

**SUSTAINABLE DEVELOPMENT AND
REGIONAL COOPERATION IN
CENTRAL ASIA, 1995-2005**

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CERTIFICATE

This is to certify that the dissertation entitled, “**Sustainable Development and Regional Cooperation in Central Asia: 1995-2005**” submitted by me for the award of the degree of **MASTER OF PHILOSOPHY** is my original work. This dissertation has not been previously published or submitted for any other degree of this university or any other university.

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We recommend that this dissertation be placed before the examiners for evaluation.

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CHAPTER I

SUSTAINABLE DEVELOPMENT: AN INTRODUCTION

Global environmental issues have now become complex problems. Even though they are perceived as environmental problems, several social, political, and economic issues are linked to them and as a result, they act as barriers, which have to be overcome so that sustainable use of natural resources of our planet can be ensured.

When we deal with sustainability, we must be able to clearly differentiate between natural environmental change and that which is caused by human beings. Natural environmental change is a continuous and constant process. It is not a bad thing always and has the potential to create various new opportunities and habitats. However, it is agreed that the environment change now is occurring more rapidly than it was previously. Such rapid rates of environmental change are posing more challenges to ecosystems as well as to humans. Extremely rapid rates of change leave very little time for ecosystems, or for the people living within them to adapt to the change. When the pace of gradual change is accelerated to the limit where changes start occurring as shock events, ecosystems and human livelihood systems may be destroyed¹. Human demands are increasing with the growth of population, but the resources at our disposal were, and are limited. The reckless exploitation of these resources is causing a serious imbalance today.

It is very essential to acknowledge that environment is dynamic and changing. The challenge is to work alongside the environmental change to ensure sustainable development. The environment which provides the resource for supporting the population and supports us to attain growth and progress has to be managed through protection and conservation. The notion that, for the benefit of the future generations, the present generations should be modest while exploiting natural resources has found widespread acceptance internationally, as early as in

¹ Sustainable Development is a comprehensive economic, social, cultural and political process, which aims at the constant improvement of the well being of the entire population and of all its inhabitants on the basis of their active, free and meaningful participation in development and in fair distribution of benefits resulting therefrom – UN 1986, Frances Harris (ed.), *Global Environmental Issues*, (UK: John Wiley & Sons Ltd., 2004), p.267

1967 when a Maltese proposal was made at the UN General Assembly². Here it was agreed upon that humankind has a common heritage and this heritage has to be provided with international protection. Sustainable development became the buzzword in the 1970s and 1980s and has been used by various sections of people such as – environmentalists, politicians, and economists. It was the Brundtland Report (WECD.1987)³, which finally helped the goal of sustainable development to gain a foothold in the world arena. “Sustainable Development” has several dimensions, based on the values and goals of the individuals. For an economist, it is an economic progress where in the quantity and quality of our stocks of natural resources, such as the forests and the integrity of bio-geo-chemical cycles like climate are sustained and passed on, unharmed to the future generations. To a socio-ecologist it can mean sustained use of the forests, and for an environmentalist it can imply a clean and healthy heritage for our children. Still, to some others, it means persistence and the capacity of something to continue for a long time. Thus, there exist several dimensions of the concept of sustainability. They are as follows:

Environmental Dimension:

The natural-environmental constraint to (human) development is the main reason for any concern about sustainability. More precisely, the economic processes of production and consumption draw to a greater or lesser extent on services provided by resources of the natural-physical environment. These resources are of two broad types: natural resources (in the conventional narrow sense) and environmental resources. Natural resources of the conventional type - recognized by economists as crucial inputs to most production processes - include non-renewable such as minerals, renewable such as forests, and all forms of energy. They have been studied for a long time, so that policies dealing with them can build on a whole body of theoretical and empirical knowledge⁴.

² M Redclift, *Sustainable Development: Exploring the contradictions*, (London: Methuen, 1987), pp.6-12

³ The WCED was formed by the UN in 1983. This commission was known for developing the broad political concept of Sustainable development. It published the report – OUR COMMON FUTURE, which is also known as the Brundtland Report in April 1987.

http://en.wikipedia.org/wiki/World_Commission_on_Environment_and_Development

⁴The Problem of Sustainable Development/ <http://www.globalissues.com/>

Sustainable Development is not just about economic growth, it is about improving the quality of life for people and communities, and this requires attention to ecological sustainability⁵.

Environmental resources have come under the purview of analysts more recently. Nevertheless, fairly well developed tools are now available for their analysis. In general, environmental resources provide services not only for immediate human consumption but also for use in connection with production as well as consumption processes. The former services sustain the biological basis of human life and well-being as well as provide for enjoyment of natural resources by people. The latter services derive mainly from the absorptive capacities of the physical environment and as such contribute to human well-being⁶.

Economic Dimension:

The growth of economies and their structural transformation have always been recognized as being at the core of development. They still are the most important preconditions for the fulfillment of human needs and for any lasting improvements in living conditions. In addition to the quantitative, economic aspects of development, an increasing number of qualitative aspects have come to be recognized too. The main argument is that neither economic growth in the aggregate nor growth of income at the personal level is sufficient to guarantee progress of an entire society. Accompanying qualitative changes are needed as well⁷. These changes can be achieved through increasing efficiency in material use, recycling, conservation and controlling economic consumption⁸.

