Environmental security debates in Central Asia: The post-Kiev process

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Preliminary version

Please do not cite

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1. Introduction

Environmental risks and mismanagement of the environment can develop to serious sources of conflict within and between states. These conflicts are generally not the result of environmental problems as such but of the incapability or unwillingness of governments to find solutions to these problems or efficiently implement inter-state agreements on management of the environment. Environmental risks are primarily the result of resource-intensive, sometimes resource-wasting patterns of production and consumption, and of inadequate agricultural practices.

Often they are the product of but also enforce larger socio-economic problems such as population growth, poverty, forced migration, refugee movements, political instability, ethnic tensions, and border disputes.

Environmental and socio-economic problems combined can put national and international security at substantial risk.

The region under study, Central Asia (CA)[1] is subject to a number of serious environmental problems among which the desiccation of the Aral Sea, as result of the cotton monoculture, the pollution of the Caspian Sea, the pollution of drinking water, salination of the soil, soil erosion etc. and the consequences of nuclear weapons testing at Azgyr, Lira, Aral, Say-Utes, and Semipalatinsk-Kurchatov in Kazakhstan.

These environmental problems were already serious political issues during the Soviet Union period and are now crucial for political and economic development and stability. For example, safeguarding the access to water already has let to some border disputes between the five countries. The CA economy to a great extent depends on agricultural production. The salination of the soil undermines this important source of income.

In this article our aim is to identify the main environmental risks in CA and their interrelation with potential or existing areas of conflict in the region. We first give an overview of the social, political and economic developments in CA since the disintegration of the Soviet Union. In the following we identify environmental risks in CA and finally we discuss national, regional and transnational policy measures taken against these risks.

The paper ends with the proposition that only regional co-operation will be able to deal with environmental risks in CA.

2. State and society relations in post-Soviet Central Asia

Since the end of the Cold War there has been a transition to the so-called market economy democracy in a number of Eastern European countries. While the process of democratisation has swept across many nations it has not yet reached CA countries. For the first time in history legally *formal* independent nation-states have been set-up in CA. Despite expectations by many that their independence could automatically lead to democratisation, what has actually emerged in all five states of the region are regimes of authoritarian presidentialism. The rise of such strong centralised authoritarian regimes was caused by both a fragmented and weak society, and related social forces on the one hand, and backward economic structures, compared to most of the former socialist countries of Eastern Europe, on the other.[2]

The CA states have had to cope with the complexities of rapid economic and social transition as well as the establishment of a new political order. The way in which they respond to these challenges is similar due to their common experience of more than 70 years of Soviet rule.

CA countries not only have had to deal with problems concerned with dismantling the Soviet power structure and introduction of a social-economic development programme. Problems also involve the struggle for survival of various social forces. The post-Soviet top priority on the political agenda of these states has been the prevention of ethnic and social conflicts rather than the introduction of Western-style democratic procedures or the management of environmental risks. This has several reasons:

- ♣ National revival replete with the construction of nation-state [political system] and the preservation of the societies' multiethnic character;

- ♣ Dismantling the Soviet power structure while having to deal with social upheavals and rising radical Islamic forces;

- ♣ Conflicts between modernising urban-orientated areas and traditional rural-orientated areas;

- ♣ The aim to distance themselves from Russia. Although they are trying to decrease their reliance, CA is still dependent on Russian support for economic development and military assistance to guarantee a stable security environment in the region;

- ♣ Dependence of the local élite on Russia with little backing from their own populations; and

- ♣ Weak legal structures that prevent the needed large scale Foreign Direct Investment (FDI) especially in the energy sector as well as the implementation of agreements of management of environmental risks.

CA is a multiethnic region which through the course of history has been influenced by different ethnic groups. The incorporation of CA into the Soviet Union also had a great impact on the demographic composition of the region. By 1911, after the Tsarist conquest 1,544,000 Russian peasant settlers had migrated to the Kazakh steppe. Through Stalin's deportation of the 'politically unreliable' and resettlement policies, Volga Germans, Crimean Tartars, Chechens, Koreans, and other Asian and European nationalities were sent to CA. Under Khrushchev, more Russians, Ukrainians, Belarussians, and Latvians settled in the region. By 1959, the number of Russians and Ukrainians alone that lived in CA was estimated at 7.3 million. Although many Russians left CA after the break-up of the USSR, those who have stayed will play a significant role in its future, representing Russia's economic interests and interests of domination, and occupying key positions in the industries of CA.[3]
The average Russian population in CA in 1999 was still 8.9 percent, in Kazakhstan alone it was 30 percent. The average population of other ethnic minorities was almost 25 percent in 1999. Since the collapse of the Soviet Union the region's Muslim population has significantly increased.

