STOCKTAKING ON INCLUSIVE GREEN ECONOMY IN CENTRAL ASIA AND MONGOLIA:

A SUB-REGIONAL PERSPECTIVE

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ABBREVIATIONS AND ACRONYMS

2030 Agenda	2030 Agenda for Sustainable Development
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
B&R initiative	Silk Road Economic Belt and the 21st Century Maritime Silk Road initiative
CA	Central Asian countries
CAEWDP	Central Asia Energy-Water Development Program
CAHMP	Hydrometeorology Modernization Project
CAM	Central Asian countries and Mongolia
CAREC	Central Asia Regional Economic Cooperation Organization
CSEC	China Center for SCO Environmental Cooperation
EBRD	European Bank for Reconstruction and Development
EC-IFAS	Executive Committee of the IFAS
EDB	Eurasian Development Bank
EECCA	European Caucasus and Central Asia
EGS	Environmental Goods and Services
ENVSEC	Environment and Security initiative
ESIAs	Environment Social Impact Assessments
ETB	United Nations Environment Programme Economics and Trade Branch
EU	European Union
FAO	Food and Agriculture Organisation
FDI	Foreign direct investment
FPIC	free prior informed consent
GBPP	Green Bridge Partnership Programme
GDP	Gross domestic product
GEPA	Green Economy Policy Assessment

GHG	Greenhouse gas
GIZ	German Development Cooperation
GNI	Gross national income
HDI	Human Development Index
ICSD	Interstate Commission on Sustainable Development
ICWC	Interstate Commission for Water Coordination of Central Asia
IFI	International Financial Institution
IFAS	The International Fund for the Aral Sea
IFI	International Financial Institution
IGE	Inclusive green economy
IMF	International Monetary Fund
INDC	Submitted Intended Nationally Determined Contribution
IWRM	Integrated water resource management
JICA	Japan International Cooperation Agency
NPSD	National Program of Socio-Economic Development, Turkmenistan
NSDS	National Sustainable Development Strategy, Kyrgyz Republic
PAGE	Partnership for Action on Green Economy
PEI	Poverty Environment Initiative
PPCR	Pilot Program for Climate Resilience, Tajikistan
RES	Renewable Energy Sources
Rio+20	United Nations Conference on Sustainable Development in 2012
SCO	Shanghai Cooperation Organization
SDGs	Sustainable Development Goals
SFA	State Forest Administration, China
SWF	Sovereign wealth fund
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCC	United Nations Framework Convention on climate Change
USSR	Union of Soviet Socialist Republics

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FOREWORD

The countries of the Central Asia region and Mongolia have a long history of social and economic ties, and this trend continues today. While they face a number of common challenges in their efforts to build sustainable economies and societies, they also share opportunities. This report serves as a strong starting point with which policymakers and stakeholders in Central Asia and Mongolia can begin to address social and environmental challenges for their region.

International investments in Central Asia and Mongolia have increased in recent years and we have good reason to think that this trend is expected to continue. China - but also international and multilateral donors and development financing institutions like the Silk Road Infrastructure Fund, the New Development Bank, and the Asian Infrastructure Investment Bank - will invest heavily in the region. This trend is a unique opportunity for Mongolia and Central Asian countries to use incoming funds to transition towards inclusive and green economies.

While countries and organizations have begun to work on greener economic models at the national level, this report breaks new ground in taking a regional approach to help build an inclusive green economy for the whole of Central Asia and Mongolia.

If Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan and Uzbekistan are willing to use foreign investments to start the shift towards inclusive green economies, their governments will need to design and execute policy frameworks that will ensure that the money is used to work towards resource-efficient, low-carbon and socially inclusive goals.With those countries sharing many socio-economic challenges, and taking into account the transboundary nature of many of them, regional cooperation and coordination on an inclusive green economy will help to make the transition easier and have more impact.

It is my hope that recommendations generated by this report will catalyze regional dialogue and cooperation on sustainable development in Central Asia and Mongolia, and help countries transition to inclusive green economies. After all, it is only fitting that, with human well-being at the centre of the 2030 Agenda for Sustainable Development, national leaders work together on cooperative solutions for a better future.

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INTRODUCTION

SCOPE AND PURPOSE

This report was produced as part of the United Nations Environment Programme (UNEP) project "South-South Cooperation in Mongolia and Central Asian Countries: Sharing Knowledge on Inclusive Green Economies". The project aimed to support Mongolia and Central Asian countries in developing their research capacity in the area of Green Economy and Ecological Civilization and to share this knowledge with decision makers and technical experts through knowledge exchange between China, Central Asian countries, and Mongolia.

One of the key components of the project was a six-week research fellowship programme that gathered green economy researchers from China, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan at Beijing Normal University. Over the course of the programme, research fellows participated in a number of lectures, seminars, workshops, field visits, knowledge exchange, training events, and conducted original research on inclusive green economy priority areas in their home countries. Their research outputs contributed to the country-specific sections of this report. The sub-regional issues were also drawn from key issue areas identified by the research fellows.

An underlying area of focus for this project has been how sub-regional development plans, including China's Silk Road Economic Belt and the 21st Centry Maritime Silk Road initiative (B&R initiative), can serve as opportunities for the countries of Central Asia to transition towards inclusive green economies (IGEs) and achieve the Sustainable Development Goals (SDGs). The information and analysis presented in this report therefore emphasize this aspect of regional development. Within that context, the goals of this report are to identify key sub-regional economic, social, and environmental challenges in Central Asia and to propose measures that can foster sub-regional cooperation as a means to address those challenges and take advantage of opportunities for a shift to IGE.

AN EMERGING NEED FOR AN INCLUSIVE GREEN ECONOMY

Beginning in 2008, green economy[1] and related concepts have received increasing attention at both the international and national levels. Green economy was recognized as an important tool for achieving sustainable development in the outcome document of the United Nations Conference on Sustainable Development in 2012 (Rio+20), and since that time a number of countries around the world have adopted green economy strategies and policies.

As countries began to develop national green economy strategies, UNEP revisited the original green economy concept to identify how it could better meet countries' requests for support that reflected a diverse range of national contexts. Through this process, green economy evolved into IGE, which places increased emphasis on the connection between planetary boundaries and economic growth, on governance and institutional drivers of sustainability, and on the means by which the green economy can mitigate growing inequality. Inclusive green economy significantly expands the scope of the original green economy concept to describe how green economy can help address cross-cutting issues such as human health and well-being, growing inequality, and humankind's relationship with nature. By focusing on the institutions, regulatory frameworks, and the policies and incentives that are the shapers and drivers of market behaviour and societal decisions, IGE can help countries achieve the SDGs by refocusing political attention and financial resources on better managing our common wealth and natural resources.

Practically speaking, an IGE is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance resource efficiency, prevent the loss of biodiversity and ecosystem services, build green job skills, and promote equitable distribution systems. These investments need to be catalysed

and supported by targeted public expenditure, policy reforms, regulatory changes, and equitable distribution systems. This development path should maintain, enhance, and, where necessary, restore natural capital as a critical economic asset and source of public benefits, especially for poor people whose livelihoods and security depend strongly on their local ecosystems.

With human well-being at the centre of the SDGs, the 2030 Agenda for Sustainable Development (2030 Agenda) presents an excellent opportunity to reframe economic policy around sustainability. IGE is an excellent tool with which countries can work towards such a shift. While the transition to IGE is directly relevant to certain SDGs, the positive impacts of IGE policies are cross-cutting and often contribute to many of the SDGs at the same time. For example, through its focus on conserving and creating natural capital and public wealth, technological innovation, and job creation, IGE can contribute to inclusive and sustainable economic growth, full and productive employment, and decent work for all (SDG 8). At the same time, achieving progress on SDG 8 can have benefits associated with additional SDGs, such as poverty reduction (SDG 1), gender equality (SDG 5), and health (SDG 3).[2]

Countries that wish to adopt IGE strategies of their own need to identify the critical sustainable development issues that they face and establish and implement their own sets of policies to achieve the transition to IGE based on their current environmental base, human capital, economic structure, and governance practices. This will involve shifting investment to greener sectors of the economy; changing policies and fiscal incentives to encourage greener programmes while discouraging traditional "brown" ones; providing education and training to help workers make this shift while improving living standards; building public support for the transition; and tracking progress to make sure that green goals will be met. It is also important to use a broader range of indicators than conventional ones like gross domestic product (GDP) to track progress towards IGE.

Implementation of IGE (i.e. the IGE approach) typically involves an initial stocktaking or scoping study of existing national sustainable development challenges

IGE policies can help ensure that economic growth is shared equitably and increases overall well-being.

and the policies and priorities needed to address them, which is then complemented by an in-depth Green Economy Policy Assessment (GEPA).[3] Because national IGE strategies are built around countries' self-identified sustainable development priorities, they respond directly to specific national social, cultural, economic, and environmental contexts and can drive positive and sustainable change in the countries that adopt them.

INCLUSIVE GREEN ECONOMY IN CENTRAL ASIA AND MONGOLIA

The countries of Central Asia and Mongolia (CAM) have a long history of trade relations, forming the heart of the historical Silk Road that linked the Asian and European markets. Today, their position at the center of the Asian continent and at the crossroads of East and West still offers the potential for the sub-region to play an important role in the international economy.

Amongst the CAM countries, while many differences exist (see table 1), there are a number of similarities that are relevant to sustainable development in the sub-region. All have relatively small populations, low population density, high literacy rates and relatively low levels of diversity in their economies, with mineral extraction, agriculture and fossil fuels playing important roles (CIA, 2016). This dependence on natural resources is accompanied by relatively high rates of poverty and unemployment, as well as low standards of living, which are exacerbated by increasingly large urban-rural gaps in income and lack of access to many basic services. In addition, the Central Asian countries were all part of the former Union of Soviet Socialist Republics (USSR), which has had lasting economic, social and environmental effects. Prior to independence, their economies were structured to support the goals of the larger USSR, and social and environmental protection were low priorities. The CAM countries are also all landlocked and depend on China and the Russian Federation for significant portions of their trade and investment (UNCTAD, 2015), as well as for access to global markets. These countries, therefore, share a variety of socio-economic challenges, and a holistic - and ideally sub-regional - development approach would help them to best tackle these interconnected issues and more sustainably manage their resources.

One Belt, One Road: A Silk Road for the 21st Century

Stretching from Europe through the Middle East and across the steppes of Central Asia to China, the Silk Road once served as a crucial trade route that united West and East through commerce. Named after the textile that drove China's trade with the rest of the world around 100 BCE, the Silk Road's transcontinental route spurred important cultural and commercial exchanges between Asia, Europe and Africa until the 1500s. In 2013, Chinese President Xi Jinping announced China's intention to revive the ancient trade route as The Silk Road Economic Belt and the 21st Century Maritime Silk Road. Also known as the Belt and Road Initiative and One Belt, One Road, China's efforts are expected to enhance regional connectivity by focusing on five areas of cooperation, including infrastructure, trade, policy, finance and people. The initiative will build six transnational China-centric economic corridors: a new Eurasian land bridge of freight trains, a Mongolia-Russia corridor, a Central Asia-West Asia strip, an Indochina peninsula passage, as well as a Pakistan and Bangladesh-China-India-Myanmar passageway (Lee, 2016). In addition to large infrastructure, the Belt and Road Initiative is expected to lower tariffs, promote investment and increase cooperation on shared natural resources in Western China and Central Asia (China, 2015). The project – which is expected to cost up to US$ 1.4 trillion – will be partly financed by the Asian Infrastructure Bank and China's Silk Road infrastructure fund (Bloomberg, 2016).