Social Dimension:

Seen from a broad angle, development encompasses the strengthening of the material income base as well as the enhancement of capabilities and the enlargement of choices. Such a

⁵ Philip Flood, 'Sustainable Development : The Way Ahead', *Biss Journal*, Vol. 16, No. 1, 1995, p.37

⁶ C Perring, *Ecological Sustainability and Environmental Control*. (Canberra: Centre for Resources and Environmental Studies, ANU: 1991), p.35

⁷ Philip Flood, *op.cit*, p.37

⁸ World Commission on Environment and Development. (Oxford: Oxford University Press, 1987), p.43

view of development clearly transcends the narrow concept of developments based on economic-growth and emphasizes the importance of social development in the context of sustainable development⁹. It emphasizes that the key are human beings, whose pattern of social organization is crucial in devising viable ways to achieve sustainable development.

There is one more argument for including social issues under the concept of sustainable development. This argument is part of the general discussion on sustainability and can be described in the following way: equity considerations are vital to the notion of sustainable development. More precisely, inter-generational or inter-temporal equity forms one of the cornerstones of the concept. As a consequence, the issue of intra-generational equity cannot be excluded from a comprehensive notion of sustainable development, because doing so would destroy the symmetry of the equity-argument on which the term 'sustainable' is built. Hence, intra-generational equity -- covering the whole gamut of social issues in development, such as regional and gender distribution is rightly considered as an integral part of sustainable development¹⁰.

As we seek to understand sustainable development, the first question, which arises, is what is to be sustained? Does sustainable development aim at sustaining the environment, people's livelihoods, or economic growth? The concept of sustainability is used in an environmental sense, and is referred to saving the environment, which implies maintaining ecological systems, habitats, and natural resources. Human activities ought to be environmentally sensitive with respect to natural resource use and pollution and in order to achieve it significant changes are needed in our utilization of environment, our way of living and in global economic growth. Sustainability represents an economic state where demands placed upon the environment by the people and industries can be taken care of without reducing the capacity of the environment to provide for future generations as well as the other species. But in any case we are confronted by the same question i.e. to what extent can the

⁹ Robert B Potter, Tony Binns, Jennifer A Elliott and David Smith (eds.) *Geography of Development*, (England: Addison Wesley Longman Ltd., 1996), pp.34-50

¹⁰ B. Stallings, 'The International Context of Development', *Items*, Vol.47, No 1, March 1993, pp.1-6

natural resources be exploited – for the sake of short term economic benefits – without gravely compromising the earth’s ability to sustain life in the long run¹¹.

The World Commission on Environment and Development in “Our Common Future” has defined sustainable development as *development that meets the needs of the present without compromising, the ability of future generation to meet their own needs*¹². This definition contains certain concepts within it:

Firstly the concept of ‘needs’, where priority has to be given to the world’s poor. The needs comprise of a secure and adequate means of income, proper shelter, healthcare, education, security, and amenities and secondly the idea of limitations imposed by the state of technology and social organizations on the environment’s ability to meet present and future needs. A minimum sustainable development must not endanger the natural systems that support life on Earth: the atmosphere, the atmosphere, the waters, the soils and the living beings. This implies economic development should not cross the limits of the carrying capacity of our planet¹³.

These two above-mentioned concepts imply that sustainable development involves more than growth. It requires a change in the content of growth, to make it less material and energy-intensive and more equitable in its impact. These changes are needed in all nations as a part of a package of measures to maintain the stock of ecological capital, to improve the distribution of income and to reduce the degree of vulnerability to an economic crisis.

Therefore the main emphasis of “Our Common Future” is that essentially sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both the current and future potential to meet human needs in addition,

¹¹ Frances Harris (ed.), op.cit,p.267

¹² World Commission on Environment & Development,op.cit, p.43

¹³ James, Meadow Croft, ‘Sustainable Development – A New (Ish) Idea for a New Century?’ *Political Studies*. Vol.48, No.2, 2000 (Special Issue), pp.370-87

aspirations¹⁴. Sustainable Development puts a lot of emphasis and shows concern for equity and fairness. This implies ensuring rights of the poor and of future generations. The precautionary principle of making decisions, keeping in view the long term effects, is also an important factor. It is also essential to understand the interconnectedness between environment, economy and society.

In the present context, sustainable development involves more than just conservation of natural resources; it implicitly assumes the continuation of human communities and human life. For their needs human societies depend on and revolve around more than natural capital. The other forms of capital consist of physical and financial capital, human capital and organizational capital. To a certain extent, all forms of capital are fungible¹⁵.

But despite the relationships and mutual dependencies which the various forms of capital share, there is still something special about natural capital (in its own right and with regard to human communities). It is so because all the other forms of capital can be built as quickly as they can be spoilt, but the same thing cannot be said about natural capital.

The air, the wind, the water, the atmosphere cannot be restored within either human lifetime or with equal amount of expenditure of other forms of capital. Even mobilizing all its various forms of capital, humanity probably cannot prevent mass extinctions, reduce concentrations of carbon in the atmosphere, or remove polychlorinated biphenyl in the oceans by the end of the twenty-first century. However this broad perspective does not imply that economic development should be neglected particularly in developing countries where there is colossal poverty and unemployment along with inequity and insecurity: instead, economic development has to assume a major role in the policy making programmes of these nations. The Central Asian countries face the monumental task of creating a development model more suitable for their particular social and natural environment. In the process they will need to

¹⁴ Baidyanath Mishra, 'Sustainable Development – Problems and Challenges of 21st Century', *IASSI Quarterly*, Vol.19 No.2, 2000, pp.57-76

¹⁵ M Schroder, 'Sustainable Development – A Principle for Action and an Instrument to Secure the Conditions of Survival for Future Generations?', *Law and State*, Vol.51, 1995, pp.101-13

reconsider their economic priorities in favour of what brings most benefit in the long run: harmony amongst their people with nature¹⁶.