Kazakhstan is the largest of the CA countries, spanning an area of 2.7 million km^2 but with a population of less than 15 million. About half of the population is ethnically Kazakh. In the north of the country lives a strong Russian minority. Other ethnic minorities include among others Ukrainians, Uzbeks, and Germans. Kazakhstan is rich in oil and gas and mineral resources. It comprises a large diversity in landscapes and ecosystems. Kazakhstan's geographic destiny is primarily shaped by the two neighbouring great powers China and Russia as well as the Caspian Sea. ***Kyrgyzstan*** is mountainous and inaccessible. It covers an area of 198,500 km^2. The majority of its population lives in the peripheral areas of the country. Kyrgyzstan has a complex ethnic composition, among which apart from ethnic Kyrgyz, Uzbeks, Russians, and others. Kyrgyzstan has only limited natural resources. The country shares borders with China, Kazakhstan, Tajikistan, and Uzbekistan. ***Tajikistan*** has recently partially emerged from an ongoing civil war during 1992-97. It is a mountainous area of which more than 50 percent lie at a height of at least 3000m. Tajikistan has a population of 6.2 million people of which about 64 percent are Tajik and a large Uzbek minority of 25 percent. The country borders Afghanistan,

China, Kyrgyzstan, and Uzbekistan. ***Turkmenistan*** covers an area of 488,100 km^2. The country has large reservoirs of gas and substantial oil reserves. In Turkmenistan lies the Kara-Kum desert, one of the biggest sand deserts in the world. The country has the smallest and ethnically most homogenous population of the CA republics. Turkmenistan has borders with Afghanistan, Iran, Kazakhstan, and Uzbekistan.
Uzbekistan, has the highest population density in the region. The majority of the population is Uzbek. But, the country has also substantial ethnic minorities such as Russians, Tajiks, and Kazakhs. Uzbekistan holds a variety of resources including natural gas and oil, gold, and silver. Both the Aral Sea and the Ferghana Valley—two of the main areas of conflict in CA—lie in Uzbekistan posing a threat to security in the region.[4]

Central Asian political regimes since Independence

All state leaders in CA introduced authoritarian rule to their countries after independence in 1991. They were convinced that stability was more important than reform and saw these policies as justified by events.
The presidents of ***Kazakhstan, Uzbekistan,*** and ***Turkmenistan***– Nursultan Nazarbayev, Islam Karimov, and Separmurat Niyazov respectively – are all former First Secretaries of their republics' Communist Parties. President Askar Akayev of ***Kyrgyzstan*** was a physician, dissident, and head of the country's Academy of Science before being elected without a consolidated political élite behind him. Not surprisingly, after a period of democratisation rhetoric, Akayev was forced to create the same political model as other CA states. Similarly, ***Tajikistan's*** Imamali Rahmanov did not have a real constituency and did not embody reform credentials.
All presidents of CA have become known for running tight ships. They wield the most authoritarian rule, along with Belarus and the South Caucasian countries (Armenia, Azerbaijan, and Georgia), in the post-Soviet space. In all CA states opposition groups and parties are repressed and elections are manipulated. Contemporary political life in CA is characterised by a deeply rooted apathy on the part of the majority of the population. This is partly due to the enforced politicisation of the Soviet era as well as disillusion with the Communist Party following the collapse of the Soviet Union, engendering cynicism and distrust of all forms of political activity. Additionally, most people are occupied with problems of everyday life leaving them little energy for political issues. Political parties tend to be centred around individuals either with strong personalities or enough money to establish a power base. Party membership is usually very small and based on personal networks.[5]

The Economy in Central Asia

Since independence from Russia in 1991, the CA countries have been exposed to the decisive impact of several powerful processes: nation-state building, the formation of national economies, and the transition from a planned to a market economy. The transition over the past twelve years to a market economy and democracy in the countries of post-Soviet CA, has provided some grounds for optimism but in many ways has also been a social and moral disaster. The problems of transition attract particular attention because of the region's huge energy resources. Transnational Oil Corporations (TNOCs) already have made large-scale investments in energy projects. Competing export pipeline projects create tensions between the various actors interested in the region. Whether it will be possible to attract FDI to the region to exploit fully its economic potential will largely depend on the political stability within these countries, which yet again will be determined by their respective internal developments. Where growth is measured, it is not necessarily a reliable indicator of economic or social health, as it is based on sharp rises in inequality and an explosive growth of intense misery and poverty. In many countries the experience of the last twelve years has been dispiriting.

Although people have gained greater political freedom, they have paid a heavy price in other ways. The rapid rise in unemployment and the fall in real value of wages and pensions has plunged millions of people into poverty. Today there is a much wider gap in incomes between rich and poor than under Soviet rule.[6]

When the CA countries became independent their economies depended to a great extent on trade which was largely directed to the other USSR republics. This dependence, although the trading partners have become more varied, has persisted during the first decade of transition. In 2001 Kazakhstan, Turkmenistan and Uzbekistan had a trade-to-GDP ratio[7] close to that of 1990. In Kazakhstan it was 39 percent (43 percent in 1990), Turkmenistan 35 percent (44 percent in 1990), and Uzbekistan 43 percent (44 percent in 1990). For Kyrgyzstan and Tajikistan a sharp change in the trade-to-GDP ratio could be noted. In Kyrgyzstan it fell from 50 percent in 1990, to 34 percent in 2001, mainly due to the fact that Russia no longer bought manufactured goods from Kyrgyzstan. In Tajikistan the trade-to-GDP ratio already as high as 47 percent in 1990, had risen to 67 percent by 2001. The civil war in Tajikistan had hampered a reconstruction of the non-farm sectors. In general, all CA countries were more dependent on trade on the eve of independence than, for example, current Turkey (21 percent) and Iran (six percent).