CAMC Country Data	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan	Mongolia
Population (mil)	17.0	5.7	8.2	5.2	30.2	2.8
GDP ($bil)	232.0	7.2	8.5	41.9	56.8	11.5
GNI ($/capita)	11550	1210	990	6880	1880	3770
HDI	0.788	0.655	0.624	0.688	0.675	0.727
CO2 emissions (metric tons)/pc	15.8	1.2	0.4	12.2	3.9	6.9
Energy power consumption per capita (kWh)	4,892	1,887	1.682	2,602	1,637	1,909
Energy depletion % of GNI	11.8	0.4	0.1	15.5	5.3	4.3
Total freshwater withdrawal % of internal resources	32.9	16.4	18.1	1,989,3	342.7	1.6
Agriculture % of total freshwater withdrawal	66	93	91	94	90	44
Investment % of GDP	24.0	34.0	19.0	47.0	23.0	61.0
Agriculture % of GDP	5.0	18.0	27.0	15.0	19.0	16.0
Industry % of GDP	37.0	27.0	22.0	48.0	26.0	33.0
Services % of GDP	58.0	56.0	51.0	37.0	55.0	50.0
Exports % of GDP	38.0	47.0	19.0	73.0	28.0	45.0
Imports % of GDP	27.0	96.0	68.0	44.0	32.0	67.0
Trade % of GDP	57.0	109.0	62.0	67.0	45.0	92.0
Land area Msq km	2,725.0	200.0	143	488.0	447.0	1,564
GNI B	196.8	6.9	8.1	36.1	56.9	10.7
GNI, PPP B	352.3	17.6	20.5	67.7	159.9	25.0

Source: World Bank (2015a), The Little Data Book and UNDP (2015), 2015 Human Development Index, World Bank (2016s)

Since the dissolution of the USSR in the early 1990s, the CAM countries have been working to restructure their economies to help achieve national development goals, but are still limited by several factors. One of the most important of these is the lack of infrastructure, much of which has not been significantly updated since the Soviet era. In this regard, the CAM countries have, to varying degrees, recognized the importance of improving the diversity and self-sufficiency of their economies and shifting towards greener development, although significant work still remains to be done. This will require new investment, policy and regulatory changes, and the strenghthening of social and environmental protection measures.

Implementation of the IGE approach at both the national and sub-regional levels could help CAM countries to address socio-economic issues and work towards sustainable development by diversifying their economic structures, increasing income and equal employment opportunities, and reducing environmental impact and natural resource depletion. Unlike traditional models of economic development, the IGE approach focuses on the accumulation of renewable natural capital (e.g. freshwater and forests), clean physical capital (e.g. solar panels, wind

turbines, and green public transport systems), human capital with green job skills (e.g. workers trained in the installation, operation and maintenance of energy efficient equipment), and social capital (e.g. equitable access to opportunities and social services). It also involves the introduction of policies aimed at moving consumption, investments, public spending, and trade towards the goods and services produced with this new generation of assets, which will help countries to shift towards more sustainable production patterns.

While the shift to IGE will require significant investment, there has been increasing international interest in investing in CAM development projects in recent years, and this trend is expected to continue in the medium term. For example, China's B&R initiative, a recently established Silk Road Infrastructure Fund, the Green Silk Road Fund, the New Development Bank, and the Asian Infrastructure Investment Bank (AIIB) are all committed to investing in sub-regional development. In addition to investments from multilateral development financing institutions, Central Asia also attracts foreign direct investment (FDI). The current situation therefore presents an opportunity for the countries of the region to use incoming investment to transition towards IGE. Notably, the Green Silk Road Fund has an explicit focus on investing in green sectors of the economy - such as renewable energy – and therefore has clear potential to be an important driver of the transition (Xinhua Finance, 2015).

The natural environment, societies, and economic activities of the CAM countries are highly interconnected, which increases both the risks and benefits that may result from the continuing pursuit of economic growth and improvements in living standards and overall well-being. Recognizing this, the countries of the region are engaged in a number of programmes and partnerships that support the shift to IGE, and are seeking ways to further accelerate the transition. Through their participation in this scoping exercise, the CAM governments hope to identify and better understand the critical issues that need to be addressed and to promote further cooperation. Green economy related issues and activities of each CAM country are summarized below. These summaries are followed by a discussion of cross-sector issues and impacts, the sub-regional aspects of these issues, and the benefits of further sub-regional cooperation.

CAM countries have started to adopt sustainable development strategies, some of which contain, to varying degrees, IGE elements. Mongolia, for example, has been working under the Partnership for Action on Green Economy (PAGE) to implement its National Green Development Strategy and has engaged in partnerships to promote green finance, while Kazakhstan has been promoting international cooperation for sustainable development under the Green Bridge Partnership Programme (GBPP). The Kyrgyz Republic has also identified low carbon green growth as a priority. In 2012, it established a National Council for Sustainable Development to oversee the mainstreaming of environment into its overall development plans, and in 2016 it became a PAGE partner country. Tajikistan also has a long-term strategy for transitioning to sustainable development (UNECE, 2012). At the sub-regional level, the Interstate Commission on Sustainable Development (ICSD) has recognized the value of ongoing IGE work for its member states (Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan), and the five Central Asian countries have endorsed the voluntary pan-European Strategic Framework for Greening the Economy in 2016, a tool that supports countries' transition to a green economy and at the same time directly contributes to the implementation of SDGs.

The diverse geography of the CAM sub-region presents a wide array of IGE opportunities.

CURRENT GREEN ECONOMY DEVELOPMENT STATUS AND CHALLENGES IN CAM COUNTRIES

This section gives a brief overview of the sustainable development priority areas and existing green economy policies of each of the CAM countries.

KAZAKHSTAN

Kazakhstan is the most economically developed of the CAM countries; its per capita gross national income (GNI) of US$11,670 (2014) is the highest among CAM countries (World Bank, 2016a). However, with an economy strongly based on fossil fuel production and export, the fall in oil prices between 2014-2016 has slowed GDP growth from 6 percent in 2013 to 4 percent in 2014 and below 2 percent in 2015 (ADB, 2015a). In addition to oil, gas and coal, other major exports include wheat, textiles, and minerals. Agriculture accounts for only 4.5 percent of GDP, the smallest share in CAM, but continues to employ almost 25 percent of the working population (World Bank, 2016b). 9.1 percent of electricity is generated by hydropower, and the remaining 90.9 percent from fossil fuels (World Bank, 2015a).

Strong economic growth and a relatively low unemployment rate during the last 15 years have helped to achieve a poverty rate of less than 3 percent of the population living below the national poverty line (World Bank, 2016c; 2016d). Kazakhstan's HDI of 0.788 (2014) is the highest in CAM (UNDP, 2015c). However, life expectancy at birth, which was 70 years as of 2013, is low for Kazakhstan's level of economic development due to challenges in restructuring the healthcare system (World Bank, 2016b).

Kazakhstan is the largest of the CAM countries, covering a sparsely populated area of 2.7 million km^2 with relatively little precipitation (Kazakhstan, 2014). Grassland plains occupy the biggest part of the country, but are mostly used as pasture, so that only 8.9 percent of the land remains as arable land and 1.2 percent as forest area (World Bank, 2015a). The country's highest profile environmental disaster concerns the Aral Sea, which is drying up and leaving behind polluted and salinized soil as a result of its two main tributary rivers being diverted for irrigation (Harriman, 2014). At the same time, development of the oil and gas sector has had major adverse impacts on the environment and radioactive contamination, left over from the Soviet era, remains one of the most severe environmental threats in the country (UNECE, 2008).

CURRENT NATIONAL IGE PROGRESS

Kazakhstan has taken a leading role in the transition to IGE in Central Asia. In 2013, following the 2012 Rio+20 conference, it adopted a concept for the transition to a green economy, whose first stage (2013-2020) focuses on the optimization of resource use, improvement of environmental performance and creation of new "green" infrastructure (Ospanova, 2014; Kazakhstan, 2015a).

Green transportation infrastructure in Kazakhstan.

The government has set concrete targets for 2020, 2030, and 2050 for greening key economic sectors. In the energy sector, these include a 3 percent renewable energy target for 2020, a 15 percent reduction of CO_2 emissions from energy production by 2030 and a 25 percent energy efficiency improvement by 2020 compared with 2010 (energy consumption per unit of GDP). Other objectives include eliminating water shortages for the population and agriculture by 2020, a "European level" of local air pollution by 2030 (SOx and NOx emissions), and the development of a comprehensive national waste management programme (Sospanova, 2013). To achieve these goals, the government has started to integrate them into sectoral programmes like "Energy Efficiency 2020" and "Agribusiness 2020", and has adopted supportive legislation like feed-in tariffs for renewable energy in 2013 (Prime Minister, 2013; RMW, 2013).

Central to Kazakhstan's IGE development is its Green Bridge Partnership Programme (GBPP). The GBPP was initiated in 2010 as a regional collaborative mechanism to achieve "green economic growth in Central Asia through international cooperation and the facilitation of technology transfer, knowledge exchange and financial support" (MEP RK, 2013).[4] Initially, the GBPP received a lot of attention from European partners; however, as of 2016 momentum has slowed. While the charter in support of the GBPP has been signed by 14 countries,[5] only one other CAM country is among the signatories.

Kazakhstan's IGE development is supported by international projects like the joint European Union (EU), United Nations Development Programme (UNDP) and United Nations Economic Commission for Europe (UNECE) project "Supporting Kazakhstan's transition to a green economy model" that targets the water sector and a joint programme between the Kazakh Ministry of Energy and UNDP to tackle electronic waste (UNDP, 2015a; 2015b). Domestically, the "Coalition for the "green" economy, the G-Global network",[6] the Green Academy, the Institute of Ecology and Sustainable Development, and the Institute of Human Health are all important proponents of the green agenda. The upcoming Astana EXPO 2017, with the theme "Energy of the Future", is an opportunity for Kazakhstan to generate further support for the IGE transition.

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN KAZAKHSTAN

A shift to renewable energy represents both an IGE opportunity and an IGE challenge for Kazakhstan. The country's geography offers high potential for renewable energy production. Vast open areas with abundant sunlight during summer months and considerable wind enable solar and wind energy production (RMW, 2013). Additionally, Kazakhstan is endowed with some of the minerals used to construct solar panels. With proper investment in technology and production, it could develop manufacturing capacity to reduce the costs of installing its own solar power capacity, create jobs, and develop more green exports (Safirova, 2014). In the southern part of the country there is already some hydropower generation, with the potential for expansion (Kazakhstan, 2015b).

However, despite these natural advantages, capitalizing on them will be a challenge. Significant investment will be needed to develop renewable energy capacity, and government funding is heavily dependent on revenues from fossil fuels. Sovereign wealth funds (SWFs) can serve as potential solutions to such dilemmas by diversifying revenue streams to protect against fluctuation in the price of oil and generate additional returns that can be spent on economic and social development projects (such as investing in renewable energy). However, while Kazakhstan does have an SWF, it, like the country's economy as a whole, has been negatively impacted by the fall in the price of oil from mid-2014 to present. Foreign direct investment and multilateral development loans may provide the necessary financial resources for developing the clean energy sector, but such investment would need to be accompanied by policies that help to shift demand towards renewables (e.g. taxes that increase the cost of coal-based electricity or subsidies for clean energy) and promote increased energy efficiency. In addition, in order for the renewable energy sector to be sustainable and produce benefits for Kazakhstan in the long-term, national private sector involvement is critical.