Today apprehensions are expressed that without remedial measures, these states may face the bleak prospect of the collapse of the life style that the societies are currently leading. On the other hand, never before in the history have there ever been attempts on the same scale as we witness today, by these transition economies, seeking to usher in socio-economic development to provide for people, the means to realize self-fulfillment and create a society which is genuinely harmonious and free from want and deprivation.

A Brief Introduction about Central Asia:

The term 'Central Asia' has been used in various contexts to describe, in whole or in part, a vast swathe of the Eurasian landmass. Historically several terms have been used to describe parts of the Eurasian landmass. Among them the term having the longest history of usage is 'Turkistan/Turkistan'. It's a word of Persian origin and means 'the land of the Turks'. Its use was prevalent in the seventh and eighth century. In the second half of the 19th century, 'Turkistan' acquired a political connotation when the term was incorporated into the official designation of the Tsarist colonial administration in the newly conquered Asian territories, and hence forth it became the 'Governorate General of Turkistan'¹⁷.

The earliest term to be used in English for the Central Eurasian steppe was 'Tartarie' (i.e. 'land of the Tatar Mongols'), first recorded in the 14th century. The term 'Trans Oxiana' meaning 'across the Oxus' (Oxus is the classical European term for Amu Darya) was also in popular use, although it generally referred to the area lying between the Amu Darya and Syr Darya¹⁸.

¹⁶ Baidyanath Mishra. op.cit, pp.57-76.

¹⁷ Shirin Akiner, Tideman, Sander and Hay, Jon (ed.), *Sustainable Development in Central Asia*, (New York: St. Martin's Press, 1998), p.325

¹⁸ Ibid



SOURCE - <http://www.envsec.org/centasia/maps>

The most common terms in use were 'Inner Asia' and 'Central Asia'. Since the collapse of the Soviet Union, the terminology in use has undergone a change. In the present times the five newly independent states of Kazakhstan, Turkmenistan, Tajikistan, Uzbekistan and Kyrgyzstan have adopted the term "the Central Asia" as their collective designation¹⁹.

Central Asia is a place of huge cultural and ethnic complexity. It can be aptly described as a four-dimensional kaleidoscope where social, economic, political and cultural elements continually collide, overlap, merge, fragment and reform²⁰.

The ecosystem of this region is as varied as its culture and people. Characteristic features include rolling grasslands in the northern region, deserts in the centre and a crest of high mountains down south. In the central region the climate is very extreme and there is a great seasonal and diurnal variation in the temperature. Water is scarcely available as most of the rivers drain inland. Low precipitation and high evaporation create a very harsh environment. Blizzards, biting winds and dust storms are regular features of the region. The population density is extremely low. In the far north, beyond the trees lies the tundra²¹. This region experiences long and severe winters with very low temperature. The ground is extensively covered with permafrost. The tundra is very sparsely populated and main source of livelihood in this region is through hunting and trapping. Next in line is the taiga²² or the forest zone that comprises of the area from Baltic Sea to the Sea of Okhotsk. The main vegetation is of coniferous trees. The Ural Mountains dissect this region into north and south and at the same time form a natural boundary between Europe and Asia. The climate is extreme in this region as well. The forests then merge into the steppe²³ zone which is broad grassland. Several

¹⁹ SM Rahman (ed.), *Central Asia: Regional Co-operation for Peace & Development*, (Rawalpindi: Foundation for Research on International Environment National Development and Security, Friends, 1998), pp.10-13

²⁰ Shirin Akiner, Tideman, Sander and Hay, Jon (ed.), op.cit, p.7

²¹ Derived from a Finnish word meaning barren or tree less. It consists of plains, characterized by snow, ice and frozen soil for most part of the year. In such an adverse environment as the Tundra, few plants survive.
<http://www.radford.edu/tundra.html>

²² It is a Russian word for coniferous forests in Siberia. This forest belt of Russia is one of the richest source of soft wood for use in building construction, furniture, paper and pulp. <http://library.thinkquest.org/ccforest.html>

²³ The temperate grasslands are called the steppes in Eurasia. Dominate plant species comprise short and tall grass. <http://en.wikipedia.org/wiki/steppe>

mountain ranges (including the Altai) are a part of this region. It has continental²⁴ type of climate and the vegetation is good enough to provide fodder. Most of the area is well fed with water as it has rivers and lakes in abundance. The Danube, Dnieper, Yenisei, Lena and Amur are all found in this region. The majority of the populations in this zone are nomadic pastoralists. To the south of the steppe lies a belt of semi-deserts. The camel and wild horse are a common feature of this region. The deserts included in this zone are the Kyzyl Kum, the Kara Kum, and the Lop Nor, Taklamakan, and Gobi desert. The Tien Shan Mountains too are in this desert zone. This area is very thinly populated, water is scarce vegetation is sparse and people usually lead the life of nomadic animal herders. The desert zone is transected by a chain of oases and river beds. The most fertile part lies to the west of the Tien Shan, between the Amu Darya and the Syr Darya. Conditions in the oasis – river belt favoured the development of settled communities. The soil is potentially highly productive, but requires irrigation. Here agriculture is the way of life.