This implies that the economic recession of all former Soviet trading partners during the 1990s had a direct effect on the CA economies.[8] Therefore, CA countries from the mid-1990s attempted to find trading partners outside the CIS. Between 1995 and 2001, Kazakhstan increased its non-CIS exports from 45 percent to 70 percent, Kyrgyzstan from 34 percent to 64 percent, Turkmenistan from 51 percent to 71 percent, Uzbekistan from 61 percent to 75 percent, and in Tajikistan it remained at 66 percent for this time period, mainly due to aluminium exports from the giant Tursanzade plant.[9]

The growth in exports has been concentrated mainly in raw materials, a tendency fraught with negative consequences. Volume of production increases in those branches intensify imbalances in the economy. As noted, during the Soviet period CA countries, especially Uzbekistan and Tajikistan, depended on cotton production introduced to these republics by the Soviets. Kazakhstan has a well-developed agricultural and industrial sector. Since the end of World War II, Moscow has invested substantially more to develop the Kazakhstan economy than for any other CA country. However, like other CA countries, Kazakhstan suffers great economic decline and instability. The natural oil and gas resources, especially in Kazakhstan, and Turkmenistan could be a tremendous source of economic development. This is hampered, however, by fluctuating oil prices and the fact that new pipeline outlets will have to be constructed to reach the maximum in oil and gas exports. Imports from non-CIS countries increased substantially in all CA countries except for Tajikistan. Tajikistan decreased non-CIS imports between 1995 and 2001 from 41 percent to 22 percent. In Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan imports from non-CIS countries between 1995 and 2001 rose from 30 percent to 48 percent, 32 percent to 46 percent, 45 percent to 63 percent, and 59 percent to 72 percent respectively.[10]

Consumer product and producer good imports play a major role in satisfying domestic demand. Consequently, to satisfy everyday needs CA countries have become almost entirely dependent on imports. The expansion of production will be decisive for economic growth. But, production relies on old capacities, which implies that domestically produced products cannot compete with imported goods. Privatisation and FDI are the key policies that could provide positive impetus to domestic production.

A major step towards restructuring the CA economies is the privatisation of state-owned companies. This usually has taken place within the context of a step-by-step program, with the initial phase beginning with small-scale enterprises in the early 1990s. Despite privatisation,

businesses – now in private hands – still do not operate as expected. There are several reasons for this: lack of basic technical and professional skills, corruption and organised crime, lack of investment and new markets, little change in business strategy.[11]
Particular factors with a negative influence on CA economies include the acute shortage of resources for savings and capital formation, inaccessibility of credit for investment in the productive branches of the economy, low level of investment activity, and the backwardness of the stock market.[12]
In Kazakhstan and Turkmenistan the bulk of FDI went into hydrocarbon development and also into metals in Kazakhstan. Since independence Kazakhstan has had the highest inflow of FDI amounting to US$11 billion or US$741 per capita compared to US$1 billion or US$189 per capita in Turkmenistan. In Kazakhstan, of the money invested in 2000, 62 percent went into the raw-material branches and only eight percent was invested in manufacturing. Of the bank credits for the same year 60 percent of the total was used as working capital and 40 percent for investment in fixed capital. FDI per capita in the other countries is rather modest. Tajikistan, because of political insecurity and lack of viable projects for investment, stands at the bottom of the list of the 27 transitional countries for which EBRD maintains statistics. In Tajikistan FDI per capita accounted for US$25 for the period 1989-2001, in Uzbekistan it amounted to US$30. Kyrgyzstan is open to offers but its cumulative US$101 per capita is only half of the CIS average of US$196, and far below those eight transitional countries that are expected to be admitted to the EU in 2004 (US$1,370 per capita).[13]
It is interesting to note that despite economic decline, social development in CA countries is better than in other countries of the developing world. The UNDP Human Development Index (HDI) lists indicators of human capital such as life expectancy, adult literacy, education, and economic provision. According to Kaser: “the values which it shows for Central Asia and the Caucasus reflect the apposition of a substantial inherited stock of human capital with a meagre flow of current income.”[14] The divergent effects of these two sets of indicators could be illustrated by comparing, e.g. Kazakhstan with another oil exporting country outside the region Saudi Arabia. For example, the HDI for the year 2000 shows that Saudi Arabia and Kazakhstan are ranked equally at 0.75.[15] The scale runs from Norway’s 0.95 down to Sierra Leone’s 0.28. In terms of economic indicators, however, the Saudi GDP per capita in 2000 at an exchange rate of PPP[16] was double than that of Kazakhstan. In 2000 the per capita value in Kazakhstan was US$5,871, below that of 1989 at US$8,127. For Saudi Arabia it was US$11,367 in 2000 compared to US$19,525 in 1980, thus documenting severe declines in both countries in terms of measured GDP. The overall social development under President Nazarbayev, however, is better than under Saudi Arabia’s King Fahd. In terms of income inequality, measured by the Gini coefficient (0 represents perfect equality and 100 all income going to one person) Kazakhstan with 35.4 is almost the same level as the UK with 36.8. There are no available statistics for Saudi Arabia. Thus, Kazakhstan like the other CA countries, in terms of socio-economic development, can be considered as at a *medium* level of human development. In 2000 Turkmenistan had a HDI score of 0.74, Uzbekistan stands at 0.73, Kyrgyzstan at 0.71 and Tajikistan at 0.67.[17]
CA countries suffer from a lack of skilled workers, particularly because of Russian emigration from the region and high unemployment rates. Official unemployment rates for the five CA countries are: Kazakhstan 6.3 percent (1999), Kyrgyzstan 5.4 percent (1998), Tajikistan 2.8 percent (1999), Uzbekistan 0.6 percent (1999). There is no current information available for Turkmenistan.[18] Unofficial rates are expected to be much higher. Privatisation of most institutions in the social sphere has lead to increases in the costs for heath services and education, both of which have become impossible to pay for a large part of the population. Diversification of production away from the extraction of natural resources would improve the prospects for macroeconomic stability and environmental conditions. All CA countries still have