And while hydroelectric generation offers a promising source of clean energy, the construction of large and medium dams remains controversial given the increasingly scarce water supply in the country and the considerable environmental and social impacts of such projects, which impact wildlife habitat, downstream water supplies, and can potentially displace populations living in flooded areas.

Kazakhstan also faces a challenge to ensure that economic benefits are shared equitably amongst different sectors of its population. For example, while the country's oil and gas industry generates the majority of its income, it is the largely poor rural populations that live in areas of fossil fuel extraction who are most vulnerable to the negative health and environmental impacts associated with that industry (Ospanova, 2014).

KYRGYZ REPUBLIC

The Kyrgyz Republic is a low-income country whose economy depends heavily on remittances from migrant workers abroad (equal to 30.3 percent of GDP), agriculture (17.3 percent of GDP), extractive industries (about 10 percent of GDP and 50 percent of export earnings), and on hydropower to generate almost all of its energy (World Bank, 2016e). Its per capita GNI of US$1,250 (2014) is the second lowest in CAM, and it is the most import-dependent country in the sub-region with imports that equal 88.1 percent of GDP (2014) (World Bank, 2016a; 2016f). Moreover, economic growth continues to be hampered by political instability, weak economic governance, and high levels of perceived corruption, although efforts since the large-scale political unrest in 2010 have resulted in some improvements (World Bank, 2015b).

Ranking at 120th in the world for HDI (0.655) in 2014, the Kyrgyz Republic has a medium human development status (UNDP, 2015c) but second lowest in CAM. Only 35.5 percent of the Kyrgyz Republic's growing population of 5.8 million people dwell in cities (World Bank, 2015a). There are considerable urban-rural disparities and inequalities between men and women (UNDP, 2014; 2013a). Despite slowly sinking unemployment rates, political instability and food price increases have reversed earlier gains in poverty reduction. The poverty rate increased from 31.7 percent in 2009 to 37 percent in 2013 (World Bank, 2016e).

The Kyrgyz Republic is the second smallest country in CAM, covering a sparsely populated area of 199,949 km^2 that entirely consists of the Tian Shen mountain range and its valleys and basins (World Bank, 2013a). Only 6.7 percent of the territory is arable land, and 5.1 percent is forest area, while roughly half of the country is used as mountain pasture (World Bank, 2015a). High priority environmental issues include soil salinization in irrigated lands and water pollution (World Bank, 2007a).

CURRENT NATIONAL IGE PROGRESS

The Kyrgyz Republic has prioritized sustainable economic development. Following the Rio+20 Conference, a National Sustainable Development Strategy (NSDS) for 2013-2017 was enacted by presidential decree in 2012. The strategy recognizes persistent poverty and regional disparity as key challenges, and it takes a comprehensive approach of inclusive development that focuses on better governance, institutional decentralization, and improved implementation of the rule of law (NCSD, 2012).

While the Kyrgyz Republic has not formally adopted IGE, its NSDS has set objectives to improve the capacity of the governmental and legal system to achieve a wide range of green development goals. It aims to protect and better use its water system, to improve irrigation and agriculture production while protecting forests and ecosystems, to increase energy productivity while increasing hydropower for more electricity exports, and to reduce pollution and manage waste (NCSD, 2012). Supportive policies in the strategy focus on improving education and health care, shifting incentives to reduce natural resource depletion, and promoting energy efficiency, amongst others (NCSD, 2012).

To ensure implementation of the NSDS, the government has established a National Council for Sustainable Development, an inter-agency Climate Change Coordination Committee led by the Vice-Premier, and a number of targeted agencies, such as the Centre on

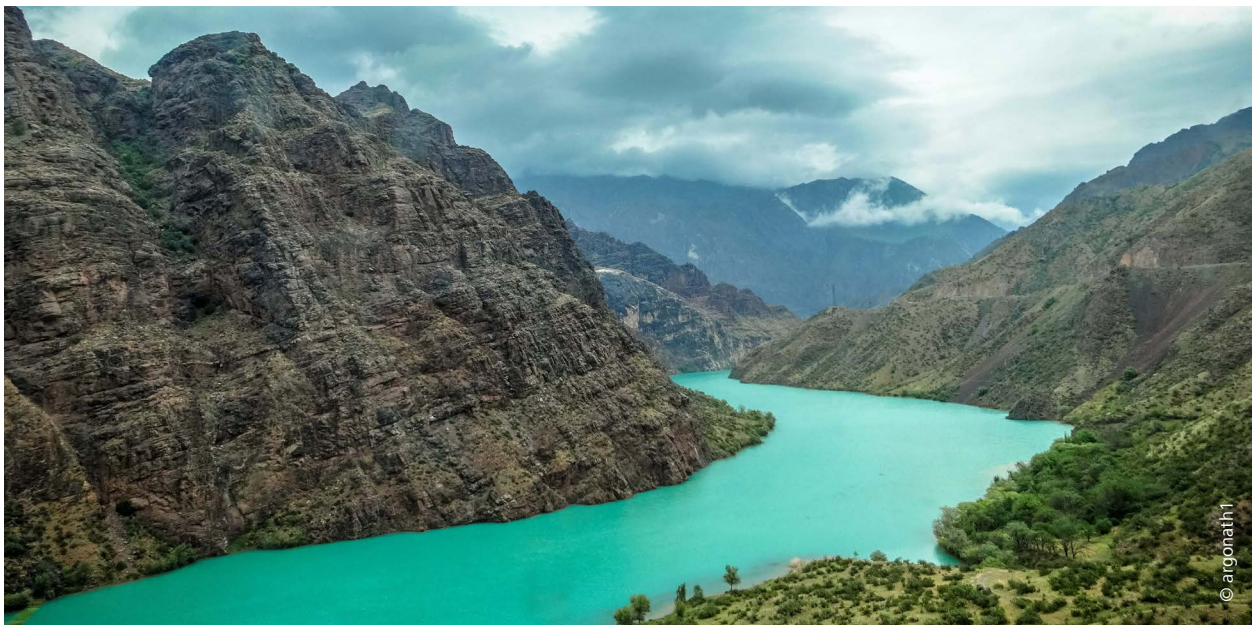
the Problems of Using Renewable Energy Resources within the Ministry of Energy (ECOSOC, 2015).

In 2016, the Kyrgyz Republic joined PAGE as a partner country. Initial work will likely include an IGE stocktaking, followed by the development of a detailed IGE strategy. In addition to the PAGE partner organizations, a number of other international organizations are engaged in IGE related projects in the country, including the World Bank Group, the ADB, United States Agency for International Development (USAID), the Food and Agriculture Organisation (FAO), EU, and German Development Cooperation (GIZ) (World Bank, 2013a).

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN THE KYRGYZ REPUBLIC

Major IGE opportunities exist in the agriculture and energy sectors. In the agriculture sector, investment in irrigation systems, access to modern farming equipment, and information for farmers on how to improve their productivity in organic agriculture can all help to improve rural incomes and to reduce the amount of food imports. These factors will gain importance in the coming years, as climate change is predicted to cause changing rain patterns, declining water flows from glaciers after 2030, and more natural disasters, such as flooding and mud slides, all of which will negatively affect agricultural production capacity (World Bank, 2013a). In the energy sector there is strong potential for decentralized renewable energy technologies such as small hydropower stations on mountain rivers, solar and wind energy, and biogas plants (SERN, 2012). Currently, hydropower supplies more than 80 percent of all locally-generated electricity (ADB, 2013a) and in 2014, the government secured grants and loans from the ADB to update the Toktogul hydroelectric power plant (CAREC, n.a.). Investment in additional dams could help to create export revenues and reduce seasonal variability of electricity production, which is expected to become more severe as annual rainfall patterns shift as a result of climate change (World Bank, 2013a). However, as noted previously in this report, the benefits of hydropower generation need to be balanced against the potential adverse social and environmental impacts that can result from such activities.

The Kyrgyz Republic's main challenge for IGE development relates to the mining sector. The government hopes to expand the industry, increase exports, and create jobs, but also recognizes the need not to overly deplete natural resources and to reduce the pollution from its mining activity (NCSD, 2012). To put this delicate balance into practice and develop



The Toktogul reservoir supplies water to the Toktogul hydroelectric power plant. The Kyrgyz Republic's mountainous terrain and ample water resources make the development of hydropower a significant IGE opportunity.

more sustainable economic activities that substitute mining will be of vital importance in the transition to IGE.

A number of cross-sectoral challenges also exist. These include political instability, weak rule of law, corruption, and emigration of the skilled labour force (and resulting dependence on remittances from abroad) (ADB, 2014b). Additionally, even though there is a formal institutional structure to support low-carbon, climate-resilient development, effective and efficient collaboration among the relevant ministries and agencies has yet to be achieved (World Bank, 2013a).

MONGOLIA

Driven by (largely foreign) investments in the mining sector, Mongolia has experienced relatively strong economic growth over the past decade. It has a gross national income per capita of US$4,280 (2014), with an export-oriented economy that is extremely dependent on its vast mineral resources (primarily copper, gold, and coal) (PAGE, 2014). Mineral commodities account for almost 20 percent of GDP and about 80 percent of exports, which makes the economy vulnerable to price fluctuations and dependent on demand from China, where almost all exports go (UNDP, 2013f). The relative importance of agriculture has decreased, but it still contributes 15.8 percent of GDP (2014) and 33 percent of employment (2011) (World Bank, 2016k; 2016o). Almost all energy is produced from coal, which contributes to serious air pollution in the winter (World Bank, 2015a).

Mongolia had an HDI of 0.727 in 2014 (UNDP, 2015c). In spite of decreasing unemployment and poverty rates, 27.4 percent of the population (2012) still remains below the national poverty lines (UNDP, 2013f). Considerable income inequalities and a strong urban-rural divide show that many rural poor involved in livestock and agriculture have not profited from the mining boom. Around 44 percent of the urban population has no access to improved sanitation, and in rural areas it is 65 percent (World Bank, 2015a).

With a large area of about 1.56 million km^2 and a growing population of 2.9 million, Mongolia is the world's most sparsely populated country and has the smallest population in CAM (UNDP, 2015a). As a result of mining and herding practices, the country faces a number of environmental problems, including severe air pollution in Ulaanbaatar, mismanagement of water supplies, water pollution, land degradation and desertification (PAGE, 2014)

Mongolian capital of Ulaanbaatar suffers from severe air pollution due in large part to a reliance on coal for heating and electricity generation.

CURRENT NATIONAL IGE PROGRESS

Mongolia's Comprehensive National Development Strategy for 2008-2021 laid the basis for a range of long-term development programmes that take account of IGE issues. The Government of Mongolia has established goals for 2030 to increase renewable energy by 30 percent, increase waste recycling by 40 percent, increase investments to protect the environment by 30 percent, reduce pollution, protect natural capital, provide more green jobs, improve productivity and livelihoods, and obtain the needed technology (MEGD, 2014).