The southern margin of Central Asia is dominated by towering mountain ranges and high, wind swept plateaux. It has harsh and extreme climate, with meager vegetation. It's the domain of the yak. The people are engaged in small-scale subsistence farming, supplemented by simple art and crafts. This is how the whole of Central Asia is comprised of physically²⁵. Historically there are no obvious historical features that provide a framework within which we can locate the study of Central Asia. Since the early times Central Asian history has been marked by large-scale migrations of the people. All of it was multi-ethnic and the culture was syncretic in nature. It encompassed very large areas.

The degree of geographical mobility was extraordinary. This long distance travel assisted in the development of economic, cultural and technological exchanges over a wide expanse and even resulted in developing political and military contacts. Mainly China, Iran, India, and Russia exerted great cultural and economic influence over this area and in no way

²⁴ Typical of the middle latitude interiors of the large continents of Northern Hemisphere have this type of climate. It is characterized by winter temperature that supports a fixed period of stable snow and low precipitation in summer. The regions with this type of climate have tall-grass prairie as natural ground cover and include some of the most productive farmlands. http://en.wikipedia.org/wiki/continental_climate

²⁵ Shirin Akiner, Tideman, Sander and Hay, Jon (ed.).op.cit, pp.8-11

was it an one way process. From the distant past Central Asia has been a place of interaction between peoples of various races and cultures²⁶.

The first historically recognized people who dominated this region were the mounted Iranian nomads in the 1st millennium BC. These Iranians were mostly the Scythians, the Sakas and the Sarmatians. The first great sedentary power to incorporate a significant portion of Central Asia within its boundaries was the Achaemenid Empire of Iran. This happened in the mid-6th century BC. During this period several Iranian groups began to settle in the region and with them they introduced irrigated agriculture as means of livelihood. By the late 3rd century BC. The eastern part of Central Asia came under Chinese influence and control. It was Alexander the great, who established Greek rule in Central Asia in the second half of the 4th century by overthrowing the Achaemenid dynasty. Even though Alexander stayed in Central Asia for just two years but he left a lasting imprint on the region. But soon after Alexander's death the Greek rule in Central Asia began to atomize. It resulted in a power struggle among his successors which led to the loss of control over Central Asian provinces²⁷.

The next major rule on this region was exercised by the Kushans. The region reached its zenith in the first half of the 2nd century AD. The Kushan reign linked the central southern region of Central Asia to the Indian subcontinent and thus opened the way for the formation of new cultural and economic networks. This added a fresh dimension to the development of Central Asia, especially in the realm of art and religion. The Kushans played a pivotal role in facilitating transcontinental trade and in shaping transcontinental diplomatic relations. In the 3rd century AD Central Asia again became a part of the Iranian empire under the Sassanids. This resulted in a period of revival and expansion of cultural, economic and political influences emanating from Iran.

The 5th century ushered in yet another period of upheaval. It began with a series of invasions, accompanied by mass shifts of populations and it went on till the middle of the 8th

²⁶ Anthony Hyman, 'Central Asian Republic: Independence and After'. *Round Table*, Vol.341 January 1997. pp.35-40

²⁷ Olga Oliker and Barbara Stove Gingerich . *Faultlines Of Conflict in Central Asia and South Caucasus*.(Rand Corporation .2003). <http://www.rand.org/>

century. These movements set in motion a process of change, which eventually led to a radical transformation of the ethnic and cultural map of Central Asia. The first was the invasion of the White Huns who swept across Central Asia in the second half of the 5th century. The second great movement was of the Turks who came from Mongolia. In An extraordinary short space of time they established control over a vast domain. This empire was known as the Turkish Khaghanate. It was very powerful and even established diplomatic relations with neighbouring nations.

Meanwhile the Arab troops also made rapid inroads into Central Asia. They progressed till the Tien Shan and after that they concentrated on consolidating their position in south-western Central Asia. They even entered into diplomatic alliances with the Tibetans. The Arab conquest of Transoxiana fixed south-west Central Asia firmly within the orbit of the Caliphate. Although geographically on the borderlines, this region became fully integrated into the world of Islam. The people came to share the same system of values as Muslims in the Middle East. The islamisation of the population occurred within a very short time span. The Mongols were the driving force of the last great eruption of nomad power²⁸.

The unification of the Mongols and the neighbouring tribes took place under the leadership of Genghiz Khan in the first decade of the 13th century. For the first and only time in its long history, Central Asia, in the widest geographic interpretation of the term, was united under a single ruler. Nevertheless, after Genghiz Khan his empire slowly disappeared. Another mighty Central Asian empire was founded at the end of the 14th century by Timur. He made Samarkand as his capital and established it as a leading centre for the advancement of science, art and architecture. After Timur's death, the Timurid dynasty fragmented even more rapidly than that of Genghiz Khan. However Timur was not the last of the great Central Asian conquerors. Almost a century later, one of his descendants was to win an empire that was almost as large and to found a dynasty that was to remain in power considerably longer. But this time it was not Central Asia but India and the ruler to do so was Babur²⁹.

²⁸ Giles Whittell, *Central Asia: The Practical Handbook*, (London: Cadogan Books, 1993), pp.43-45

²⁹ Shirin Akiner, Tideman, Sander and Hay, Jon (ed)op.cit, pp.23-27

The modern political geography of Central Asia began to take form in the 17th century. After disintegration of the kingdoms of Genghiz Khan and Timur the region had dissolved into an array of independent entities – nomad confederations in the steppe and desert, city states in the oasis belt, small fiefdoms in the foothills of the high mountains.

