with China via an ultra-modern logistical hub of railroads and roads, a free economic zone and trade pavilions. New cities and industries are quickly growing around Khorgos. In the next 10 years, millions of containers will be shipped through this dry port with destinations spread across Central Asia, Europe, Russia and the Middle East. Other smaller logistical hubs and free economic zones are being established in the region.

KAZAKHSTAN

Almaty

Urumgi

Khorgos

CHINA

The new Kazakh city of Nurkent, close to the Khorgos dry port on the border with China, arose from nothing to meet BRI development needs. The current population of about 3 000 is expected to grow to 100 000 in the coming 20–30 years. More cities of this type are likely to appear as new logistical and other needs arise.

ASPIRATIONS AND COMPLICATIONS

The Belt and Road Initiative speaks to Central Asia aspirations to connect to Europe, the Persian Gulf, and the Indian and Pacific Oceans. The region's strategic transport and energy corridors support the opportunities to make China a new destination for Central Asian exports: for Turkmenistan – natural gas; for Kyrgyzstan and Tajikistan – metals and ores, hides, and products related to natural resources; for Kazakhstan – oil, gas, metals, uranium, chemicals and wheat; for Uzbekistan – gas, metals, chemicals, and fruits and vegetables. Azerbaijan stands to benefit from the Trans-Caspian International Transit Route, and Kazakhstan from the developments of the Khorgos dry port and the Kuryk marine port.

Central Asia currently imports from China mostly electronics, clothing and construction materials, and exports primarily energy and minerals. These exports, however, do not add much to local employment because the industries require relatively small numbers of employees and because there are Chinese workers in Central Asia mining and energy projects. In the context of China's total trade, Central Asia is a small partner, but imports and exports are expanding (OEC 2013-2017). In China's view, building relationships with Central Asia, a region historically connected to Russia, opens the prospects for developing an important transit route, and for greater access to the region's rich mineral and energy resources. Growing and importing food from Central Asia is a developing interest.

Dietary preferences in China are shifting to more diverse, healthier and higher quality food, and continued urbanization and rising incomes are increasing food demand (NG 2018). Central Asia, with its famously high quality of vegetables, nuts, fruits and meats, is well positioned to take advantage of the opportunity presented by this demand (WB CAEWDP). The improving infrastructure and the opening of Chinese markets to Central Asia food exports offers Central Asian farmers and governments the chance to promote agricultural diversification for a waiting market.

Thanks to railroad and road connections, Kazakhstan is already an active food exporter to China, with annual exports in excess of US \$100 million, though certain challenges remain in phyto-sanitary controls and logistics. Recently Uzbekistan got the green light from China for food exports in addition to fiber exports, but other countries still have limited agricultural exports to China. The main constraints

are underdeveloped road connections, cumbersome customs and limited export promotion efforts, plus technical challenges related to cold storage, inefficient irrigation and productivity. Among the potential exports are grapes, apricots, plums, walnuts and cherries. Some Belt and Road projects are on a fast track and may not allow for sufficient time to conduct thorough participatory socio-environmental assessments. The rapid pace of developments may result in less effective local consultations and missed opportunities for selecting the best available technologies, and stakeholders may reserve their support out of concerns for unknowns and a lack of transparency. While socio-environmental impact assessments are obligatory in all Central Asia countries, the pressure to move forward may compromise the rigour and transparency of the assessment process.

Comparing BRI's environmental implications to business-as-usual scenarios or to the past can be tricky. The calculation of the costs and risks associated with poverty, the inaccessibility of remote villages, deforestation due to lack of energy, the Soviet-era levels of excessive water withdrawals for crop cultivation and irresponsible mining without remediation is a daunting task. Likewise, the costs and risks associated with energy security investments that increase GHG emissions, road and rail network expansions that could lead to fragmentation of ecosystems, and cash-generating extractive industries based on modern technologies without so-cio-environmental due diligence also defy easy calculation. Comparisons based on such analyses are bound to raise as many questions as they answer.

Central Asia countries are also seeking the development of rail systems both for transport independence and for international trade. Transit countries – those between trading partners – stand to benefit from China's growing importance. At present, only Kazakhstan has rail connections to China and is working to expand the transit capacities across the Caspian Sea. Both Kyrgyzstan and Tajikistan are discussing the possibilities of rail connections with China, but financial and technical uncertainties persist. The cost of a railroad from China through Kyrgyzstan to the Ferghana Valley in Uzbekistan – between 270 and 300 kilometres in length – is estimated at US \$3 billion. How to finance such large project and which dimension of the rail tracks – Chinese (and Western European) or the Soviet track already in place in Central Asia – are among the open questions. Establishing connections to China can be a game changer. Twenty years ago, the opening of roads from Kyrgyzstan to China, in combination with attractive local conditions with regard to taxes, customs and trade regulations, led to the development of the Dordoi market in Bishkek (in northern Kyrgyzstan) and Kara-Suu in Osh (in the south). With total area up to 100 hectares, these two markets boast more than 15 000 containers and trading outlets, and have become the largest bazaars of Central Asia. The local employment generated by the markets is hard to estimate, but probably exceeded 50 000 jobs in the peak years with turnover surpassing US \$4–\$8 billion per year. After Kyrgyzstan joined the Eurasian Economic Union (and the related Customs Union), trade patterns shifted.