to align their economic institutions and practices with those of developed market economies. Both national and international agencies will need to cooperate to bring about a significant improvement in the economic environment of CA countries. This will not be possible in the short run and considering the authoritarian character of the countries' political systems, it might not be in the foremost interest of the political élite of these countries. Of even less interest to the local political élite is to deal with environmental risks in CA, which if not managend in an efficient way will even enforce the economic problems.

3. Environmental risks in post-Soviet Central Asia

The harsh climate conditions in CA in the past impacted specific patterns of human settlement and activities. A great part of the land—home to fragile and unique ecosystems (e.g. taiga, tundra, steppes)—could not sustain considerable human population and remained in their natural state well into the 20th century and some parts even until now. In other areas, such as dry grasslands or tundra, only nomadic pastoral agriculture was possible and no stable human settlement took place. Until the early 20th century most of the agricultural land was either in large estates or in village communal property.[19] Despite its aridity CA has a long history of agriculture and settlements and some of the oldest known sites of irrigation in the world.[20] Water was seen as a 'Gift from God' that could not be owned or controlled by an individual.[21] After the Bolshevik Revolution in 1917 and the subsequent emergence of the Soviet Union water and land was taken "out of the hands of traditional elders and councils with whom it resided"[22]. What was established instead were a number of government bodies who were responsible for water management. Like Tsarist Russia the Soviets were convinced that CA could develop to a major cotton producer if the irrigation system was developed. In 1918, the Council of People's Commissars allocated 50 million roubles for the development of an additional 550,000 hectares (ha) of irrigated land. By the 1920s when all CA had come under Soviet rule it had developed into a major exporter of cotton crops and foodstuff for the Soviet Union. Cotton supply had risen to 50 percent. More than a half of total income from agricultural production in CA (not counting the khanates[23] Bukhara, Khiva, Kokand) came from cotton. During the Soviet period an additional 4.9 million hectares of new land were opened for production. The total area of land under irrigation then amounted to 7.5 million ha. New canals and irrigation projects were constructed as well, the most notable being the great Ferghana Canal, completed in 1939.

In contrast, industrialisation in CA was not very extensive. Poor quality coal was mined as well as some copper and iron. Until the beginning of the 20th century main economic activities in CA remained the processing of cotton, leather tanning, wool washing, and silk spinning.[24] Between 1928 and the outbreak of World War II industrial development was accelerated. The economies of each Soviet republic were interdependent, as the Soviet Union's economy had been functioning as one giant plant.[25] In Tashkent a large textile plant was built. An agricultural machinery plant, fertiliser plants and mechanised cotton gins only served the cotton industry. In 1946 at Bekabad in Uzbekistan a small steel plant was put into operation. In the 1950s large deposits of natural gas were found at Gazli near Bukhara, at Jarkak and Murabek in Uzbekistan, most of which was transported to the Urals. Metallic minerals, including copper and molybdenum, were mined at Almaliq; lead at Chimkent; lead, zinc, mercury, and antimony in Tajikistan; uranium was found in the Ferghana Valley and Kyrgyzstan. Central Turkmenistan provided the chemical industry with sulphur, and the shores of the Kara Bogaz Kol on the Caspian Sea with sodium sulphate. From Kazakhstan came phosphorite for chemical fertiliser. In support of industrialisation, thermal and hydroelectric power stations were also constructed. At Dushanbe in Tajikistan a large chemical plant used local sodium chloride and power from the Nurek Dam also supplying power to an aluminium plant using aluminium from the Urals.[26]

While Moscow benefited economically from the distorted and destructive development of CA, the region and its inhabitants had to pay for its costs: environmental degradation; water shortages and pollution; unskilled menial labour; health problems including high rates of infant mortality, respiratory illnesses, typhoid etc. without receiving any significant material benefits.[27] The post-Soviet CA states have now to face the legacy of the policies. Environmental problems in post-Soviet CA pose a serious risk to human and regional security.