Central Asia under the Russian Rule

However, from the 17th century onwards the situation changed as Russia and China, and later British India, vied for influence in the region. Great power rivalry - “the Great Game”³⁰ intensified in the 19th century. By the turn of the century, the whole of Central Asia was under the domination, directly or indirectly, of one of these states. Russian expansion into Central Asia was achieved in stages. The first one took place during 1580-1644, and it was the conquest of Siberia from the Urals to the Pacific.

The final thrust of this advance brought the Russians to the Amur River and result was confronting the Chinese. Diplomatic relations were pursued and a few peace treaties were signed. The second stage of Russian expansion came with the move towards the Kazakh steppes. It happened in 1680 – 1760 and by the beginning of the 19th century, most of the Kazakh tribes had been fully incorporated into the Russian empire and the remaining portion was under Chinese control. The Russians introduced colonial administration in the newly acquired territories. Next area of conquest was the territory between the Black Sea and the Caspian Sea and then the Amur region. This was immediately followed by the final stage in the form of the conquest of Transoxiana. It started with the capture of Tashkent in 1865. A colonial administration for the region was also created. The integration of the Central Asian territories into the Russian empire was greatly assisted by the construction of railway lines linking Transoxiana to central Russia; and these were of economic as well as strategic importance³¹.

³⁰ This term attributed to Arthur Connolly which is used to describe the rivalry and strategic conflict between British Empire and Tsarist Russian Empire for supremacy in Central Asia.
http://en.wikipedia.org/wiki/the_great_game

³¹ Devendra Kaushik, *Central Asia in Modern Times: A History from the early 19th Century*, N Khalfin (ed.), (Moscow: Progress Publisher, 1970), pp.40-64

The enlargement of the Tsarist Empire caused consternation amongst its neighbours. The Britishers in India tried to counter the Russian influence. The “great game” between Russia and Great Britain also took place for gaining control over this region. Russian empire settled its citizens in the newly occupied region, and embarked on plans to build the region into a major source of cotton. However, they only exploited the natural resources of Central Asia and underestimated the costs resulting from pollution of the natural resource flows. Soviet development policies in Central Asia also did not pay much attention to environmental issues³². The official Soviet image of the environment has consistently emphasized a need to transform or modify, to improve on nature’s handiwork³³.

The Central Asian Environment under the Russian Rule

The ecosystems of Central Asia are exceptionally fragile and the Russians ignored this fact completely. In the latter part of the 20th century much of the region was intensely developed and as a result its carrying capacity has been strained to the point of imminent collapse. The blame for it can be placed on the Russian government that imposed unsuitable and unsustainable development programmes on these vulnerable regions. Several plans were formulated to convert the existing agricultural economy of Soviet Union to an industrial economy. A problem which today the five Central Asian states face is their poor economic situation after independence and how can they reconcile the desire to develop a modern economy, with its expectations of continuing growth, with natural constraints that are inherent in a very delicately balanced ecosystem.

The Tsarist regime’s prime focus was on acquiring more and more of land and thus spread their sphere of influence in the region. At the same time the annexation of Central Asia also led to exploitation of natural resources. New crops were grown in the region keeping in mind the interests of the rulers and not of the area. Central Asia soon became a cotton producer and supplier of Soviet Union³⁴.

³² Shirin Akiner, Tideman, Sander and Hay, Jon (ed.), op.cit. pp.51-56

³³ Charles E Zeigler, *Environmental Policy in USSR*, (Amherst : The University of Massachusetts Press, 1987), pp.6-15

³⁴ Devendra Kaushik, op.cit. pp.65-94

Thus the problem of sustainability in the region mostly emerged from rapid and inappropriate industrialization and collectivization of agriculture during Soviet period. With its single focus on coming at par with the United States of America , the Soviet Union over exploited its abundantly available natural resources in Central Asia and in the long run it made no attempts to sustain those very resources.

The government provided incentives to the farmers through better marketing facilities, finance and credit facilities, transportation facilities etcetera. Cotton shipment to Russia increased with the creation of the first rail connection – the Trans-Caspian railroad. The acreage under cotton cultivation increased about thirteen times between 1885-1915. Central Asia became the cotton base of Soviet Union, but this sole focus on cotton led to negligence of other crops. These malpractices by the Soviet authority led to the creation of an unsustainable atmosphere in the Central Asian region³⁵.

³⁵ Ibid. pp.65-94

CHAPTER II

RESOURCES AND SUSTAINABILITY IN CENTRAL ASIA

The Central Asian landscape has a great amount of natural diversity, which includes the northern taiga forests and large southern deserts, several big rivers and fresh water lakes as well as some huge mountains. These diverse ecosystems contain some of the worlds' richest natural resources¹.

The Natural Resources of Central Asia:

The region has fertile soil which has been primarily used for cultivation of cotton. It is cultivated on the major rivers, which are the Syr, Chu, Vakhsh, Amu, Zarafshan, Surkhan and is also grown throughout the Ferghana Valley and along the Kara Kum canal. Some portions of the Amu and the Kara Kum Canal also produce tobacco and opium. Central Asia attracted attention in the earlier times as a source of grain which could be produced around the Ural and Ismim rivers in the Kyrgyz steppe in the north, around the Talas and Chu rivers in the center, and around the Zarafshan, Vakhsh, Surkhan, and Gunt rivers in the south and southeast. Mixed crops such as cereals, rice, and wheat are also cultivated in several areas. Orchards of apples and grapes are grown in abundance. Mulberry trees, for raising silkworm, are cultivated in the Ferghana Valley².