Government ministries have begun working together to shift towards IGE since Mongolia joined PAGE in 2013.[7] This included the use of quantitative analysis to develop a national Green Economic Policy Plan in 2014, which focuses on energy, solid waste, water, and building improvement.[8]

The Ministry of Environment, Green Development

Putting Sustainability at the Centre of Development

The Partnership for Action on Green Economy (PAGE) is a collaboration between five United Nations agencies - UNEP, International Labor Organization (ILO), United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO) and United Nations Institute for Training and Research (UNITAR) – that seeks to advise national actors on achieving sustainable economic growth. Since its creation in 2013, PAGE has worked closely with governments, private sector and civil society to provide analytical support, policy analysis and technical assistance to countries and regions seeking to develop an inclusive green economy (PAGE, 2016). As of 2016, there were eight official PAGE countries: Burkina Faso, China (Jiangsu Province), Ghana, Mauritius, Mongolia, Peru, Senegal and South Africa. PAGE's mandate supports the 2030 Agenda, specifically the SDGs related to the economy, jobs, environment, climate change and partnerships and is supporting countries in achieving their environmental objectives (PAGE, 2016).

and Tourism is the lead government institution for promoting the implementation of Mongolia's Green Development Policy. It works with the Ministries of Economic Development, Mining, Energy, Population Development and Social Welfare, Health, Industry and Agriculture, Labour, and a number of other agencies to coordinate activities that support the green agenda. In addition, there are also private sector groups involved in supporting IGE activities. They include the Mongolia National Chamber of Commerce and Industry, Mongolia Employers Federation, Confederation of Mongolian Trade Unions, Councils of Water Policy and Renewable Energy, and several commercial banks. For example, the Mongolian Bankers Association, which represents the country's banks and financial institutions, has been instrumental in the creation of a Green Credit Fund, which aims to promote sustainable finance by supporting projects that have positive social and environmental impacts.

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN MONGOLIA

Mongolia is facing a range of challenges, especially in energy and mining, that a transition towards IGE could help address. A major IGE opportunity exists in the renewable energy sector, as Mongolia has huge potential for the production of solar, wind, and hydro-generated electricity (IRENA, 2016). A shift to renewables could have cross-cutting benefits; it can help to improve human health and well-being by reducing air pollution in the cities, and the provision of solar home systems has already been very successful in providing electricity to many households living in areas without access to the electrical grid. At the same time, significant expansion of the renewable energy sector could provide surplus electricity that could be used to generate export earnings. Mongolia's first commercial wind farm, Salkhit, began producing electricity in 2013 and generates approximately 5 percent of the

Salkhit wind farm generates approximately 5 percent of Mongolia's electricity.

country's electricity (Pyrkalo, 2013). However, there is

far greater potential to be realized: one study estimates that Mongolia's combined potential wind and solar output could be enough to meet China's total demand for electricity in 2030 (IRENA, 2016).

Despite presenting opportunities, a switch to renewable energy also presents a challenge, as Mongolia is largely dependent on oil imports from the Russian Federation, the majority of the electricity consumed is coal generated, and coal provides 90 percent of the heating needs (ADB, 2013a). The country has large proven coal reserves, and coal power is subsidized by the government. The use of coal for heating, electricity generation, and in the mining sector has led to serious air quality issues – UlaanBaatar has some of the worst air quality in the world (IRENA, 2016).

Mining also represents a significant IGE challenge for Mongolia. While the sector is a major contributor to the national economy, and draws significant investment, it is also water intensive and produces hazardous waste and pollution. The government of Mongolia will need to find a way to use mining revenues to help develop greener sectors of the economy. Investment and regulatory changes can help support such a shift. Changes in energy pricing, strengthened pollution regulations, water management processes, and new building quality requirements all offer good potential in this regard.

TAJIKISTAN

Tajikistan has experienced rapid economic growth - an average of 7.5 percent a year over the past decade - but still has the lowest gross national per capita income in CAM at US$1,080 (2014) (World Bank, 2016a). It has high levels of perceived corruption and an import-dependent economy that heavily relies on remittances from labor migrants abroad, mainly in the Russian Federation. As remittances from these workers made up over 40 percent of GDP in 2014, economic recession in the Russian Federation has had a negative effect on Tajikistan's economy (World Bank, 2015c). Other important sectors are agriculture, which contributes 27 percent of GDP and about half of employment, as well as some light industry, hydropower facilities that provide nearly all of Tajikistan's energy, and a large aluminium plant (World Bank, 2016g).

Turbines at the Nurek hydropower plant, which supplies more than 70 percent of Tajikistan's electricity.

Greening the Silk Road

The Green Ecological Silk Road Investment Fund is the first private equity fund for eco-friendly projects along the New Silk Road (Xinhua Finance, 2015). Launched in China in 2015, the fund raised US$48 billion in its first round of fundraising to finance investments in solar panel manufacturing, clean energy and ecological remediation in China and other Central Asian countries (Zhu, 2015). The Green Ecological Silk Road Fund has pledged to plant 1.3 billion trees along the Silk Road over the next ten years and invest 5 billion yuan in a solar panel industrial chain corridor between Beijing and Hebei province (Zhu, 2015). The Green Ecological Silk Road Investment Fund was started by a number of Chinese companies, including China Oceanwide Holdings and Elion Resources Group, which marks the commitment of the private sector to sustainable economic growth in the region. The creation of the fund also represents an important effort to address the financial requirements of a transition to a green economy that could lead to similar financing vehicles in the CAM region in the future.

Tajikistan's social development is the lowest in CAM countries, with an HDI of 0.624 in 2014 (UNDP, 2015c). And while poverty has been greatly reduced over the last 15 years, the poverty rate is still about 32 percent (UNDP, 2014). The country's quickly growing population of 8.3 million people is the most rural (73 percent rural and 27 percent urban) and youngest in CAM (median age 22 years) (WHO, 2015). Heating and sanitation vary according to location, with approximately 70 percent of the population suffering from extensive power shortages during winter (World Bank, 2016g).

Tajikistan is the smallest country in CAM, and its area of 143,000 km^2 is predominantly mountainous. Only 6.1 percent of it is arable land and 2.9 percent forest area, and grazing is only possible on 27.7 percent of the territory (UNDP, 2013b). Like in the other Central Asian countries, many environmental problems can be linked to Soviet-era agriculture policies and include salinization of irrigated lands and soil erosion caused by over-grazing (World Bank, 2007b).

CURRENT NATIONAL IGE PROGRESS

Tajikistan's National Development Strategy for the period to 2015 aims to achieve "sustainable economic growth" with a strong focus on institutional reforms, poverty reduction, and development of the water sector, but it puts little emphasis on other environmental aspects (Tajikistan, 2007). Consequently, the Tajik government is not as involved in sub-regional green development associations as its neighbouring countries. However, it ratified the Kyoto Protocol in 2008 and in 2010 the UNDP-UNEP Poverty Environment Initiative (PEI) was launched in Tajikistan, and has been influential in promoting international cooperation in water management (World Bank, 2013b; UNESCO, 2013).

Most environmental initiatives in Tajikistan focus on climate change and water management. In 2003, a National Plan on Climate Change Mitigation and Adaptation was adopted. It focuses on water management, energy efficiency, protection of agricultural land, forest management, and transportation infrastructure (Tajikistan, 2003). In 2010, with support from donor and financial agencies, the government set up a Pilot Program for Climate Resilience (PPCR). Its investments target water management and hydroelectric infrastructure, institutional planning capacities, and resilient land management (CIF, 2016).

Improving the livelihoods of the poor through natural resource management

The UNDP-UNEP Poverty Environment Initiative (PEI) has been working on placing pro-poor economic growth and environmental sustainability at the core of national economic policies since 2005. Since a large part of the world's poor depend on the environment for their income, adequate natural resource management can directly contribute to poverty reduction while simultaneously addressing ecosystem preservation. PEI assists governments with tools, talents and techniques to improve natural resource management by increasing institutional capacity, mainstreaming poverty and environmental objectives into decision-making in governments (UNDP-UNEP, 2016). In 2015, PEI provided technical and financial support to 24 countries in Latin America, Africa, Europe and Asia, including Tajikistan and Kyrgyz Republic (UNDP-UNEP, 2016). Active since 2010 in Tajikistan, where the poor rely primarily on agriculture, PEI has worked to include environmental actors in economic planning and poverty-environment tools in the national civil servant training curriculum, among others. PEI's activities in Kyrgyz Republic began in 2011 and have focussed on assessing ecosystem services and improving environmental-economic accounting.

IGE is expected to receive more attention in the National Development Strategy for 2016 to 2025. Alongside international institutions and initiatives like PEI, there are a number of important domestic proponents of inclusive green economy, including the Tajik government's Committee for Environmental Protection, the State Agency for Hydrometeorology, several ministries, and the NGO Foundation to Support Civil Initiatives.

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN TAJIKISTAN

The country's National Review "Towards a 'Green' Economy in Tajikistan" (Rio+20, 2012) identified the rational and efficient use of natural resources as a priority, especially in the areas of agriculture and industry. Better management of the abundant water supply from its mountains, for example, has great potential to improve energy and food security for Tajikistan.

By expanding its hydropower production, Tajikistan could reduce the extensive electricity shortages that it frequently experiences during winter and increase electricity exports during the rest of the year. Although hydropower is already the main source of electricity, Tajikistan uses only 3 to 4 percent of its technical potential (Tajikistan, 2012). Much of the rural population still lacks access to electricity, since hydropower is quite variable and production is low in the winter (World Bank, 2013b). The government is taking different approaches to increasing hydropower production, while simultaneously trying to decrease logging of mountain forests, reduce greenhouse gas (GHG) emissions and lower its energy imports from neighbouring countries (Nabiyeva, 2015). In addition to hydropower, the country has favourable conditions for solar power generation in the mountainous areas and East Pamir, which could be harnessed to satisfy 10-20 percent of the national energy demand (UNECE, 2013b).

In the agriculture sector, better water management could improve productivity and help to develop related food processing that can increase jobs and exports. Irrigated agriculture accounts for 90 percent of the agricultural production in the country, but it has low water productivity (ADB, 2013b). Measures to improve water productivity include both constructing water reservoirs and shifting to more water-efficient irrigation methods.

The main cross-cutting challenges for IGE development are a lack of expertise, technologies and investment, and the trans-boundary effects of reservoirs and dams (Rakhmatov, 2013), all of which would benefit from better sub-regional cooperation, trade, and access to regional and international financial institutions (World Bank, 2013b). Government water management programmes also have to deal with increasing variability of water supply across seasons and over time, as climate change is expected to lead to shifting rain patterns and continued glacial melt, which causes a decrease in water availability in the long run (Zemp and Haeberli, 2007).

TURKMENISTAN

Turkmenistan has the second highest GNI per capita of the CAM countries. Its economy is based largely on fossil fuels that produce all of its energy and account for about 35 percent of GDP and 90 percent of exports (World Bank, 2016a). It has the highest industry (48.4 percent of GDP) and export share in CAM (73.3 percent of GDP), with 68 percent of its exports going to China (World Bank, 2016h; 2016i). Turkmenistan has experienced rapid economic growth of, on average, 11.1 percent per annum from 2005 to 2015, which it was able to sustain largely by offsetting declining oil prices with increased oil and gas production (World Bank, 2016j). Although agriculture represents only about 14 percent of GDP, it continues to employ almost half of the country's working population (World Bank, 2016k).