The most urgent environmental risks to human security in post-Soviet ***Kazakhstan*** are issues related to water, radiation and waste. Kazakhstan borders the Aral Sea (together with Uzbekistan) - once the world's fourth largest brackish inland water reservoir and now one of its most devastating environmental problems with an almost collapsed ecosystem. During the period of Soviet rule great amounts of water were diverted from the rivers Amu Darya and Syr Darya[28] for the expansion of cotton production in CA. This system of irrigation had a great impact on the water balance of the Aral Sea.
In only 30 years (1960-1990) the surface of the Aral Sea shrank to a half of its original size from 66,900 km2 to 36,500 km2. Its volume shrank by two thirds from 1,090 to 310 km3. By 2010 it is expected that the Aral Sea's size will have declined to 21,058 km2 and its volume to 124 km3.[29]
This has also a great impact on the region around the Aral Sea. As Spoor and Krutov note: "The drying out of the Aral Sea is having far reaching consequences for the climate and biodiversity of the surrounding regions, while desert winds are transporting sand and salt over long distances, depositing millions of tons of (often polluted) salts on agricultural land all over the basin area. Due to inadequate and badly maintained drainage systems, water logging is widespread and soil salinity is an increasing environmental problem. The worsening ecology of the region makes living in many areas-such as Karakalpakstan in Uzbekistan and Kyzlorda in Kazakhstan, where poverty and environmental degradation are linked in a vicious downward spiral-quite inhospitable."[30]
For example, the economy of the area of Karakalpakstan used to depend on fishery in the Aral Sea. The withdrawal of water for irrigation led to a rapid increase in salinity of the Aral Sea to which many of the native fish could not adapt. By the 1980s commercial fishing came almost to a halt. In 1959 the fishermen fished 50,000 metric tonnes of fish (mainly carp, bream, pike-perch a. o.). In 1994 those few fishermen that still fished there retrieved 5000 metric tons of carp.[31]
The deterioration of the Caspian Sea to which Kazakhstan is adjacent beside Azerbaijan, Iran, Russia and Turkmenistan is another environmental risk to human security in Kazakhstan and the other littoral states.
The Caspian Sea is the largest inland sea in the world and produces almost all black caviar in the world. About 10 million people inhabit the area around the Caspian Sea most of whom living from the Sea especially fishing.[32] Additionally the Caspian Sea owns a great amount of the world's oil and gas resources. The Energy Information Administration estimates the Caspian Sea's proven oil reserves to be between 17 and 33 billion barrels (3 percent of the world's total). Proven natural gas reserves are estimated at 232 trillion cubic feet (tcf) (4 percent of the world's total).[33]
The existing and planned exploitation of the Caspian hydrocarbon resources—heavily promoted by Transnational Oil Corporations— is a direct as well as indirect source of environmental problems in CA and the Caspian region. Environmental risks include: fluctuations in the sea level, surge effects, the increasing salinity of groundwater, industrial pollution, loss of biodiversity and other factors.
Trans-border environmental problems could develop to trans-border conflicts. The unresolved question around the legal status of the Caspian Sea, how to regulate the exploitation of the

Sea's resources and the geopolitical interests of the five littoral states could even worsen conflicts.[34] At the same time the littoral states' interests to profit the most from their hydrocarbon resources have led to a neglect of environmental issues making it difficult to formulate a co-ordinated regional policy on environmental security and management of the Sea's resources. Such a policy would be necessary to improve the environmental situation in the Caspian region.[35]
Other environmental risks of concern in Kazakhstan are water supply for agriculture and industry and drinking water quality standards. Because of the deterioration of the Aral Sea and the Caspian Sea Kazakhstan and also Uzbekistan have a great dependence on river-systems for its water supply particularly from the Syr Darya. [36] The relations between Kazakhstan and Uzbekistan are tense both because of land and water disputes.[37]
Another major environmental risk in Kazakhstan are the consequences of its high levels of radioactivity in the Semipalatinsk and other regions as result of nuclear testing during the Soviet period where natural radioactivity is two to three times higher than the global average posing long-term health risks.[38]
An additional environmental risk to human security are large amounts of industrial waste and inappropriate waste management in Kazakhstan. Major industries are located in the eastern part of Kazakhstan. Improper waste disposal and the great amount of hazardous wastes pose a risk to the contamination of surface and groundwater by heavy metals.[39]

The most significant environmental problems in ***Kyrgyzstan*** are related to irrigation for agriculture, and large-scale gold and uranium mining.
Kyrgyzstan is CAs main supplier of water for irrigation. While having a great amount of water it has a scarcity of coal, oil, and gas resources. In exchange for providing the other CA countries with water Kyrgyzstan receives natural gas, coal, and oil from its two neighbours, Kazakhstan and Uzbekistan. There are even official agreements that oblige Uzbekistan and Kazakhstan to supply *Kyrgyzstan* with heating resources in exchange for water supplies.[40]
In the mountainous region of Kyrgyzstan rises the Syr Darya river-one of the two main rivers of the CA region. It then flows through Uzbekistan and Kazakhstan to finally empty in the Aral Sea. The Syr Darya supplies water to the massive irrigation systems on which the agricultural economies of CA depend.
The Soviet constructed the Toktogul dam to ensure sufficient water for irrigation in Kazakhstan and Uzbekistan in the summers and the Chardara dam to control spring floods.
During the Soviet period the CA states were integrated in one country and the water management infrastructure was constructed were it made the most sense geologically. Now this integrated system is divided between different states each of which has different needs from it.
For example, Uzbekistan and Kazakhstan have huge cotton fields, which are a significant source of foreign exchange earnings and are dependent on water supply from Kyrgyzstan. Since the disintegration of the Soviet Union Kazakhstan and Uzbekistan charge Kyrgyzstan for supplying gas and oil and Kyrgyzstan runs the Toktogul dam for power generation in the winter to satisfy its energy shortages because Kazachstan and Uzbekistan do not fulfil the delivery of heating resources according to the agreement mentioned above. This has caused great downstream flooding, overflowing river banks, and washing away many villages, including inhabitants and their livestock. As a result Kazakhstan started to contain the water behind the Chardana dam. When the capacity if its reservoir was exceeded the water broke through into the Arnasai depression in Uzbekistan. This depression filled up creating lakes of the former lowland marshes Aidar and Tuzkon. Now, every year these lakes fill up with water flooding the surrounding countryside, village, pasturelands, and infrastructure (power and communication lines, roads, and gas pipelines). In Uzbekistan the costs of flooding in 2001 were estimated at