Next to cotton farming, herding sheep in the Amu and Kara Kum Canal regions, in eastern Badakhshan, as well as in the Syr and Surkhan Darya regions is of prime importance. The Kara Kum Desert, of course, is an ideal place for raising Bactrian as well as Dromedary camels. Cattle, in general, are raised in the east of the Caspian and on the Kazakh plateau, especially its western regions. Other places for raising cattle are around the Issyk Kul, on the Chu, Talas, and Naryn rivers, and on the slopes of the Tien Shan and the Pamir-Altai mountains. Eastern Badakhshan, the slopes of Hissar and Qarategin mountains, the Qurqanteppe region and the Hungry Desert along the Amu River and Kara Kum Canal also

¹ M Blinnikov, 'Biodiversity in Northern Eurasia', *Inner Voice*, March-April 1994, pp.13-14.

² G Binder, 'Protecting Russia's Biological Riches', *Conservation Issue (WWF)*, October 1995, pp.1-10.

yield to cattle raising. Although primarily in the Kyrgyz steppe, dairy is produced in ample amount in all the places mentioned above in relation to raising cattle and sheep. Central Asia is endowed with several water bodies, which facilitate fishing. Fishing has traditionally been undertaken in the main inland waters, especially the Caspian and the Aral as well as on the eastern shore of the Caspian in the Issyk Kul. While the Aral fisheries are no longer in operation due to ecological problems plaguing the Sea, the Amu Darya, Syr Darya, and the Kara Kum Canal continue to produce reasonably good catches³.

About 1.5% of the world's resource for antimony, mercury, and uranium lies in the Kyrgyz Republic, southeastern Uzbekistan, and Tajikistan. In addition, large amounts of lead, silver, and zinc are found in Achisay and in the Altai mountains. Gold is found in Murutau, the Altai mountains, the Kyrgyz Republic, southeastern Uzbekistan, and Tajikistan. Apart from these places gold and copper mines abound in Kounrad, and Jezkagan. The latter two places as well as Akchatau have large deposits of molybdenum⁴.

Akchatau is also known for its deposits of tungsten. Other minerals found in the region include asbestos in the Altai, chromium in Khromtau, and phosphate in Karatau. Coal in Central Asia is found in the Kazakh plateau, in the Muyunkum desert, east of Issyk Kul, and in the Naryn basin east of Ferghana. The Hissar mountains, the nearby Nebit Dag (Turkmenistan) and the Surkhan Darya region of Uzbekistan also have considerable coal reserves. Further, east, the Russians had been mining coal in Badakhshan, especially in the Murghab, since the beginning of the Soviet Union⁵.

Central Asia's petroleum and natural gas reserves are concentrated on the east shore of the Caspian. In the south, there are reserves in the west of the Kopet Dag and Nebit Dag mountains; in the center around Aqtau, and in the north by the Emba River. Smaller reserves are found in the Naryn basin east of Ferghana and on the Panj in Uzbekistan. The Surkhan Darya region and the southern fringes of the Kizil Kum desert, too, have considerable deposits

³Environment Problems in Central Asia³ <http://enringrida.no/aral/maps/asiecten1.html/>

⁴ Central Asia an Overview/ <http://www.angelfire.com/rnb/basisri/Centasia/Centasia.html>

⁵ G Binder, op.cit, pp.1-10.

of natural gas. From ancient times Badakhshan, both the part of it that is in Afghanistan and the part that is in Tajikistan, has been a good source of precious stones. Jewelers from throughout the world come to the Panj (especially the Kulab region) for the best types of stones available anywhere. Kulab, along with the Ferghana Valley also produces a major portion of the salt used in the region⁶.

The Geographical Features of Central Asia

In the present times, the following features characterize the Central Asian states:

- High annual and diurnal temperature fluctuations.
- Low rainfall
- High evaporation
- Fragile natural ecosystems
- Widespread soil erosion and land degradation
- Low rates of soil humus production and vegetative regeneration
- Low carrying capacity of pasture land
- High grazing pressure
- Intensive deforestation
- Limited water resources
- Low quality of drinking water
- Ecologically unique areas and ecosystems
- Rich wildlife resources including rare and endangered species
- High population growth
- Rapid economic changes and development⁷.

In near future the Central Asian region can be the model area of sustainable development based on traditional lifestyles and modern technologies. Thus the guiding principle in the case of a sustainable society is to satisfy the needs and not the greed of the

⁶ Central Asia : Environmental Assessment/ <http://www.mem.dk/aarhus-conference/issues/nis/assesasia.htm>

⁷Shirin Akiner, Tideman, Sander and Hay, Jon (ed.), *Sustainable Development in Central Asia*, (New York, St. Martin's Press: 1998), p.102

people, ensure comfort, not luxury and above all bring about equity with social justice. The twin goals of sustainable development are (a) restoration of the past ecological damage and (b) insulation of the country from damage as consequence of future development.

The Central Asian lands share numerous characteristics which are affecting their development potential, and those include:

1. land locked location
2. low degree of industrial development and poor infrastructure
3. scarcity of cultivable land
4. extreme climate
5. rich mineral resources
6. shortage of development capital⁸.