The success of the Dordoi and Kara-Suu markets and the increased trade have boosted Kyrgyzstan's textile industry, which employs about 45 000 workers officially and about 250 000 informally, mostly women, in the production of clothing, carpets and other products. The Kyrgyz export strategy 2019–2022 (KG 2018) identifies clothing as the country's number one export priority. The industry's monetary value is not particularly high – in the range of US \$120–300 million per year – but it is a significant local employer.

With improving regional relations and connectivity, both Tajikistan and Uzbekistan have initiated substantial expansions of orchards and vegetables to diversify and increase the potential for agricultural exports to supply markets in Russia and prospectively in China.

Decisions on extractive industries or exploration of minerals and energy are sometimes contradictory to environmental priorities. Local communities, especially in Kyrgyzstan, oppose mining developments in such cases where ecosystem or land damage caused by industrial operations could have negative implications for years. Residents fear their valleys will become polluted and people will stop buying their products (FE and KA 2017, Zoï 2012).

In view of growing energy demand, Kyrgyzstan, Tajikistan and Uzbekistan have chosen to increase their power generation capacities using both hydropower and non-renewable energy sources such as coal, deposits of which are accessible and affordable. Coal-fired plants would serve as a short-term solution to overcome energy deficits and increase energy security. The emerging trend towards the increasing use of coal for power generation and in cement production is a concern, however, since this use adds to the national carbon footprint and causes local air pollution.

FINANCING, TRADE RELATIONS AND IMPLICATIONS

China offers investments to low-income countries no one else can match. Rather than require conventional repayments on its investments, China accepts opportunities for long-term leases, mineral rights or infrastructure concessions. The low interest rates of 2.0–2.5 per cent and repayment over 20–30 years keep payment requirements low, and limit the need for ready cash, but in accepting the terms, the poorer countries increase their indebtedness and become even less attractive to other investors.

Prior to 1992 the newly independent Central Asian nations had no experience in a market economy. After independence, the energy-rich and industrialized countries – Kazakhstan, Uzbekistan and Turkmenistan – enjoyed capital inflows into energy, industrial projects and construction mainly from the West. The collapse of the Soviet economy and withdrawal of support and subsidies hit the mountain countries of Tajikistan and Kyrgyzstan particularly hard. After years of recovery and transition their economies approached the previous levels, but the countries' external debt increased as well.

Kyrgyzstan and Tajikistan are mostly importers from China, Turkmenistan is mostly an exporter, and Kazakhstan and Uzbekistan are more balanced. The proportion of each country's imports that are Chinese also varies, with Kyrgyzstan and Tajikistan having the greater Chinese shares of their total imports (with consideration that part of these imports may be designated to Russia). The presentation and analysis of general information on imports and exports is tricky. Where possible, this report uses United Nations trade statistics (UN Comtrade) visually synthesized by the Observatory of Economic Complexity (OEC MIT), and uses several years of data together with other global and national sources.

Azerbaijan



Azerbaijan is one of the oldest oil producing nations in the world and is a strategic partner of Central Asia and China as a connection to Europe. Launched in 2018 and projected to grow in the next decade, Aliyat port, south of Baku on the Caspian Sea, is the key transit point for containers and trains with goods on the way from China and Central Asia to Europe and vice versa (with projected transit of 500 000 containers per year). China and Azerbaijan are contemplating the development of joint ventures and industries. Recent examples of Chinese investments and technologies include construction of a large cement plant and growing collaboration in information and communication technologies and tourism. Azerbaijan's exports to China include energy and chemicals, and prospectively wine, agricultural products and plastics (UN Comtrade, Az Stat).



Infrastructure linked with BRI or financed by Chinese loans

General industrial production —— Railways ____ Ferries

Kazakhstan



Infrastructure linked with BRI or financed by Chinese loans

Uranium mining and processing
 General industrial production
 Rail industry
 Farming and food processing

Economic zones	<u> </u>	Railways
Refinery	_	Roads
Oil / gas production		Ferries
	••	Pipelines

In financial terms, Kazakhstan enjoys a reasonable trade balance with China. Its imports are growing, and its exports include metals, oil and gas. Uranium is also an important export as Kazakhstan is the world's top uranium producer and China is developing its nuclear power capacity. Wheat, vegetable oils and meat may join the list of Kazakh exports to China over time. As a large transit country, Kazakhstan offers three main corridors - to Western Europe through Russia, to the Middle East and Europe through the Caspian Sea and to the Indian Ocean and the Persian Gulf via Turkmenistan and Iran. Infrastructure developments, however, may endanger steppes wildlife and cause fragmentation of habitats, while increased shipping and energy exploration in the Caspian Sea may cause disturbance to its unique biodiversity.