Turkmenistan has an HDI of 0.688 (2014) and a growing population of 5.3 million people, the second smallest in CAM (UNDP, 2015c; WHO, 2015). The government subsidizes electricity, natural gas, petrol, water, and salt, but despite its wealth, only half of the rural population has access to reliable clean water and life expectancy at birth is the lowest in CAM, at only 65 years (World Bank, 2016j; 2015a).

Turkmenistan covers an area of 488,100 km^2 that is 80 percent desert, so most people live in the southern,

Turmenistan has large reserves of natural gas, which can be seen here burning in the Derweze Crater. A switch from coal to natural gas is an important part of Turkmenistan's National Strategy on Climate Change.

eastern and north-eastern oases (UNDP, 2013c). Two-thirds of its territory is used as pasture, while only 4.1 percent is arable land and 8.8 percent forest area (World Bank, 2015a). Turkmenistan is prone to drought and desertification. The northern part of the country lies within the Aral Sea zone, where salinization of water and soil poses a serious challenge (UNDP, 2013c).

CURRENT NATIONAL IGE PROGRESS

Turkmenistan's National Program of Socio-Economic Development for 2011–2030 (NPSD) does not formally adopt the IGE, but it incorporates important aspects of it. The NPSD mainly aims for inclusive economic growth while preserving economic independence, modernizing the country's infrastructure, and promoting foreign direct investment (World Bank, 2016j). But it also includes goals to reduce dependence on oil, gas, and other mineral exports, increase agricultural and other domestic production, increase the share of renewable energy, and protect the environment (World Bank, 2013c).

The 2012 National Strategy on Climate Change provides more information on Turkmenistan's policies for a resilient and low-carbon development. Its main priorities for reducing GHG emissions are to shift from coal to natural gas, develop renewable energy sources, increase energy efficiency, and improve agriculture and forest management (Turkmenistan, 2015). The main emphasis of the strategy is on improving economic development, which takes climate change into account, but does not explicitly consider a shift to IGE. However, Turkmenistan's economic development goals can also help the country move towards IGE.

Based on the NPSD and climate change strategies, Turkmenistan is strengthening its government structure to address sustainability issues. It has established a State Committee on Environmental Protection and Land Resources, a National Institute of Deserts, Flora and Fauna, the Center for Ecological Monitoring, and the Center to Combat Desertification. The Turkmenistan State Commission on Climate Change is tasked with coordinating the work of various ministries in these areas (World Bank, 2013d).

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN TURKMENISTAN

A shift to IGE can help Turkmenistan reduce its dependence on fossil fuels, diversify its economy and improve the well-being of its population. Two of the most important sectors for a transition are sustainable water management and energy production and consumption.

Turkmenistan identifies better water management as part of its adaptation to climate change and its aim to improve agricultural production. However, water management presents a major challenge. Usage is high, and Turkmenistan is a downstream user, depending primarily on rivers flowing in from other countries for its water supply. Additionally, climate change is projected to lead to more floods and landslides in the short run and less water supply in the long run (World Bank, 2013d). To address this, the government aims to make irrigation more efficient and to protect forestlands and watersheds to assure better local water availability (Turkmenistan, 2015).

Turkmenistan has high potential for improving energy efficiency and increasing renewable energy sources. In particular, the construction sector offers opportunities to incentivise better energy efficiency, as the housing stock increased by 45 percent between 2000 and 2007 without any consideration of the energy performance

of the buildings (UNDP, 2013d). Turkmenistan has significant potential for both solar and wind energy production due to high solar radiation and suitable wind conditions along the Caspian coastline and in the large central desert area (IRENA, 2013). Energy efficiency and renewable energy can help Turkmenistan to create new industries, expertise, and jobs, as renewable energy sources tend to employ more people per MW of installed capacity than conventional sources (UNECE, 2013a).

The main cross-cutting challenge for IGE development is governance, as a lack of coordination among ministries and ineffective policy implementation and enforcement hinder reforms (World Bank, 2013d). Similarly to Kazakhstan, the dependence on oil and gas for government revenues presents a significant challenge, as do large subsidies for natural gas and electricity, which also reduce the competitiveness of renewable energy in the country (Nabiyeva, 2015). Low oil prices will reduce the amount of funding available for education, health, social safety nets, and investments in green sectors. However, sinking oil revenues could also offer the opportunity to create more support for economic diversification and investment in water management, renewables, and energy efficiency.

UZBEKISTAN

Robust GDP growth since the mid-2000s has increased Uzbekistan's gross national income per capita to US$2,090 in 2014 (World Bank, 2016a). Its economy is based on exports of natural gas, gold, copper, and cotton, and on remittances from labor migrants (12 to 15 percent of GDP) (UNDP, 2013e). However, at the same time, it is more domestically oriented than many of the neighboring countries (World Bank, 2016l). As a result of its rigid trade regime and state interventions aiming for self-sufficiency in food and energy resources, its trade share of 59 percent of GDP is the lowest among the CAM countries (UNDP, 2013e; World Bank, 2016m). Approximately 80 percent of electricity is produced from fossil fuels and the remaining 19.5 percent from hydropower (World Bank, 2015a).

Uzbekistan has a HDI of 0.675 (2014) and the largest population in CAM at 30.7 million (UNDP, 2015c). Due to unemployment rates above 10 percent, relatively low wages, and very high inflation averaging 18.3 percent per year in the last decade, many Uzbeks have migrated to Russia and Kazakhstan for work (World Bank, 2016n). About 16 percent of the population lives below the poverty line, 75 percent of them in rural areas (UNDP, 2013e).

Uzbekistan covers 447,400 km^2 of mostly arid land, with most of its population living in the broad and intensely irrigated river valleys (Makhmudovich, 2006). Like the other CAM countries, Uzbekistan has relatively little forest (7.7 percent of the land area) and arable land (10.1 percent of land area), while most of the territory is used as pasture (51.7 percent)

Unsustainable use of water resources for agriculture has resulted in the dramatic shrinking of the Aral Sea.

CURRENT NATIONAL IGE PROGRESS

The government of Uzbekistan has not formally adopted an IGE programme, but its Second National Communications to the UNFCCC in 2008 identified several IGE-related issues to be addressed. Uzbekistan has passed a number of laws to promote the country's transition following the National Strategy on Sustainable Development, including sector specific policies on energy efficiency, renewable energy

production, water resource management, sustainable agriculture, and diversification of the economy. The government aims to take advantage of technological improvements developed elsewhere to modernize the economy (World Bank, 2013e).

Uzbekistan's energy goals are to reduce fossil fuels to 50 percent of the total production and to achieve at least 11 percent solar energy production by 2050.[9] To accomplish this, the government has invested in a major photovoltaic power plant – the first non-grid photovoltaic power park in the sub-region – with additional funds from the Asian Development Bank (ADB) (Nabiyeva, 2015). It is also promoting transportation efficiency, as well as more efficient housing construction that includes passive solar heating and the use of renewable energy (CENEf, 2013). In addition, Uzbekistan's government has announced it will build three more 100 MW solar power plants and a large amount of wind turbines by 2019 (Jegelevicius, 2015).

A primary goal of the Uzbek government is to improve water management to tackle pollution. In response to the disastrous shrinking of the Aral Sea, it introduced a series of laws to reduce the use of herbicides and fertilizers since its independence (FAO, 2003). The government is also investing in irrigation, conservation, and hydropower. In addition, it is improving sewage treatment and promoting waste recycling (ADB, 2012b).

Uzbekistan has established a Cabinet of Ministers to coordinate climate activities and address related development and social welfare issues. The Ministry of Agriculture and Water Resources and the Ministries of Energy, Health, and Economy are among those involved. The State Committee for Nature Protection is responsible for protecting the environment and natural resources (World Bank, 2013e).

MAJOR IGE CHALLENGES AND OPPORTUNITIES IN UZBEKISTAN

Two important areas that can help Uzbekistan to diversify its economy, create jobs and improve public health are agriculture and water management. Uzbekistan has some natural resources, including minerals and fossil fuels that can support economic growth if managed appropriately. However, Uzbekistan is aiming to diversify in order to make economic activities more sustainable in the long run. For example, the Uzbek government is targeting energy efficiency with the objective of exporting energy to its neighbours (OECD/IEA, 2014). The government is also planning on growing more non-timber forest crops (e.g. nuts, fruits, mushrooms, herbal medicines, and tanning and dyeing agents) and wants to increase eco-tourism (World Bank, 2013e). This can generate income and help protect important watershed ecosystems. In addition, policies to reduce water pollution and improve water quality have a positive effect on agricultural productivity and the health of the population.

In Uzbekistan, policy integration and coordination is a major challenge. Uzbekistan has made initial steps to green the energy sector, adopted energy efficiency standards, and strengthened environmental regulations, but could benefit from systematically integrating this work across different sectors. This would mean more coordination of the work on water with efforts to improve agricultural production methods and increase renewable energy production.

OVERVIEW OF IGE DEVELOPMENT IN CAM SUB-REGION

Based on the country profiles presented above, CAM countries share some common socio-economic and environmental challenges. For example, lack of economic diversity and over-dependence on fossil fuels, high rates of rural poverty and unemployment, low standards of living, and increasing social inequality (particularly in terms of the urban-rural gap in incomes and access to basic services) exist to varying degrees across the sub-region. In particular, these countries are facing increasing water scarcity, inefficient use of non-sustainable energy, agriculture and food security issues, and poor waste management. It is estimated that Central Asia's natural resources are eroding rapidly and the focus countries' GDPs would be substantially lower if adjusted for natural capital depletion (OECD, 2012).

To move towards a more sustainable growth model that is capable of improving the environmental performance of existing economies, environmental goals must be included in sectoral policies and national strategic development frameworks. The 2030 Agenda, for example, with its focus on inclusive and sustainable economic growth and detailed set of targets and indicators, provides a strong framework from which to develop national strategies, as well as additional political momentum to incorporate environmental concerns into CAM's development programmes. Turkmenistan, for example, has been working to identify which indicators the country would adopt as it moves towards achieving the SDGs, and other countries are shifting their sustainable development strategies around the SDGs.

WATER MANAGEMENT

Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan all rely on water from the transboundary rivers of Amu Darya and Syr Daria. These two waterways divide the region into upstream (the Kyrgyz Republic and Tajikistan) and downstream (Kazakhstan, Turkmenistan and Uzbekistan) countries - a division that gives each country varied access to water and provides a strong rationale for shared management of the resource (Fedorenko, 2014). Sub-regional cooperation to better manage water resources would positively impact both water security and water quality. A number of sub-regional initiatives have approached water management issues from this perspective, albeit with limited success over the past twenty years. However, bilateral agreements indicate collaboration is occurring.

The sub-region faces serious risks related to water security. Two Central Asian countries – the Kyrgyz Republic and Tajikistan – have adequate water supplies, but their surpluses are small relative to the needs of the whole sub-region (ICG, 2014). Their water management efforts are primarily focused on meeting their own needs in agriculture and hydropower generation and avoiding other risks, such as flooding. Conversely, Kazakhstan, Uzbekistan and Turkmenistan face deterioration of their river basins (UNDP, 2004) and little surface runoff (Orlovsky and Orlovsky, 2002) throughout the year. Mongolia also faces water scarcity in key industrial and population centres, as the energy and mining sectors consume high amounts of water, and climate change has resulted in desertification of large areas and the loss of surface water resources (ADB, 2014a). As 90 percent of the people in Central Asia depend on water originating from mountain glaciers (Mountain Partnership, 2012), managing sub-regional freshwater supply also requires coordinated mountain ecosystem management to protect the watersheds. This includes protecting forests and biodiversity and setting up proper water storage systems to seasonally manage water supplies. Water security issues will be exacerbated in the medium- and long-term by climate change, and balancing the costs and benefits among the countries involved remains an ongoing challenge.