US$3.8 million.[41] In the beginning of 2004 the Chardara dam almost broke due to extremely high water flows from Kyrgyzstan which shows the risks following of bad implementation of regional agreements.[42]
Other key environmental risks are the mining of uranium, heavy metals and mercury, as well as the storage of past mining wastes. Environmental pollution by these dumps could cause serious human health risks, e.g. by contaminating drinking water and arable soil. Other environmental pressures result from soil contamination through agricultural practices, such as intensive cattle grazing, as well as illegal logging for wood fuel causing deforestation. Deforestation could result in constraints of water supply and food availability, posing significant threats to human security on the southern and northern parts of the Ferghana Valley and being a potential source of conflict among the different population groups.[43]

In ***Tajikistan*** the main environmental risks are the impact of natural disasters, increasing land erosion and salination, and limited availability of clean drinking water.
The country is subject to earthquakes, landslides, mudslides and floods. Often these natural disasters are worsened by human activities such as the use of the mountainous areas and lowland plains for cattle grazing, deforestation, small-scale agriculture, mining and road building.[44]
These natural disasters killed 200 people and were responsible for an estimated damage of several million US$ in the latter half of the 1990s. They affect Tajikistan every year.
According to the Tajik Pedagogical Institute 38 percent of the country's soils are eroded. Members of the Academy of Sciences even believe that erosion affects up to 60 percent of Tajikistan's total territory. The mountains covering 93 percent of the country are young and dynamic accounting to a great extent for a high degree of natural erosion. Because of these characteristics the mountains are very fragile to human activities mentioned above.
Salination has become a widespread problem. It is the result of natural conditions and improper irrigation and drainage practices. In Tajikistan only 7 percent of the territory is arable but agriculture still plays a significant role for the economy.
Every year 4,000-5,000 ha are taken out of use for agriculture because of salination and waterlogging. Contamination of land is also the result of uranium mining waste and high radiation levels in some areas.[45]
Although water quantity is not a major problem in Tajikistan and the quality of water is generally high the drinking water standards are not always met. This is mainly due to poorly operating wastewater treatment facilities. These environmental risks have great effects on human health with a spread of typhoid, and an increase of the morbidity of people.[46]
Like Kyrgyzstan Tajikistan has only limited oil, gas and coal resources and relies on its neighbouring countries for the provision of these resources. Therefore, also like Kyrgyzstan, it aims to develop its hydropower potential and is confronted with the problem that sufficient water has to be ensured for irrigation in the downstream areas of Uzbekistan and Kazakhstan in the spring and summer. In recent years access to contested water supplies had led to tensions and violence between Kyrgyz and Tajik villagers on the borders between the two countries.[47]

Environmental degradation in ***Turkmenistan*** is largely the result of soil erosion and salinization, use of rivers for irrigation and human activities, water and soil pollution by pesticides and the building of dams. It causes desertification of oases and mountain landscapes as well as dropping groundwater levels and water loses in the Kara-Kum canal due to bad infrastructure, and increasing water use for the urban population and for industrial use.[48]
In Turkmenistan 80 percent of the land are desert. Intensive cotton farming in the last decades have drained freshwater reserves and caused the salinization of the Amu Darya River. The

Amu Darya river provided drinking water for Dashoguz Province. According to Arslan Berdiyev, project officer of the United Nations children's fund (UNICEF) in Ashgabat only about 20 percent of the population living in the Dashoguz Province (1.2 million people in total) have access to clean drinking water. To drink salinated water could cause kidney problems. It is estimated that about 40 percent of the people living in the region of the Aral Sea have kidney problems.[49]
Water scarcity has an immediate influence on human living conditions and on agricultural productivity.
Also Turkmenistan's agriculture depends on the Amu Darya River. The river water used for agricultural irrigation reduces the quantity and quality of food production posing a great risk to the health of the population.[50]
Cotton production has a great economic importance for Turkmenistan. Although gas is the main export product the amount that cotton exports contribute to the state budget has continued to rise since 1991.[51]
Because of its great reliance on agriculture irrigation is a main security issue for Turkmenistan.[52]
Turkmenistan and Uzbekistan have experienced tensions in regard with water allocation from the Amu Darya.
For example, the the Dashhowuz province (Turkmenistan), Khorazm province (Uzbekistan), and the Autonomous Republic of Karakalpakstan (Uzbekistan) depend for water supply on the lower Amu Darya. Here, tensions arose when Turkmenstan after independence in 1991 built a canal away from the Tuyamuyun Reservoir to improve water delivery for the oasis in the lower reaches of the Amu Darya and also to improve its control over the water supply within Turkmenistan.[53] But, the Tuyamuyun Reservoir that had been built during the Soviet period to increase Uzbekistan's storage capacity was under Uzbekistan's jurisdiction.