Part of eastern Kazakhstan's water resources originate in China, and the countries' economic cooperation provides incentives to manage water resources collaboratively. Environmental cooperation could also extend to the protection of priority species in cross-border ecological systems of the Jungar and Tien Shan mountains. The potential for the smuggling of endangered and high-value species grows as trade grows, and customs controls are likely to be crucial in limiting the illegal trade in species.

China has expressed interest in greener energy, and Belt and Road projects may influence energy links and power generation based on coal. Chinese interest in the mining and processing industries of Kazakhstan is growing too. How Belt and Road projects in Kazakhstan will affect emissions is still to be determined.

Kyrgyzstan





Prior to the Belt and Road Initiative, China had developed some interests in Kyrgyz mining, and Kyrgyzstan served as a transit hub for Chinese goods on their way to the Dordoi and Kara-Suu markets and other destinations in Central Asia and Russia. More recently, Chinese economic activities in mining and domestic road and energy infrastructure have expanded. The border between the countries runs through rugged mountainous terrain where the construction of road and rail links is challenging at best. Nevertheless, Central Asian countries are discussing with China new infrastructure projects, including proposed railways from China through Kyrgyzstan to Uzbekistan and Tajikistan.

Chinese investments in the alternative main road (likely to be completed in 2021) that traverses the natural north-south divide in Kyrgyzstan will provide better access to Lake Issyk-Kul and will open mining prospects in central parts of the country in previously unviable areas. The reduced travel times mean reduced emissions, but better roads attract more traffic, and more traffic means more emissions. The newly created access to natural resources lies beyond the reach of typical impact assessments, and the additional exploitation of natural resources is a secondary effect that bears examining.

Another project – an oil refinery built in Karabalta in northern Kyrgyzstan with older technology to meet the lower fuel standard (Euro-3 / K-3) – is also being met with scepticism and dismay. When this grade of fuel is eventually banned, the refinery will become obsolete. The project's lack of transparency and complaints about poor local air quality leave officials vulnerable to criticism (Azattyk 2013 and 2016). Having to rebuild a facility that is obsolete before its time is a waste of both economic and environmental resources.

Infrastructure linked with BRI or financed by Chinese loans

production



Tajikistan



The negligible trade between China and Tajikistan increased dramatically when the first direct road linking the two countries via Kulma Pass opened about 15 years ago. The Chinese investments, which had been growing in Tajikistan before the completion of the road, have intensified, and with this booming trade, Tajikistan is becoming proportionally more dependent on China economically. China's economic interests in Tajikistan extend from power, cement and minerals to communications, textiles and agriculture.

Chinese investments in roads have cut travel times and distances by half in key areas of Tajikistan, and investments in mining have boosted production in what had been a lagging sector. These investments are structured so that Tajikistan grants China an interest in the mines, and China now dominates the Tajik mining sector. As in Kyrgyzstan, coal use in Tajikistan is a matter of energy security, and the development of natural gas infrastructure may enable the country to switch from coal to gas. Tajikistan also promotes the development of its vast hydropower potential, including at the Belt and Road forums (Rakhmon 2019).

A residential construction boom in response to the population growth in Tajikistan led to an excess capacity of cement production, and Tajikistan is now exporting cement. With its large carbon footprint, cement production is expected to change the country's modest GHG emissions profile (UNFCCC), and in combination with increased coal use may double overall GHG emissions. The countries are considering the establishment of "agricultural production parks" using Chinese technology and expertise. These developments may entail long-term land leases or the use of agricultural chemicals, and local officials may lack the expertise necessary to exercise control.



In contrast to the other Central Asia countries, Turkmenistan's exports to China are greater than its imports (UN Comtrade). Almost all of those exports are natural gas – trade that has developed over the past 10 years and that is expected to double in the next 10–15 years with the construction of new pipelines and development of new gas fields. In addition, railway transit links between China and Iran run through Turkmenistan.

As Turkmenistan attitudes shifted from the view that isolation is protective of independence to one of having nothing to lose in establishing better international links, the country restored and improved its domestic rail system and extended service to Iran, Afghanistan and China. Now, under the Belt and Road Initiative, rail connections remain an interest, but gas pipelines are a focus. The production of fertilizers and other chemicals for export to China may eventually receive more attention and investments.

Environmental concerns include the inevitable addition to methane emissions resulting from expansion of natural gas production and transfer. As the hottest and driest country in Central Asia, Turkmenistan faces additional challenges related to climate change and water resources, and, in both conception and design, economic developments need to account for extremely high temperatures, water scarcity and local floods, associated with intense precipitation in the mountains.