In addition to water security, water quality issues have become increasingly important, particularly with respect to treatment and processing in urban settings. Rapid urban growth in CAM countries has increased the demand for water, while aging water treatment facilities require upgrading and expansion (GWP, 2014).

With the majority of Central Asia's water supply originating from glaciers, mountain ecosystem management is a key part of sub-regional water management.

Governments in the sub-region also face the challenges of determining the applicable water treatment technologies, securing financing, and designing and implementing management systems, among others. Governments certainly face challenges in managing water resources at the domestic level, but sub-regional solutions are required due to the trans-boundary nature of waterways. Pollution that originates upstream, for example, can often have serious downstream impacts (Bekturganov et al., 2016), but joint monitoring, water quality assessments, and data sharing require a high level of cooperation and coordinated planning.

In the post-Soviet era, a number of initiatives have aimed to improve water security in the region with varying degrees of success. The International Fund for the Aral Sea (IFAS), for example, was established in 1993 to address joint management of water resources in Central Asia. While all five Central Asian states joined the initiative, funding decreased considerably in the 2000s and with it, the level of activity and perceived effectiveness of the IFAS bodies (Weinthal, 2003).

Water treatment and management technology upgrades can help CAM countries to better manage their water resources.

Multiple donors, including UN agencies, the European Commission, multilateral financial institutions, and individual donor countries have also supported the development of integrated water resource management plans (IWRMs) in Central Asian countries. The Environment and Security Initiative (ENVSEC), for example, has tried to address environmental pressures in conflict-prone areas of Central Asia, the Caucasus, and South-Eastern Europe since 2003.[10] It has implemented a series of projects on trans-boundary water management, access, and distribution problems in places like the Ferghana Valley, the Amu Darya river basin, and the Eastern Caspian, among others. Though a relatively small stakeholder, it has played an important role as a third party in water management issues in the sub-region, but as with IFAS, it has also faced funding challenges (Gaia Consulting, 2010; Borthwick, 2009). Another recent effort is the Central Asia Energy-Water Development Program (CAEWDP), managed by the World Bank with multi-donor trust fund contributions from Switzerland, the United Kingdom and the European Commission. Since 2010, the CAEWDP has focused on energy and water security and aims to address the challenge of balancing the

interests of upstream and downstream states, while supporting increased agricultural production and addressing long-term sustainability implications. The CAEWDP began to provide technical assistance and investment identification to CA countries in 2014 (World Bank, 2014a).

Although attempts to improve collective management of water in the sub-region have been made, an effective multilateral framework for addressing upstream and downstream interests has yet to evolve, and competing uses of water for hydropower upstream and irrigation, industrial, and ecosystem demands downstream remain a major challenge (ICG 2014).

Nevertheless, many bilateral water management agreements or treaties have been concluded between individual countries in the region over the last two decades.[11] And while such agreements have tended to lack stability or sustainable outcomes, often due to different national priorities, they do constitute a step in the right direction, and can sow the seeds of more widespread cooperation in CAM. The International Crisis Group, for example, has proposed that Central Asian countries should focus on well-constructed and manageable step-by-step development options, such as bilateral agreements between willing states, investments in infrastructure modernization, training of technical specialists, and water management projects, accompanied by the integration of governance and anti-corruption policies (ICG, 2014).

Such measures have the potential to help the CAM countries to achieve SDG 6, which pertains to ensuring availability and sustainable management of water and sanitation for all. In particular, the target is to improve water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals and materials, while also reducing water scarcity and increasing water-use efficiency.

ACCESS TO SUSTAINABLE ENERGY

The CAM countries are largely dependent on fossil fuels, both as producers and consumers. As described in Section 2, some of the countries in the sub-region – Turkmenistan, Kazakhstan and Uzbekistan – export significant amounts of fossil fuels while others – the Kyrgyz Republic, Mongolia, and Tajikistan – are net importers. However, while importers of fossil fuels, the Kyrgyz Republic and Tajikistan do generate significant amounts of hydropower.

Sustainable energy policies have been central to development agendas in the CAM sub-region, and have mostly focussed on improving energy efficiency and developing renewable energy sources. Driven largely by the donor community and domestic demand pressures, the CAM countries have all pursued energy effectiveness/saving/efficiency programmes and made efforts to develop renewable energy sources, with the most prevalent being hydro, followed by low levels of wind and solar. While there is no comprehensive sub-regional sustainable energy framework, most of the CAM countries have set ambitious targets and goals concerning energy efficiency and Renewable Energy Sources (RES), with more emphasis and better economic rationale for the former. All of the CAM countries have submitted Intended Nationally Determined Contributions (INDCs) under the United Nations Framework Convention on Climate Change (UNFCC). Such efforts contribute to the realization of SDG 7, which aims to ensure access to affordable and clean energy, as well as doubling energy efficiency, by 2030. Making an effort towards fulfilling SDG 7 also has the potential to help the sub-region make progress towards responsible consumption and production (SDG 12) and climate change mitigation (SDG 13).

The CAM sub-region has high potential for RES development, including solar power generation.

While hydropower is the leading renewable energy source in the sub-region, it remains the most controversial (including for run-of-river projects) because of the potential negative environmental and social impacts related to dam construction and flooding, and impacts to downstream users. The Kyrgyz Republic and Tajikistan are the largest hydro producers (and also the weakest economies) in the sub-region. As of 2015 they were proceeding with five large hydroelectricity projects[12] that downstream countries Kazakhstan and Uzbekistan have opposed due to concerns over their effects on water supplies (Pomfret, 2012). This example of the interconnectedness of two key issues – water and sustainable energy – highlights the need for better sub-regional cooperation and the compounding positive effects that such cooperation could bring.

In addition to hydropower, development of wind and solar projects in the sub-region is very promising. The European Bank for Reconstruction and Development (EBRD), UNDP, the European Commission and other donors and partners continue working to develop production capabilities in partnership with relevant national agencies and institutions in Kazakhstan, the Kyrgyz Republic, Mongolia, and Uzbekistan. Although there is no sub-regional programme or framework on renewable energy, there is considerable exchange and information-sharing regarding RES development, as well as existing investments. Cooperative planning may enable the CAM countries to find ways to import more renewable energy from other CAM countries that have surplus renewable capacity (e.g. hydropower in Tajikistan or wind power in Mongolia) and would benefit from the associated economies of scale coming from increased trade. For example, Kazakhstan, a country with large fossil fuel reserves that does not meet its domestic energy demand, could benefit from the sub-region's hydropower (ADB, 2013b). Where renewable production is close to a border, exporting energy may also be more efficient than using it domestically, especially if the production sites are far from domestic centres of demand.

Central Asian and Mongolian governments have established energy efficiency programmes, but in many cases have struggled with implementation. Challenges have included lack of financing, insufficient technical capacity, and ineffective governance (Nabiyeva, 2015). Overcoming these roadblocks will require governments to reform and restructure energy tariffs, taxes, subsidies, and regulations in order to create incentives for industries and individuals to decrease energy consumption and increase energy efficiency. Technical capacity building is also required. In addition, governments must make efforts to coordinate energy-related policies throughout the sub-region to ensure that the incentives used among CAM countries are consistent and will produce attractive yields compatible with the real value of shifting to renewables (i.e. accounting for lower GHG emissions) and encourage investments into clean energy sectors. Unfortunately, unstable national currencies, shrinking national budgets, and associated economic uncertainties have slowed the pace of energy sector reform.

AGRICULTURE AND FOOD SECURITY

Agriculture is one of, if not the most, vulnerable sector in most of the economies of the sub-region. While only 20 percent of Central Asia's area consists of arable land, agricultural production provides the main source of export revenues for most of these countries, except for fossil fuel-producing Kazakhstan and Turkmenistan (Bobojonov and Aw-Hassan, 2014). More than half of the sub-region's growing population lives in rural areas, where they rely on agriculture for most of their income (UNECE, 2011).

Agriculture is an important sector of the economy in CAM countries, and particularly so in rural areas.

Agriculture accounts for a sizable percentage of the sub-region's GDP (see table 1) Kazakhstan's agriculture accounts for 26 percent of total employment, yet only 5 percent of GDP and is one of the most vulnerable sectors of the economy. Agriculture employs close to 48 percent of the population in Turkmenistan and contributes 15 percent of the GDP in the country. Similarly, in Mongolia agriculture accounts for nearly 49 percent of employment while contributing 15 percent of GDP. In Uzbekistan, agriculture accounts for more than 30 percent of country's employment (World Bank, 2013d). In the Kyrgyz Republic, agriculture employs 65 percent of the population, and in Tajikistan, 60 percent. In countries with a higher outflow of migrant workers (Tajikistan, Kyrgyz Republic, Uzbekistan), agriculture represents the main source of income for women. In addition, agriculture is instrumental to achieving food security in the sub-region and particularly in countries such as the Kyrgyz Republic and Tajikistan, the latter of which has consistently had the highest incidence of undernourishment in the sub-region (FAO, 2015b).

Agriculture is also the main consumer of water in the Aral Sea Basin and Central Asia depends on some of the largest irrigation schemes in the world, which were constructed during the Soviet era (Kazbekov and Qureshi, 2011). Soviet agriculture policies led to high land degradation, including salinization, which resulted in the reduction of agricultural land use (Bobojonov and Aw-Hassan, 2014). In particular, the well-documented Aral Sea catastrophe, in which the Aral Sea has been reduced to less than 10 percent of its original volume, is a vivid reminder of the effects of unsustainable agricultural practices on the area's fragile ecosystems (EC-IFAS, 2013). In the 1960s, the Soviet development of water-intensive cotton monoculture in Central Asia required diverting significant river flow from the Amu and Syr Darya - which fed the Aral Sea - to the cotton fields (UNDP, 2003; Schlüter, 1999). This disaster highlights the link between water and agriculture, and points to the need to coordinate water management in order to ensure the sustainability of the important agriculture sector.

In all Central Asian countries the agriculture sector went through significant reforms and restructuring following from the dissolution of the USSR. Those changes resulted in different outcomes in each country, yet the necessary structural reforms needed to improve resource use efficiency, streamline marketing, and address food security have not been fully implemented. Low water use efficiency, high irrigation losses due to high rate of evaporation, and high salinization levels characterize the agricultural sectors in almost all of these countries (Granit et al., 2010). In addition, productivity is further hampered by inadequate extension services available to small- to mid-scale farmers (Kazbekov and Qureshi, 2011).

Agricultural development is also linked with the land reforms in these countries, which all took steps to introduce various levels of privatization and market-oriented land distribution after gaining independence. The degree of success of these restructurings has varied across the sub-region; reform efforts struggle against systemic inefficiencies and remain incomplete in some areas (Dudwick et al 2005; Lerman and Sedik, 2008). This has particularly impacted the poorest countries in the sub-region - Kyrgyz Republic and Tajikistan - which are highly dependent on the agriculture sector. Levels of drought, water levels in hydropower stations, and higher food and fuel prices during economic crisis are factors that can contribute to food insecurity and increase vulnerability.