Uzbekistan's main environmental risks are water and agriculture.
All but one province in Uzbekistan depend for 71 to 100 percent on external water supply.[54]
The agricultural heritage of the monoculture of cotton production makes land deterioration and contamination Uzbekistan's second largest problem for human security. The deterioration of the Aral Sea (already described above) leads to severe health problems, and the lack of employment to migration from the Aral Sea to other regions in the country which now have to cope with an immense increase in population density.[55]
In Uzbekistan the relation between ethnicity and territory is the most accentuated and the most fragile to conflict in CA. Uzbekistan has only little control of its water supply and has large a Tajik population that dominates its water supply. Two out of four areas with the highest water vulnerability in Uzbekistan are located in the Ferghana Valley.[56]
Particularly in the Ferghana Valley the interrelation between resource issues, ethnicity, economic development, and state formation in the post-Soviet context becomes obvious.
The fertile Ferghana Valley covers only 5 percent of the territory in post-Soviet CA but inhabits 20 percent of the region's population, including large minorities of ethnic Kyrgyz, Tajiks, and Russians. It is split between three countries: Uzbekistan, Kyrgyzstan and Tajikistan. The Ferghana Valley produces a major share of the country's cotton and grain crops and contains numerous manufacturing plants, as well as natural gas and oil fields.[57] When the Soviet Union disintegrated the territorial borders in CA that had only been created during the Soviet period gained in significance and became particularly sensitive between the three countries that share the Ferghana Valley.[58] The Ferghana Valley-which also is one of the poorest areas in CA with high unemployment rates- is also a breeding ground for radical Islamist groups the tow most important of which are the Islamic Movement of Uzbekistan (IMU) also known as the Islamic Party of Turkestan and the *Hizb-ut Tahrir al-Islami* (Party of Islamic Liberation).[59]

Of the irrigated area of the Syr Darya Basin lie 45 percent in the Ferghana Valley. The ferghana Valley contains several of the most vital and productive irrigated areas, e.g. Jalal-Abad and Osh in Kyrgyzstan; Andijon; Namangan, and Ferghana in Uzbekistan, and leninabad (Khujand) in Tajikistan. All these areas rely on the Syr Darya for irrigation. The competition for scarce resources between the different ethnic groups in the Ferghana Valley could have great effects on the mutual interstate relations. Particularly, the predominance of Uzbeks in the Ferghana Valley (about three-fourths of the population) contributes to tensions among the different ethnic groups. Waters that originates upstream in Kyrgyzstan flows through the Ferghana Valley. A reduction of the water flow through the Valley by Kyrgyzstan could exacerbate tensions between ethnic Uzbeks and ethnic Kyrgyz[60]

5. Environmental Security in post-Soviet Central Asia

Environmental issues were part of the political trends during the Soviet period although often having a rather nationalist character. As Horsman notes: "Grassroots opposition to environmental degradation and exploitation; inter-ethnic competition for land, water and other resources, […] [served] as a conduit for nationalist and republican elite challenges to Moscow's authority."[61]

Among the most important political movements that emerged during the late Soviet period in CA and were closely related to environmentalism were Nevada-Semipalatanisk in the Kazakh Soviet Socialist Republic (SSR) and Birlik in the Uzbek SSR. Nevada-Semipalatinsk was established in 1989. One day 5,000 people attended a gathering to hear the Kazakh poet O. Suleymenov in the hall of the Writers' Union in Almaty. During his talk he denounced nuclear testing and called for a public meeting the next day. Since then, the movement has contributed to the suspension of nuclear testing in Semipalatinsk, fostered links with international organisations that oppose nuclear testing, and organised investigations to examine the level of radiation sickness in the area.[62]

Like Nevada-Semipalatinsk Birlik opposed environmental degradation in Uzbekistan but was explicitly more nationalistic.[63] In Uzbekistan environmental issues were associated with ethnic local violence in the 1980s in Batken-Isfara, Osh and Samarkand.