Coal

Chemical industry

In a fairly well balanced trade relationship, Uzbekistan exports mostly oil, gas, metals and cotton to China, and imports mostly electronics, machines and textiles. China views Uzbekistan's large and growing population as an attractive potential market, and with the most diversified economy in Central Asia, Uzbekistan is well positioned to increase its trade with China. Most Uzbek agricultural exports now go to Russia, but China represents another opportunity. With no common border between the countries, transit runs through Kyrgyzstan or Kazakhstan.

Within the past five years of the Belt and Road Initiative, as Uzbekistan and China strengthened trading relationships, numerous projects have been launched and some have been completed. The Qimchig rail tunnel project between Tashkent and the Ferghana Valley, for example, was finished guickly, and Uzbekistan is now interested in projects connecting it to China by way of Kyrgyzstan. China's Belt and Road investments in Uzbekistan include interests in oil prospecting and extraction, gas and coal power plants, information and communications technology - including 5G and smart cities - and the chemical industry.

As elsewhere in Central Asia, some Belt and Road projects will cut travel times, but will invite more traffic, will create more access to remote natural areas or may increase competition between transport corridors. As Uzbekistan makes plans for increasing agricultural production, the country's awareness of potential environmental consequences also extends to the use of water resources. To develop its food trade with China at large scale, Uzbekistan may either expand its agricultural area or convert some cotton fields to food production, or both. In the past, the overuse of water for cotton production using inefficient irrigation contributed to the fate of the Aral Sea. Food production is likely to require less water than cotton so a net environmental benefit may accrue from the transition. The introduction of water-saving technologies would increase that benefit. Any increase in food production would require the consideration of climate change and drought risks.



Mountains



Safeguards

Throughout Central Asia, national laws regulate water and land use, emissions and waste. The use of environmental impact statements is standard procedure, and bank safeguards, industry standards and voluntary compliance with good practices provide additional environmental protections. Regional, global and long-term instruments work to preserve access to the wilderness, to protect areas of global significance and to take measures in response to climate change. All the countries of Central Asia are signatories to the global environmental conventions – the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity and the United Nations Convention on Combating Desertification – and to numerous multilateral environmental agreements. China is also a member of many conventions and shares similar interests and commitments to address the global and regional concerns.

In 2020, China will host the Fifteenth Conference of the Parties to the Convention on Biological Diversity, which is expected to adopt a global framework for the 2050 Vision "Living in harmony with nature" and aims to galvanize the myriad initiatives and coalitions on biodiversity of all actors, including states, communities and companies. The year 2020 is also a milestone for progress on the Paris Climate Agreement and Sustainable Development Goals, where China's role, including the BRI outside its borders, is significant. In view of global importance of China's mining and industry enterprises in extractive and supply chains, Chinese Due Diligence Guidelines for responsible mineral supply chains were produced and released in 2015 with support of the Organisation for Economic Cooperation and Development (OECD).

Central Asia's environmental practices and traditions are different from China's, and for the most part, the Central Asia countries participate in Pan-European groups and the related multilateral agreements while China traditionally engages more with Asia-Pacific groups and South-South cooperation. Recently, however, China and Central Asia scientists participated in the joint mapping of key biodiversity areas, and in a step towards a common approach, followed the International Union for Conservation of Nature Global Standard on key biodiversity areas. The EU "Larger than Tigers" strategy for Asia, which covers Central Asia, China and other Asian countries, is now unfolding across the region aiming to save endangered, unique and valuable species and ecosystems, and potentially offers a vehicle for coordinated and cooperative approach on biodiversity conservation in Asia. The Critical Ecosystem Partnership Fund is planning a five-year investment, mainly in the form of small grants, with the focus on civil society engagement in conservation of the mountains of Central Asia. BRI actors may wish to engage with these and other regional initiatives for conservation expertise, information sharing and deciding on environmentally sound development options for economic projects and corridors.

The United Nations Economic Commission for Europe (UNECE) offers a range of instruments that could address some of the Belt and Road concerns or strengthen cooperation. The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus) promotes environmental information sharing and transparency and could provide BRI project managers with instruments and experience related to national information sharing and to specific projects. The network of Aarhus centres in Central Asia play an important role in raising environmental awareness and promoting information dissemination and public participation in decisions at national and local levels.

Three more technical instruments are the UNECE Convention on the Transboundary Effects of Industrial Accidents (TEIA), the UN-ECE Convention on environmental impact assessment (Espoo) and the UNECE Convention on Long-range Transboundary Air Pollution. TEIA promotes safety at an early stage of industrial project planning and helps prevention of and preparedness for industrial accidents that can have transboundary effects. Safety guidelines and good practices for tailings management facilities developed under the TEIA Convention supports authorities and mining operators in limiting risk of accidents at tailings and the severity of their consequences. Espoo promotes consultations in the planning stages for all major projects that are likely to have significant environmental impacts across borders. The Protocol on Strategic Environmental Assessment augments the Espoo Convention by ensuring that individual Parties integrate environmental assessment into their plans and programmes at the earliest stages. The Air Convention identifies specific measures to be taken to cut emissions and measure effects on health and ecosystems.