The agriculture sector is an important source of livelihoods.

Climate change is expected to have considerable effects on the agriculture sector in the sub-region. In particular, climate change will decrease long-term water runoff by accelerating glacial melt (Christmann et al., 2009). Currently, 'climate-smart' agriculture is being promoted as one of the ways to ensure the long-term viability of the sector. Relevant programmes include initiatives on land reforms (led by the World Bank, FAO, and USAID), climate change mitigation and

adaptation, land management and rural development (PPCR/Pilot Program on Climate Resilience in Tajikistan and Kyrgyz Republic, ELMRL/Environmental Land Management and Rural Livelihoods in Tajikistan), sub-regional programs such as the UNDP-led Central Asian Multi-Country Programme on Climate Risk Management, and the very new World Bank-managed Climate Adaptation and Mitigation Program for the Aral Sea Basin (CAMP4ASb). In 2015, the Kyrgyz Republic signed the FAO Country Programme Framework in the Kyrgyz Republic 2015-2017, which includes piloting climate-smart agriculture to explore further up-scaling (FAO, 2015a). Similarly, in 2016, FAO and Tajikistan signed the FAO Country Programming Framework for that country, which includes implementing the core concepts of climate-smart agriculture (FAO, 2016). These programmes aim to identify specific investment targets to enhance the sustainability of the agriculture sector. In the context of green economy development, such investments involve sourcing and applying advanced water and energy efficient farming technologies, promoting organic agriculture, ensuring sustainability of supply chains, and re-examining subsidies in the sector.

In the context of the 2030 Agenda, in addition to its obvious relevance to SDG 2 (ending hunger and increasing food security) increasing resilience to the effects of climate change on food security, agriculture, and other sectors, can also help CAM countries to achieve SDG 13, which focuses on taking urgent action to combat climate change and its impacts.

WASTE MANAGEMENT

Central Asia and Mongolia are affected by poor waste management practices. A legacy of Soviet nuclear tests, sizeable industrial waste and increasing urban populations make waste management a significant issue (Zoï Environment Network, 2013). Although waste management practices vary at the country level, the CAM countries share many common challenges, and sub-regional cooperation could help them to identify and implement solutions. SDG 6 and SDG 11, which aim to ensure the availability of water and sanitation for all and improve waste management, respectively, provide a set of targets and indicators that CAM countries can use to work towards improving waste management in the sub-region.

Most of the CAM countries generate large amounts of hazardous waste, primarily from mining and manufacturing, with Kazakhstan, the Kyrgyz Republic, and Uzbekistan being some of the world's top hazardous waste producers. (Zoï Environment Network, 2013). The legacies of radioactive waste and toxic agrochemicals also impact human health and the environment. Toxic waste sites are spread across the sub-region - such as the extensive uranium tailings of the Kyrgyz Republic's district of Mayli-Suu and Ust-Kamenogorsk's arsenic-laden industrial waste - and compliance with safety standards and environmental regulations needs to be improved. Consequently, such areas have a higher risk of transboundary water and soil contamination, which poses a threat to both humans and the environmental on a sub-regional scale. In the case of Mayli-Suu, the threat to neighbouring Uzbekistan is exacerbated by natural disasters, such as landslides, which increase the risk of cross-border contamination (Kunze et al, 2007).

Rapid urbanisation has made waste management an increasingly important issue.

Municipal and non-hazardous industrial waste management can also be improved. Waste storage, processing, and disposal have so far been done in an ad hoc approach in most of the CAM countries, and where countries have developed strategies and regulatory frameworks, in most cases they have not yet been effectively implemented. Large or rapidly growing cities and capitals tend to develop special municipal waste management plans - Almaty, Astana, Bishkek, Dushanbe, and Tashkent, for example - but

additional capacity building in waste management technologies and practices is still required (Zoï Environment Network, 2013). Central Asia generally lacks sanitary landfills, and the situation is particularly difficult in Uzbekistan, the Kyrgyz Republic, and Tajikistan, where more than 90 percent of operating waste disposal facilities and landfill sites are in need of maintenance and repair, with unprotected soil and decaying trash posing groundwater and air contamination threats (UCLG, 2013).

In order to support better waste management practices, it is important that national governments have appropriate legislation in place that incorporates the social and environmental costs of waste and emphasizes producers' responsibility to reduce, treat, and dispose of waste. An effective waste management framework integrates sustainable production and consumption principles and utilizes appropriate technologies to minimize the environmental footprint. This is the area where demand for technology transfer and private investment is one of the greatest, ranging from industrial waste in extractive and construction industries to municipal waste processing and wastewater treatment. By initiating national waste management strategies, introducing and/or strengthening regulations on waste processing and disposal practices, and promoting sub-regional cooperation and exchange in this area, the CAM governments can also encourage joint implementation of projects and programmes, pooling sub-regional resources to develop new or adopt existing advanced technological solutions.

UNDP has provided waste management support in the sub-region through its programs on electronic, pharmaceutical, and radioactive waste management in Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan. In Mongolia, donor support for waste management policies has come from the World Bank and the Japan International Cooperation Agency (JICA), who have helped to advance the national legislation and implementation of waste management policies (JICA, n.a.). Given the present economic circumstances in the CAM countries, public investment will likely need to be augmented by funding from the private sector and multilateral development banks, as well as by continued support from international organizations and donors. In Uzbekistan, for example, where municipal waste management has been improving, the government has provided tax incentives to private firms to invest in and build waste management facilities (Couzens, 2015).

The development of the waste management sector has the potential to create positive cross-cutting impacts. In addition to benefitting both human and environmental health by reducing the number of pollutants being released into the environment, the development and implementation of comprehensive waste management strategies can also have significant employment and economic benefits.

TRANSPORTATION CORRIDOR/ ROAD LINKS

Central Asia's strategic geographic position at the crossroads of Europe and Asia makes it a crucial bridge between cultures and economies. While its vast natural resources help connect the sub-region to its neighbours through sales of raw materials, CAM is gradually becoming a transportation route for trade moving from East Asia to the European Union and vice versa (Romanowski, 2015). Ambitious transportation infrastructure projects, such as some of those falling under the umbrella of China's B&R initiative, are likely to bring substantial investment and trade to the sub-region in coming years. Balancing the interests of different external stakeholders, such as China, the United States, the Russian Federation, Turkey, United Arab Emirates, Japan, and the Republic of Korea, who are involved in the sub-region's development, with those of the CAM countries themselves, as well as mitigating the environmental and social impact of investment and development projects, may present challenges in the near future. With a large number of international financial institutions involved in expanding transportation infrastructure in CAM, transportation represents an opportunity to incorporate the IGE approach to ensure that these new projects include meaningful social and environmental impact assessments, are pro-poor, energy-efficient and promote green trade.

Investments in transportation infrastructure have significant economic, environmental, and social implications for the sub-region as a whole, particularly along transportation corridors. New road and rail

connections will significantly increase the transit of people, goods, and services across the sub-region and beyond, and help countries to diversify their economies into new green sectors and facilitate the import of greener technologies and inputs from their neighbours. On the other hand, construction will often require the clearing of previously undeveloped land, which may impact ecosystems, forest cover, and agricultural land, and can lead to a variety of other environmental issues (e.g. soil contamination and air pollution) (Haiyan, 2015). If new transportation infrastructure development projects are to help CAM countries transition to IGE, they must address environmental and social concerns on two levels. The first involves minimizing the negative impacts from the construction of the projects themselves, and the second involves maximizing the positive impacts by designing the sub-regional development to promote greener growth in other sectors as well. So while new transportation infrastructure itself may not necessarily be green, its development and expansion can nonetheless present an important opportunity for IGE in the sub-region, if well planned.

Developing new or improved transportation infrastructure is key to opening up new IGE opportunities in the CAM sub-region.

By prioritizing inclusive transportation links and green infrastructure, the CAM countries can work towards achieving SDGs 9 and 11, which focus on expanding public, sustainable transportation that prioritizes the needs of the most vulnerable in sustainable cities, and by building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation.

Along with the extractive sector, the development of new transportation infrastructure, including construction of the so-called "Silk Road" transportation corridor, is likely to draw the most external investment in the CAM sub-region. The current lack of transportation infrastructure is seen as a bottleneck to wider regional economic integration, and China has already committed significant financial resources through the B&R initiative to the development of sub-regional infrastructure that will bring shared benefits (Zimmerman, 2015). In addition, a number of international financial institutions, including the ADB, World Bank, EBRD, and the new AIIB, are committed to investments in this field.

As one of the main international sources of funding in the sub-region, the ADB is particularly interested in supporting Central Asian countries to increase their transit potential and ensure their integration into the global transportation network (ADB, 2015a-e). In Kazakhstan, transportation constitutes more than half of the ADB portfolio – 53 percent or close to $1.8 billion – most of which is for the Central Asia Regional Economic Cooperation (CAREC)[13] Corridors Investment Programs. In Mongolia, under the same CAREC program, ADB supports new roads connecting Ulaanbaatar and China, as well as a part of the transportation fast link between Russia and China. These projects constitute close to 35 percent of the ADB portfolio in Mongolia, about $567 million. In the Kyrgyz Republic, it is 32 percent or $472 million for road rehabilitation between north and south of the country and improvement of services. In Tajikistan, it is 34 percent or $441 million. In Uzbekistan, 26 percent, or close to $1.18 billion, has been committed to upgrading domestic railways and extending rail links with Afghanistan (ADB, a-e). In addition, a new Dushanbe-Uzbekistan Border Road Improvement Project was approved with the co-financing from AIIB and EBRD in June 2016.[14]

The World Bank also plays an important role in the development of sub-regional transportation infrastructure, and has been responsible for conducting Environment Social Impact Assessments (ESIAs) for some of these projects (e.g. Almaty-Charges). In general, ESIAs have identified weak governance and lack of stakeholder engagement as common problems in these types of projects. The development of sub-regional standards for infrastructure projects could

help to address such issues. Public hearings are typically required by law at all key stages of ESIAs, yet their quality often does not meet international standards of practice (World Bank, 2012a). However, implementation of ESIAs in accordance with the World Bank's standards encourages advancement of public participatory approaches in these countries and will establish new benchmarks along the way. Analysis of ESIA outcomes for such projects should inform future steps towards ensuring that sub-regional infrastructure development brings socially inclusive and environmentally sustainable economic benefits. Therefore, activities targeting alignment of national regulations on ESIAs, public access to information, free prior informed consent (FPIC), public engagement, and consultations are key for ensuring inclusive and sustainable development.

CROSS-SECTOR ISSUES

It is important to recognize that the sub-regional issues identified above all have important cross-sector effects that must be considered. Water management provides an example of an issue that cuts across many sectors and requires a coordinated approach. Water from the Amu Darya and Syr Darya rivers are pivotal to both agriculture in Tajikistan and the Kyrgyz Republic and hydropower generation in the Kyrgyz Republic and Tajikistan, where 90% of Central Asia's hydropower potential is concentrated (UNECE, 2011). The need for water for different activities at different times of the year, such as farming in the summer in downstream countries and for energy in the winter in upstream countries, creates tensions between the countries (UNECE, 2011). However, changes that benefit one sector can also have positive impacts another. For example, improving the water use efficiency of irrigation systems could result in more water being available for use in for hydropower generation, as well as in improved agricultural output. Similarly, restructuring the agricultural crop mix can both change the timing and level of demand for water and improve farming incomes. Proper management of water resources also has important implications for human health and ecosystem management.