For example, in the City of Osh in 1990 Uzbeks and Kyrgyz inhabitants fought over land rights, after a Kyrgyz co-operative had received the right to use the irrigated land on an Uzbek Kholkhos to build residential buildings. During these riots over 300 people were killed and 1000 were injured. As a result of these clashes the Uzbek minority in Kyrgyzstan claimed an independent status of the Osh region.[64]

Since independence in 1991 of the CA countries from the Soviet Union environmentalism has not a political status as during the Soviet period anymore. Horsman explains this fact by the following three developments:

■ The nationalist aspect of these activities has been removed since Moscow no longer is a focus of common action for republican elites, nationalists and environmentalists;

■ The political and economic problems in post-Soviet CA weight heavier than environmental political activism;

■ The current political elite of the CA states that also belonged to the Soviet elite discourage any criticism of their former and present roles in their countries' economic and environmental mismanagement.[65]

However, besides building their own nation states and national economies what the CA countries immediately after independence were concerned about was the question of how to share their water and other resources and how to co-operate on these issues.[66]

Several regional and bilateral inter-state agreements, joint commissions, and common development of policies and measures on the allocation of water have been concluded and

carried out between the CA countries in recent years. Conflicts on access to water seem less likely than previously thought.[67]

Already in November 1991, the five ministers of water management of the CA states started to develop policies on how to commonly manage the Aral basin. On February 18, 1992, when all the CA countries had received their independence, the five ministers signed the first agreement on 'Cooperation in the Management, Utilisation and protection of Water Resources of Interstate Sources," in which the states "committed themselves to refrain from any activities within their respective territories which, entailing a deviation from the agreed water shares or bringing about water pollution, are likely to affect the interests of, and cause damage to the co-basin states."[68]

Up until now several collaborative environmental initiatives have been started in CA. For example, the Regional Environmental Centre with head offices in Almaty, Kazakhstan was established in 2001. It deals with regional inter-state environmental problems. Two other important inter-state organisations are the Interstate Coordination Water Commission (of the International Fund for Aral Sea) and the Central Asian Economic Community.

They supervise the rehabilitation of the systems that control water flow and policy formulation. In July 2002, a meeting was held on regional ecological safety issues. During this meeting the emergency and environment ministers from CA states discussed the development of a common strategy for environmental disasters prevention and environmental protection. Every CA state has developed a National Environmental Action Plan, mainly initiated by the World Bank.

In 1993 a Central Asian Interstate Commission on Sustainable Development (ICSD) was established that is developing a Regional Environmental Action Plan (REAP) to deal with issues of sustainable development and environmental challenges in the CA countries. The ICSD comprises15 members, representing Ministries of Environment, Finance and Science from each country. As it is generally acknowledged that inter-state environmental issues are linked with security co-operation between ICSD and state security and defence agencies are encouraged. The success of the REAP however depends on its implementation by the governments and the commitment of its donors.[69]

The OSCE, UNDP and UNEP initiated the long term *Environment and Security Initiative* (ENVSEC) with regional workshops in Belgrade for South-Eastern Europe in December 2002 and in Ashgabad for CA in January 2003. The ENVSEC acknowledges the relations between environmental degradation, scarcity of resources, competition for access to scarce resources and conflict and that environmental co-operation could be a tool to prevent conflict and be a bridge for co-operation in other areas later on.[70]

In May 2003 the fifth Ministerial Conference 'Environment for Europe' took place in Kiev. For the post-Kiev period the Initiate identifies the following main goals:

"■ improve the methodology to map environmental risks to security and conduct integrated regional assessments of vulnerability to environmental stress posing threats to security;

■ identify areas and means to foster environmental co-operation within, between and among states to overcome political, economic, ethnic and historic tensions thus contribution to peace and stability;

■ integrate environmental considerations into foreign and security thinking and policymaking and –vice versa- integrate provisions for early warning and conflicts prevention into sectoral policies such as environmental policy;

■ further develop the initiative after its successful pilot phase from September 2002 to May 2003 into a two or three year full program."

It is expected that three founding organisations UNEP, UNDP and OSCE will be joined by other organisations at a later stage, such as the UN ECE, NATO, EU and REC.[71]

The successful implementation of environmental agreements are prevented by a complex of causes: The CA countries have only limited institutional structures, technical capabilities, lack of finance and human resources, as well as little or ineffective co-ordinating structure of the legislative and institutional base. Additionally, almost all branches of government depend on external assistance. External debt has also slowed down the pace of reform.[72]

Regional co-operation: a way towards management of the environment, political stability and economic development?

The environmental risks in CA discussed above pose risks not only to human health and personal security but also to regional stability.

Environmental risks develop to security risks when there is a lack of access to resources for basic needs (water, soil, air and energy), when widespread negative impacts on public health become evident and when agricultural productivity, energy security and economic development are prevented. They do not necessarily trigger violent conflict, but tension could increase drastically when the environmental pressures accumulate and coincide with unfavourable social, economic and political conditions such as an overall lack of democratic political culture, a weak governance structure, poverty, mass migration, high unemployment, demographic pressure, incursions of Islamic extremists and ongoing border disputes.

Co-operation between the CA states at the regional level is necessary not only to reduce environmental pressure but also to reduce the security risks that derive from it. Inter state co-operation particularly on water allocation has been subject of various regional and bilateral negotiation processes in recent years, often resulting in formal agreements, joint commissions and the development of policies and measures for joint water management.

Yet, agreements are not enough if they are not efficiently implemented.

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[1] Comprising the five former Soviet republics Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan

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[4]. Based on Amineh, Mehdi Parvizi, *Globalisation, Geopolitics and Energy Security in Central Eurasia and the Caspian Region,* (Den Haag: CIEP, 2003), 39-43; 'Addressing Environmental Risks in Central Asia: Risks-Policies-Capacities', *Environmental Governance Series,* (2003).

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