Finally, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) aims to ensure the sustainable use of transboundary water resources. Initially developed as a Pan-European instrument, it has been amended to become universally available. The Water Convention has been active in Central Asia for many years and has supported a number of national and regional water dialogues, consultations, hydrological and water quality monitoring improvements, basin commissions and adaptation measures to climate change. In addition to these conventions, UNECE conducts work on clean energy sources, transport connectivity and border crossing facilitation, forests, smart cities, land and statistics. The adherence of the Central Asian countries to the UNECE conventions and protocols is heterogenous (see the UN-ECE's website for the current status) but all the countries are participating in the organization's meetings on environmental policy.

In addition to the Pan-European instruments and practices, Central Asia has several regional instruments and cooperation agreements, including the Framework Convention for the Protection of the Marine Environment of the Caspian Sea. All the Caspian Sea states – which include Azerbaijan, Kazakhstan and Turkmenistan – are members. The region is discussing a Framework Convention on the Environment and Sustainable Development of Central Asia, along with the new Regional environmental action plan. Several bilateral cooperation agreements are also in place.

In most cases, the core national and local issues of interest – air quality; waste; protection of flora and fauna; water and land use; and public health – are well covered in environmental assessments and permits. Some countries' global commitments are not yet reflected in their national plans, and the Belt and Road Initiative may have tremendous influence on the disposition of these commitments – for better or worse – depending on the approach the countries take. The use of strategic environmental assessments or other techniques that capture regional, long-term and multi-sectoral effects of large projects is not yet common on the Belt and Road development agenda.

The highest level regional organization for cooperation on water and environmental issues in Central Asia is the International Fund for Saving the Aral Sea, directed by the heads of states, to deal with environmental and socioeconomic challenges of the Aral basin. The recently formed United Nations Human Security Trust Fund for the Aral Sea Region and the ongoing Central Asia Climate Mitigation and Adaptation Programme of the World Bank are other flagship initiatives. Funded by international donors and by the Central Asia states, these programmes are contributing to the reduction of environmental and climate risks.

Both China and Central Asia have established the regional environmental centers. The Regional Center for Ecology and Environment of Central Asia in Urumqi (under the Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences) deals with scientific studies, monitoring and education, and has partnership agreements with academic institutions across Central Asia. The Regional Environmental Center of Central Asia, with the head office in Almaty and country offices across the region, manages projects on water, energy and climate, and engages with a wide range of stakeholders - from students and NGOs to experts, decision-makers and parliamentarians. The Central Asian Institute for Applied Geosciences based in Bishkek is conducting regional research on glaciers, water resources and natural disaster risks. China Center for Environmental Cooperation under the Shanghai Cooperation Organization (an affiliate of the Ministry of Ecology and Environment of China) is a key partner for the International Coalition for Green Development of Belt and Road. A number of conservation and environmental NGOs both national and international are active in the region.

While regional and national environmental institutions are well established, expenditures on environmental controls, science and education in Central Asia are insufficient, especially in the countries with lower GDP. Environmental research and monitoring are suffering from the lack of skilled experts, limited training in modern methods, and limited information exchange. More could be done under BRI to bridge these gaps.

The Second Belt and Road Forum for International Cooperation has announced that China's Green Silk Road Envoys Program will train environmental officials from the BRI countries. Young researchers and scholars will also be supported, while big data platforms will contribute to improved decision-making.

Ramifications of Belt & Road projects on...

POLICY & SCIENCE



Follow good practices

- 1 Share science and monitoring data for improved decisions and awareness
- 2 Coordinate the use of common resources and conservation efforts
- 3 Promote cooperative cultural and educational opportunities
- Establish bilateral professional links on environmental assessments and norms at the institutional level

Exercise caution

- Pay attention to the concerns and voices of NGOs and local communities interested in BRI developments
- Recognize differences in approaches to environmental assessments and regulations, and honour common responsibilities and international commitments

Avoid the overuse of common resources and habitats fragmentation

In the broad context of policy and science, the Belt and Road Initiative should promote cooperative cultural and educational opportunities and encourage the coordination of the use of common resources. It should also seek opportunities to share recent scientific developments and findings relevant to the partners as an entry point for collaboration. Projects should work to avoid the overuse of common resources, and should recognize the differences in approaches to environmental assessments and regulations. China and BRI recipient countries in Central Asia can apply global, regional and sector-specific standards to protect the environment, health and well-being and to address local concerns.

Ramifications of Belt & Road projects on...