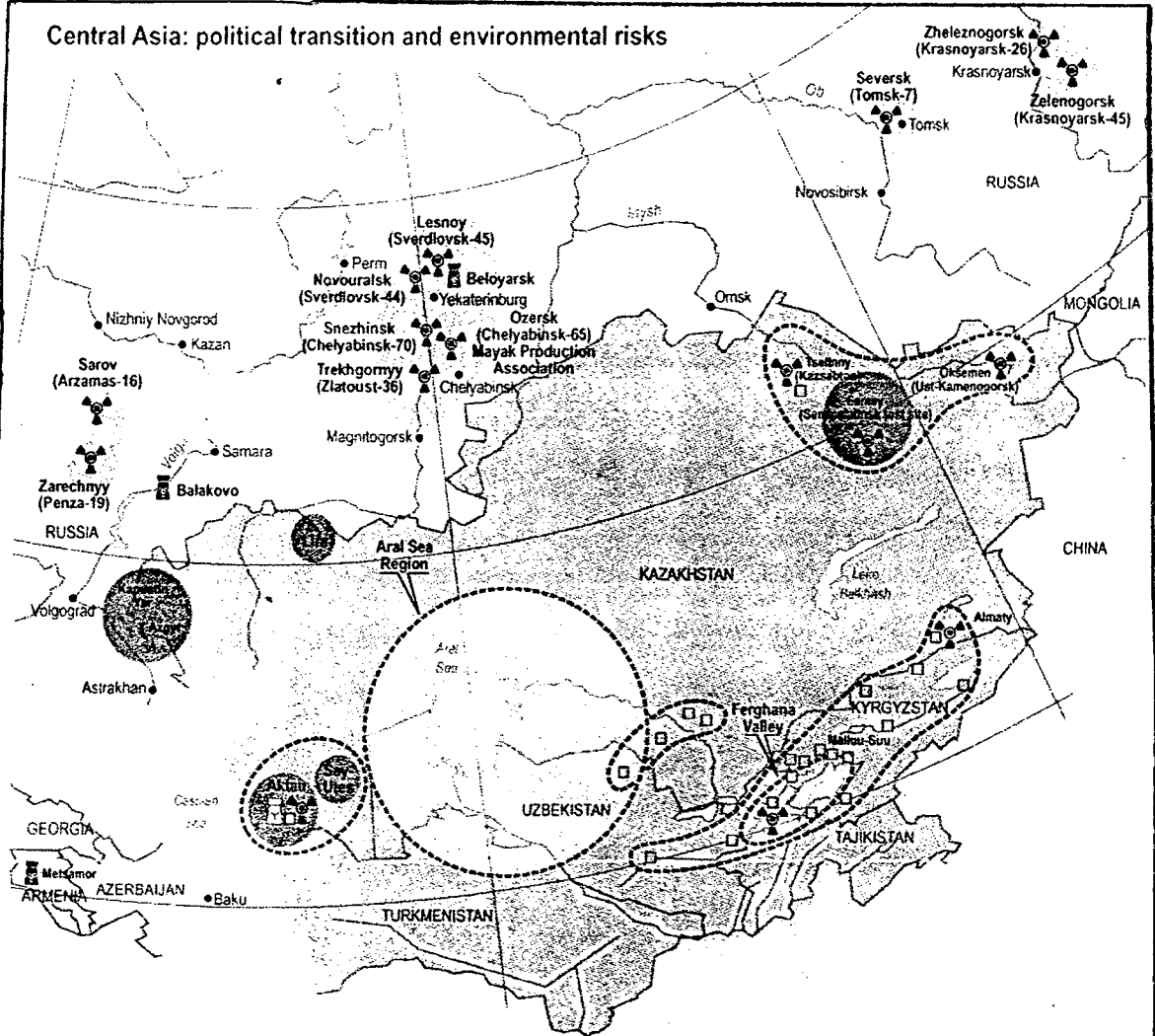
Most of the Central Asian governments regard the above-mentioned features as major obstacles on the way to progress. They were drawn towards the western notion of development which led to establishment of large capital and energy intensive centralized systems, which the local communities at grass roots level could not sustain for long.

The Soviet Rule in Central Asia and Its Impact on the Central Asian Environment

The major environmental event of this century in Central Asia was the Soviet rule. Like the nations in the west, Soviet economic, accounting and planning ideology for most of this century assumed that natural resource stocks were not scarce and underestimated the costs caused by pollution of the natural resource flows. We can say that environmental management was, for most of its existence, not the concern of the Soviet Union. With development and industrial progress enjoying sacred status in the Soviet political establishment, very few restraints were placed on the industrial development. The history of natural resources in Central Asia is that natural resources were steadily but very modestly reduced in the years before Russian rule, but they were seriously compromised during the Soviet era and still

⁸ Ibid, p.103

Central Asia: political transition and environmental risks



Nuclear legacies

- Nuclear power station (NPS)
- Nuclear powerplant closed or under construction
- Nuclear industry and research site (civil and military). Fuel production or recycling
- Radioactive waste site associated with uranium mines (active or closed) and other hazardous waste storage piles and ponds
- Nuclear weapons test site. Large areas contaminated with radioactive fallout
- Russian regions specialized in civil and military nuclear industries. Former relationship with Central Asian nuclear facilities.