Analysis of the cross-sector impacts of potential policies can be complicated. Changes made in one

More efficient irrigation technology – such as the use of drip irrigation systems – can have positive impacts on multiple sectors of the economy.

sector are likely to have implications in multiple other sectors. Uzbekistan, for example, is particularly concerned about the impacts that water pollution from mining and waste disposal have on health and land degradation, and the effects of air pollution and GHG emissions from continued fossil fuel energy production (Zoï Environment Network, 2015). Most CAM countries are taking account of the relationships between water management, agriculture, and ecosystem protection through single-issue bilateral agreements that are negotiated along geographical lines. Valuable information generated by such approaches should be shared amongst stakeholder countries. However, more in-depth analysis and discussion of the relationships between sectors and their "downstream effects" is necessary to develop better IGE policies sub-regionally and to achieve the sustainable green development goals while avoiding or mitigating possible negative side effects.

Another important cross-cutting issue is financing. IGE investments need to be coordinated across sectors to ensure that full benefits are achieved. For example, countries may benefit from investing in improved irrigation technology before expanding the agriculture sector, and job training and capacity building is often required in order to benefit from green job creation. If the financial requirements are too large in the short term, some parts of the IGE transition may need to be delayed to better coordinate investments across sectors. Taking a longer-term view of the costs and benefits is essential in such analysis, and will help determine the most effective order of investments and show the time frame of the results they will generate.

Other studies have shown that the initial costs may be high and growth slow compared to business as usual, but once the green investments are fully functioning, growth would recover and outperform a business as usual scenario in the medium and long term (UNEP, 2011). This longer-term consideration of effects is important for designing the best IGE policies and programs, determining the best timing of different projects, and explaining what is happening to key decision makers.

The IGE methodology can be an important tool with which to understand these interlinked issues because at the heart of the IGE assessment is an analysis of the cross-sector impacts of potential policy interventions. One of the key steps of a Green Economy Policy Assessment (GEPA) involves the use of sophisticated simulation models that forecast the impacts of proposed policy interventions on different sectors and on overall well-being and social equity (UNEP, 2012). Such models have already been applied in Mongolia and China and revealed many useful aspects of these cross-sector relations that aided in the development of IGE policies in those countries (UNEP, 2014a). Analysis must incorporate social, economic and environmental indicators to provide a fuller picture of the issue and determine the long-term cross-cutting impacts of certain policies vis-à-vis "business-as-usual" scenarios.

Because each national context is unique, the initial IGE analyses should be conducted at the country level. However, as work goes forward on IGE, CAM countries would benefit from looking in more detail at the effects of their policy shifts on their neighbours, and on the sub-region as a whole. These cross-sector and cross-border relations are important to more fully understand the effects of the shifts to IGE and to identify where possible negative effects need to be mitigated. An example of such negative impacts may be those that shifts to renewable energy sources, such as hydropower, can have on ecosystems and land management in downstream areas. Furthermore, cross-sectoral analysis can help countries to understand how their IGE strategies and specific policies relate to the SDGs and other important aspects of the 2030 Agenda.

WORKING TOGETHER TOWARDS A SUB-REGIONAL IGE

The people of Central Asia have a centuries-long history of cooperation through trade and commerce along the ancient Silk Road, and in more recent times they have cooperated on issues such as security, transportation, energy, and the environment through the Shanghai Cooperation Organization (SCO) and the Interstate Commission on Sustainable Development (ICSD), among other forums. China's B&R initiative has also received support from CAM countries, and it has the potential to strengthen sub-regional cooperation and open up significant development opportunities for nearly 1.5 billion people. CAM countries have outlined programmes that indicate that green development is at the core of their long-term development strategies and that acknowledge the importance of strategic management and efficient use of natural resources. Building on existing efforts, sub-regional cooperation on IGE could further enhance the progress at a larger scale. Moreover, due to the transboundary and cross-sectoral nature of many of the sub-region's key sustainable development challenges, sub-regional cooperation may even be necessary in order for CAM countries to make the transition to IGE at the national level.

While full-scale cooperation on the development of a sub-regional IGE strategy will require increased and sustained efforts from the CAM countries, national-level IGE work can serve as a good starting point and may help to catalyse sub-regional cooperation on IGE.

At the national level, the development of an IGE strategy typically consists of the following steps:

1. Identification of priority sustainable development issues and sectors including related goals, targets, indicators, baselines and trends;

2. Analysis of the investments[15] required to achieve the selected goals and targets, including both public and private investment;

3. Identification of the policies that will enable and encourage the required investments. These include fiscal policy, trade policy, regulatory measures, social protection measures, and skills and human capacity development, among others;

4. Assessing the potential impacts of the proposed IGE policies on a wide range of indicators. This step usually involves the use of analytical tools to assess the outcomes of various scenarios.

By focusing on the development of national IGE strategies, countries can begin to develop a set of priority issues, from which common issue areas will emerge. This report has identified several key areas that can be used as the basis for the development of a sub-regional IGE strategy. However, countries should not wait for a sub-regional agreement before moving forward; beginning the process at the national level can help to stimulate cooperation at the sub-regional level.

During the IGE analysis, it is important that governments and policymakers make every effort to consider cross-border implications of potential policies, and try to take into account the sub-regional aspects of their national challenges. By cooperating where possible with their CAM partners, countries can help to ensure that national policies achieve effective sub-regional results which could pave the way for more formalized IGE cooperation.

The development of a sub-regional IGE strategy should follow the same general steps as a national IGE policy assessment.

To move forward with IGE at the sub-regional level, cooperation needs to be improved. The following steps include some measures that can be taken to help achieve this:

1. Enhancing policy dialogue on IGE within existing sub-regional cooperation bodies:

Some countries in this sub-region have already developed a national Green Economy/Green Growth

strategy, such as China's Ecological Civilization and Mongolia's and Kazakhstan's national Green Economy strategies. Sub-regional level IGE policy dialogues through existing channels would provide platforms for countries to exchange experiences, identify common priorities and policies needed, and develop a sub-regional IGE action plan, including a green investment strategy, to achieve IGE at the sub-regional level.

During the policymaking process and sub-regional dialogues, more attention should be given to the social and inclusive aspects of proposed policies. Countries should devote more attention to the impacts of their policies on the welfare of their populations, and in particular the effects of shifting conventional growth to green development. The negative effect of pollution on public health, for example, is an issue that is shared across the sub-region, and can be used as a starting point for a sub-regional dialogue. Policies to improve energy efficiency in transportation, buildings and production processes will also require some major changes in people's activities and lifestyle. For example, more use of public transportation or walking and choosing more energy efficient, and possibly smaller, homes. Cooperatively developing sub-regional green economy policies will help achieve more efficient shifts, more economic diversification, and more trade opportunities to help generate more scale efficiency in the creation of green jobs.

2. Capacity building, awareness raising, and knowledge sharing for policymakers, businesses, research institutes, and civil society:

IGE is a cross-cutting and emerging concept that requires a holistic understanding by decision makers in order to implement effective policies at the sub-regional, national, and local levels. Expertise is also needed in government agencies to better design, implement, track progress and evaluate the results of policies. The IGE process involves the use of quantitative assessment that requires specialized training. The development and promotion of regional knowledge-sharing platforms uniting experts, policy-makers, activists, and civil society can help to facilitate the capacity building and information exchange required for the shift to IGE.

3. Exploring the potential for CAM countries to use different financing mechanisms to implement IGE strategies:

Achieving national sustainable development goals and targets will require both public and private investments to access and improve technologies, reduce fossil fuel energy use and related pollution, increase renewable energy supplies, and improve infrastructure, including along the Silk Road Economic Belt. A green investment strategy could be the central building block of a sub-regional IGE strategy that could facilitate the mobilization and implementation of foreign, national, public and private financing for development. Sub-regional cooperation on these IGE policies would facilitate more effective financing and attract more financiers.

4. Assisting the development and exchange of green technology and natural resource management practices to create new opportunities for the sub-region:

The green technology sector has the potential to open up the international market for this sub-region and to catalyse new growth that would boost incomes and create jobs. Increasing the adoption and use of green technologies and practices - including wastewater, waste management and recycling, sustainable agriculture, mining, and energy production - would be a major factor in shifting to more sustainable development and improving living conditions in CAM. The promotion of green technology transfer and its incorporation into investment and development projects, for example, will open up new opportunities for IGE cooperation.

5. Formalizing sub-regional cooperation on IGE:

In view of the various ways that the CAM countries are interconnected through trade and transportation, resource use, information sharing, financing, and some intergovernmental processes, it is clear that further sub-regional cooperation on IGE issues in a coherent and integrated manner will increase the benefits. A formalized cooperation structure could provide the necessary framework for broad-based and coordinated sub-regional cooperation.

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NOTES

[1] UNEP defines a green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2010).

[2] For more information on SDGs please see https://sustainabledevelopment.un.org/sdgs

[3] For more information on the GEPA process, please see UNEP's http://www.unep.org/greeneconomy/Portals/88/documents/GEI Highlights/UNEP Assessment GE Policymaking_for web.pdf

[4] GBPP includes the Green Bridge Institute (Research framework and technology incubation) and the Green Bridge Facility (Technical assistance and investment support).

[5] These include: Albania, Belarus, Bulgaria, Finland, Georgia, Germany, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Mongolia, Montenegro, Russia, and Sweden.

[6] See http://greenkaz.org and for the G-Global communication platform see http://group-global.org/en

[7] For further details on IGE in Mongolia see PAGE (2014), http://www.un-page.org/files/public/final_mongolia_stocktaking_report.pdf

[8] Mongolia has used green economy modelling tools that integrate economic, social, and environmental factors into a coherent framework that can generate predicted scenarios of up to 30 years to illustrate the likely effects of different green economy policies versus "business-as-usual" approaches.

[9] These energy goals and investment information were presented by the senior specialist of the Environmental Protection Committee.

[10] ENVSEC is a partnership of six international organizations (UNEP, UNDP, UNECE, OSCE, REC and NATO as an associated partner) and its activities include policy integration, risk mitigation and civil society strengthening (Gaia Consulting, 2010).

[11] For example, between Tajikistan and Uzbekistan, Kazakhstan and Kyrgyz Republic, Kazakhstan and China.

[12] The largest of these are the Kambarata project in the Kyrgyz Republic and the Rogun and Sangtuda projects in Tajikistan

[13] CAREC was established in 2001 comprising 10 countries: Afghanistan, Azerbaijan, PRC (primarily Xinjiang and Inner Mongolia), Kazakhstan, Kyrgyz Republic, Republic of Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. There are four areas of cooperation: transport, energy, trade policy and facilitation.

[14] For more information, please visit: http://euweb.aiib.org/html/2016/NEWS_0624/120.html, and http://euweb.aiib.org/html/2016/PROJECTS_0706/106.html

[15] The concept of investment is used broadly to mean any public or private spending aimed at creating and maintaining an asset – built, natural, human and institutional. Investment includes capital costs as well as Operation and Management (O/M) costs. There may also be costs in providing training of workers and setting up new institutions. In addition, there are indirect investment requirements, such as the need to improve infrastructure, so that sector-specific investments can be properly implemented and utilized.

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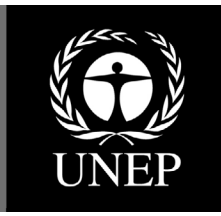

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