MINING & INDUSTRY



Follow good practices

- Support local roads, schools and hire a local labour force
- Promote waste minimization, recycling and sustainable consumption of water, soil and other natural resources
- Practice transparency, report on operations, income and environmental impacts
- 4 Conduct credible socio-environmental impact assessments

Exercise caution

- Avoid investments in mining of coal and primary mercury
- Avoid mining in ecologically sensitive areas
- Secure funding for proper restoration of mining sites after closure and ensure long-term safety and stability of industrial waste
- A Recognize and apply national legislative requirements and international environmental and safety standards

Extraction and processing of minerals are generating important export revenues, but unclear distribution of benefits, lack of transparency or poor environmental performance of some companies cause concerns and can trigger grievances among the local populations. Mining developments need to conduct credible socio-environmental impact assessments, practice and promote transparency, report on their operations and income, and provide briefings for local communities. Projects should also support local development needs such as roads, schools and water supply, and should train and hire a local labour force. Developments should avoid mining in ecologically sensitive areas, limit investments in the production of coal and primary mercury, eliminate the use of mercury in small-scale artisanal mining, and recognize and apply national legislative requirements and international environment, health and safety standards.

Ramifications of Belt & Road projects on... THE PRODUCTION, TRANSIT & USE OF ENERGY



Follow good practices

- Improve access to clean and affordable energy for local communities
- Promote energy efficiency in buildings and electric transport
- Favour the development of clean power sources such as wind and solar at both small and large scales, and promote technology transfer
- Follow best industrial safety practices in siting hazardous facilities such as oil refineries and pipelines

Exercise caution

- Limit the impacts of power infrastructure on migratory and endemic species, natural river flow and water ecosystems
- Minimize greenhouse gas emissions
- Avoid investments in coal power

Energy developments should favour clean power sources such as wind, hydro and solar at both small and large scales, and follow best industrial safety practices in siting hazardous facilities such as oil refineries and pipelines. Stationary and linear energy infrastructure projects should limit their impacts on migratory and endemic species, minimize their greenhouse gas emissions, and avoid investments in coal power except for explicit requests related to energy security from a national government in a country with vulnerable energy systems and abundant coal.

Ramifications of Belt & Road projects on... TRANSPORTATION & COMMUNICATIONS



Follow good practices

- Develop affordable telecommunications, especially in remote areas
- Develop tunnels to help year-round connectivity and to cut travel times and emissions
- Enhance communications that enable rapid responses to natural disasters, and invest in to hydrometeorological services and disaster risk reduction
- Prefer small electric or gas-powered cars and electrified railroads
- Plan logistic hubs that avoid congestions and promote new environmentally sound and attractive cities

Exercise caution

- Minimize the fragmentation of natural areas, nature reserves and migratory paths caused by road and rail development
 - Recognize that expanded infrastructure may bring additional environmental pressures
- Avoid excessive motorization
- Maintain reasonable, affordable tolls on tunnels and roads
- A Plan the major transportation and economic corridors carefully

Transportation projects should demonstrate a preference for electric or gas-powered individual cars, public transport and electrified railroads, and tunnel projects should help reduce the risk of avalanches and rock falls and cut travel times and emissions. Road and rail developments and communications projects should minimize the fragmentation of natural areas, nature reserves and migratory paths; tolls on tunnels and roads should be reasonable and affordable; and the development of ports and terminals should strive to avoid congestion.

Ramifications of Belt & Road projects on... THE PRODUCTION OF FOOD AND FIBRE



Follow good practices

- Respect local and customary land rights
- 2 Control soil erosion
- 3 Establish suitable grazing practices
- 4 Diversify crops
- 5 Promote fair trade and benefit-sharing

Exercise caution

- Avoid over-grazing
- Limit the use of pesticides

Consider the implications of climate change in long term land-use planning

Apply controls to genetically modified organisms and non-native crops and fruits (especially apples and pears)

Agricultural projects should respect local and customary land rights, promote fair trade and benefit sharing, support crop diversification, and establish suitable grazing practices. The production of food and fibre should control for soil erosion, limit the use of pesticides, and regulate genetically modified organisms and non-native crops and fruits, especially apples and pears.

Ramifications of Belt & Road projects on...

TRADE & URBANIZATION



Follow good practices

- Encourage replication of Chinese successes in improving urban air quality, public transport and smart city planning
- 2 Encourage green procurement, eco-friendly goods and products
- 3 Control illegal trade in endangered species and easily depleted resources such as medicinal plants

Exercise caution

Recognize that increased cement production leads to higher greenhouse gas emissions and potential over-capacity

Limit imports and trade in household products and toys that may be contaminated by chemicals

Minimize pollution from the joint projects

As trading partnerships develop and grow, the parties should work to control illegal trade in endangered species and easily depleted resources such as medicinal plants; should encourage eco-friendly goods and safe toys; and should practice green procurement. Countries should avoid excessive imports and trade in plastic products and waste, and urban planning and development should recognize that increased cement production leads to higher greenhouse gas emissions.

The speed with which Belt and Road developments are proceeding is limiting the opportunities for outside interests to raise issues of concern in a timely manner. Remote and on-site monitoring of projects is possible, but high-level pressure for project results keeps the pace of development rapid enough to render some concerns moot before they are expressed. This situation raises questions about how interested parties can respond effectively.

In some Belt and Road developments, good intentions are bumping up against hard realities. In the case of coal power, for example, Central Asia may opt for energy security despite the knowledge of coal's environmental costs in terms of waste, air pollution and carbon emissions. The regional history of interruptions in gas availability makes for wariness about the security of the source, as do uncertainties about when gas pipelines might bring new supplies. For some, energy security means investments in locally available coal. China has opportunities here to help negotiate the availability of gas or to assist Central Asia in the conversion to renewable resources – an option that is consistent with China's domestic policy.

Renewable resources and technologies are already competitive and are likely to become cheaper than fossil fuel technology. In addition, in the modern world, big projects such as the Belt and Road initiatives need to be screened for climate change implications and to build in climate resilience. Central Asia is already experiencing sea level fluctuations on the Caspian Sea, its glaciers are melting and floods are affecting densely populated areas. Project site selection and economic corridor planning is crucial, and environmental assessments need to go beyond the standard concerns to consider the longer-term effects of climate change and species and ecosystems survival.



Looking Ahead

The Belt and Road projects in Central Asia can benefit from China's commitments to global environmental concerns on climate change and biodiversity, and from its domestic experience in cleaning up pollution, improving urban air quality, and developing renewable energies and electric cars. China's long reach and powerful influence can transform socioeconomic patterns and environmental conditions, and its actions regarding Belt and Road projects affect such high-stakes outcomes as the futures of species and wilderness areas and the maintenance of traditional lifestyles. Tangible improvements in the quality of life need not come at the expense of the environment and culture of Central Asia, and progress towards the Sustainable Development Goals is incompatible with environmental or cultural losses.

China's Green Credit Guidelines obligate Chinese banks to comply with host country laws and international norms in their overseas lending. These guidelines are among the most progressive sustainable finance policies in the world, but effective implementation remains a challenge. Of particular concern are international norms requiring high-quality socio-environmental assessments and public consultations.

As Belt and Road projects in Central Asia grow in diversity, geography and number, environmental and social monitoring and safeguards need to keep pace. The financing of Belt and Road projects varies from investments through large banks and stateowned enterprises to private investments in mining, trade and other business. Most contracts, project plans and agreements are bilateral negotiations that often do not allow for public consultation or the disclosure of information.

China and its partners have established international groups of stakeholders committed to promoting green and sustainable investments as part of the Belt and Road. The International Coalition for Green Development on the Belt and Road is helping countries achieve their aspirations associated with the Sustainable Development Goals and is acting as a platform for policymakers, businesses, investors and other stakeholders to engage in a dialogue on sustainable development and social and environmental safeguards. The Coalition activities include policy dialogue and communication, sharing knowledge and data in a number of thematic areas, such as biodiversity, green energy and finance, sustainable transport and infrastructure and others. As of February 2019, 20 countries, 20 international organizations and NGOs, and over 50 research and business organizations joined the Coalition (ICGDBR).

The BRI also includes the Green Lighting and the Green Cooling initiatives, the Belt and Road Green Finance Index and green bonds, the Silk Road Environment Programme and earthquake risk reduction cooperation (SBRF 2019). From the perspective of the countries and people of Central Asia, the success of the Belt and Road Initiative may depend on how well the specific projects meet the tests of ensuring safeguards, maintaining transparency and engaging the communities of interest. Rising to these challenges is the surest way for China and its partners to provide for the protection of the precious environmental and cultural heritage of the region. The Coalition has many opportunities to assist in these efforts.

All the Central Asia countries have provisions for environmental impact assessments, permits and pollution controls. Strengthening how these existing tools are used in large and fast-moving BRI projects will help the countries avoid getting locked in to obsolete and polluting technologies and will minimize environmental damage. By improving arrangements for information and experience exchanges at the institutional level with their Chinese counterparts, environmental authorities in Central Asia can improve compliance with national regulations and the Chinese Green Credit Guidelines.

GENERAL CONSIDERATIONS

Belt and Road partners can secure local support and improve the prospects for the long-term success of projects in Central Asia by practicing transparency, applying relevant safeguards, and engaging all stakeholders with respect. Advanced notice and information about prospective projects can go a long way toward maintaining the goodwill of interested parties and the general public, and the greening of Belt and Road projects may depend on the support and engagement of a range of public and private organizations. Project planners and managers need to provide civil society watch-dogs with appropriate channels for communicating their concerns and ideas. For some people in the region, bribery and corruption remain major concerns, and transparency in procurement and respectful exchanges of views with affected parties can reduce tensions and allay fears.

The environmental safeguards already in place include national legislation, regulations and permits, legally binding instruments such as international conventions, and private sector provisions such as the requirements of lending agencies and banks. Three groups who need to be aware of the existence, importance and relevance of these safeguards – stakeholders in the countries, Chinese stateowned enterprises and private sector partners – may need training in the applications and implications of these various instruments. The International Coalition for Green Development may be able to facilitate these efforts. In addition, environmental impact assessments, strategic impact assessments, the identification of key biodiversity areas and the analysis of social and environmental costs can all contribute to a common understanding of the potential costs and benefits of a project. These considerations play out across the range of projects.

SPECIFIC CONCERNS

The continuing lack of transparency in the mining and others sectors requires the perseverance of Belt and Road partners. Governments need to ensure that the local concerns are aired and respected in order to reduce the socio-environmental risks and tensions. Belt and Road projects need to bring mining practices into compliance with modern standards by ensuring that competent authorities provide the necessary monitoring and oversight, and need to establish the fair distribution of benefits.

The Belt and Road Initiative has an opportunity to promote renewable energy sources and to encourage the reduction and eventual elimination of the use of coal. The substitution of renewable sources for coal would lower emissions and provide significant public health benefits.

Infrastructure investments need to consider possible long-term impacts of climate change, especially in climate-sensitive environments such as high mountains and glacier zones, coastal areas, and areas subject to natural disasters. The Belt and Road Initiative should encourage collaboration on incorporating climate considerations into environmental assessments. The exchange of knowledge resulting from such collaboration could lead to more effective responses and greater resilience to climate change and disasters. Infrastructure projects should not contribute significantly to greenhouse gas emissions, and should seek to mitigate impacts of climate change by promoting greater fuel efficiency, shortening travel times and distances, developing ecosystem-based solutions through afforestation along roads and providing for sustainable land use.

Identifying and managing key biodiversity areas and improving the efficiency and connectivity of existing protected areas and habitats are basic elements in the ongoing protection of the region's biodiversity. The genetic resources of the mountains of Central Asia need governments and project planners and operators to maintain invasive species and phyto-sanitary controls at borders and transit points, and to promote bio-friendly methods of crop production and land use.

The planning of infrastructure projects needs to contemplate the implications for biodiversity. Excessive and outdated infrastructure leads to land degradation and natural habitat fragmentation, and many irrigation systems in Central Asia fail to meet modern standards. Governments and project operators can work together with affected communities and nature enthusiasts to create suitable conditions for the persistence of species and ecosystems, and can ensure that the expansion of road networks in Central Asia receives proper planning, design and monitoring.

Last but not least, the Belt and Road Initiative should not disrupt traditional lifestyles essential to the preservation of the identities of local ethnic and indigenous groups. Their traditional uses of natural resources and habitats are part of the ancient Silk Road history, and need to be treasured in times of globalization and modernization.



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ACRONYMS AND ABBREVIATIONS

BRIBelt and Road InitiativeGDPGross Domestic ProductNGONon-Governmental OrganizationTEIAUNECE Convention on the Transboundary Effects of

- Industrial Accidents
- UNECE United Nations Economic Commission for Europe

VARIATIONS IN SELECTED NAMES

Name used in the report	Variations, alternatives
Belt and Road	— One Belt, One Road (OBOR)
Bokhtar	— Kurgat-Tube, Kurhon-Teppa
Gissar (city, mountains and valley in TJK) —	— Hissar, Hissor
Istiklol —	— Taboshar
Khorgos ———	— Horgos
Murghab ————	— Murghob, Murgap, Margiana
Nur-Sultan ————	— Astana
UN Environment	 United Nations Environment Programme (UNEP)
Zeravshan	— Zarafshan, Zerafshan

Many geographic and local names are pronounced and spelled differently depending on the international or local usage, historical and modern style and other peculiarities. Some cities have been renamed recently, but the older versions are often still used. This report maintains a consistent spelling of names, and the table offers some variations or alternatives of selected names used in the report.



Greening the Belt and Road Projects in Central Asia

A Visual Synthesis

The official launch of the Belt and Road Initiative in 2013 ushered in a period of remarkable transformations in Central Asia. The development of new regional transit corridors linking north to south and east to west and the modernization of telecommunications networks are connecting the people in the region to each other and to the rest of the world. Chinese investments and technologies provide Central Asia countries with the opportunity to leapfrog some intermediate steps in the development of their infrastructure and economy, and to expand their global and regional trade and transportation networks.

For the five countries of Central Asia – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – the Belt and Road Initiative and the associated Chinese investments are synonymous with a new era of political and economic relations. This report considers the interests of the Belt and Road participants, and examines the implications of Belt and Road projects for the environment and for the prospects for sustainable development in the region. The rise of a green economy and the further pursuit of good governance are necessary steps for successful long-term sustainable development in Central Asia. The greening of the energy, transportation and agriculture sectors confers environmental benefits, and may give the countries a competitive advantage. China and its partners express their willingness to make Belt and Road developments mutually beneficial and greener. But how canthese promises be fulfilled in Central Asia? Are the economic and political interests and the speed of the development under the Belt and Road initiative conducive to greening the investments?

This visual synthesis for the first time analyzes the developments, risks and opportunities of the Belt and Road in Central Asia in a concise format and richly illustrated by more than 30 maps, cartograms and infographics. The report was developed by Zoï Environment Network in cooperation with UNEP, Switzerland and partners in Central Asia and China.