Soviet legacy management

- Aral Sea and Surrounding Region**
 - Diversion of rivers feeding the Aral Sea led to exposure of seabed to open air, allowing airborne transport of salts and heavy metals in a perimeter of 600-800 km. Desertification and salinization of arable land, resulting in the collapse of fisheries and agriculture, impoverishment, and outward migration.
- Ferghana Valley**
 - Densely populated, ethnically diverse region with severely degraded forests and soils, limited rule of law, and widespread traffic in contraband merchandise. Lack of energy sources and supply and polluted waters. Region under the threat of collapse of radioactive and chemical waste taking ponds.

Water-related tensions:

- Conflicts over distribution of water between upstream and downstream countries. High economic dependence on irrigated agriculture (rice and cotton), with steadily deteriorating soils.
- Mines in Kyrgyzstan, Tajikistan and South Kazakhstan**
 - Presence of poorly-maintained radioactive and chemical waste sites in seismically active zone, located near highly populated areas and important surface water
- North-East Kazakhstan: Tselinnyy-Pavlodar-Semei-Oksemen and Aktau on the Caspian Sea coast**
 - Area contaminated with radioactive fallout from experimental nuclear explosions and inadequate waste storage. High mortality rate compared to Central Asian average.

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SOURCE - <http://www.envsec.org/centasia/maps>

further degraded after independence. The pollution of the present day is primarily linked to the past⁹.

The yardstick of Soviet progress was economic and industrial development. The natural world, the environment, and the quality of life were not major concerns in front of the concerns for resource extraction, factory construction etcetera. Enforcement of environmental laws was slow; and concern for welfare of future generations was expressed not through preservation of natural capital but through bequests of large quantities of human and physical capital¹⁰.

Most of the Central Asian regions' reason for unsustainable development can be very well linked to its Soviet past ; be it in the form of inefficient and ineffective policies, the Soviet emphasis on gigantisms, as well as certain elements inherent in the Soviet system. Instead of responding to the environmental problems the Soviet culture and government showed lack of interest in imposing restrictions on the factories causing harm, neither did it make concrete efforts to preserve the viability of natural resources. Once the environmental problems took the image of serious public issues, the responses were typical and mostly a failure. The nation did adopt certain variety of commands and control measures, but effectiveness and availability of those technologies was full of doubts.

Beyond best available technology approaches, the Soviet Union also made wide use of standards, like "maximum allowable concentrations" for industrial effluents and discharges. Yet, it was very well known how nocturnal violations, clandestine dumping, and other practices were common in the region. Experiments were also conducted in the region with quasi-market mechanisms to encourage environmental responsibility, but the finance department of the Soviet industry only with great difficulty was able to accommodate such reforms, and thus produced only a few noteworthy results. These time-to-time attempts encouraged to move the Soviet economy towards better environmental management, but

⁹ Annice Mahmood, 'Collapse of Soviet Union and its Implications for Central Asia', *Strategic Studies*, Vol.16, No.3, Spring 1994, pp.57-80.

¹⁰ Ruben A Manatsakanian, *Environmental Legacy of the Former Soviet Republics*, (Edinburgh: University of Edinburgh Press, 1992), pp.10-15

without major dislocations to the economy. When a full assessment was made of the performances of these policies, it was found that the full impact of those policies was not yet gauged when USSR collapsed and hence Central Asia inherited a wide range of destructive practices and policies from the USSR but had very primitive and faulty responsive mechanisms to these destructive influences¹¹.

Soon after the collapse of the Soviet Union, Central Asian states found many Western environmental donors coming to their rescue, especially the United States of America. They offered to share with Central Asia the experience of states, which had solved environmental problems. The explicit implication of early programmes and exchanges was that the West had achieved sustainable development, and that Central Asia would be able to follow the similar pattern of progress. And according to this logic, technological solutions to all problems both exist and are always the best solutions¹².

Central Asia's factories and agricultural systems are based on technologies and techniques that still depend upon massive resource throughput, low efficiency, and high levels of pollution. Because of the reduction of the private sphere under communism and the technological gigantisms of Soviet planning, Central Asia's development did not include within it the small and medium sized enterprises. Instead, it embraced several of the largest tractor factories, smelting operations, mining facilities, and nuclear weapons producing facilities on the planet. When such enterprises taxed the ability of local electricity grids, the Soviets did not make efforts to increase the efficiency, but they increased the capacity of the grids instead¹³. The Soviet system gave more importance to the output, whereas efficiency had very little practical relevance in a system in which valuations of inputs were clouded by lack of markets. This very lack of clear pricing and preference for immensity explains the scale of efforts in the region. These factors also clearly reveal the Soviet policies for pushing cotton production in Central Asia through the construction of the hugely inefficient Kara-Kum canal,

¹¹ Eric W Sievers, *Post Soviet Decline of Central Asia – Sustainable Development and Comprehensive Capital*, (London: Routledge Curzon, 2003), pp.30-32

¹² Donald Kelly (ed), *The Economic Superpower and the Environment*, (Sanfrancisco: WH Freeman, 1976), pp.25-27.

¹³ Charles E Ziegler, *Environmental Policy in USSR*, (Amhert: The University of Massachusetts Press, 1987), pp.6-10

building of a torpedo plant in Kazakhstan's capital city, and expecting northern Kazakhstan's semi deserts to become major wheat producers under the Virgin Lands¹⁴ scheme. This ultimately resulted in the undiversified Central Asian economy. Thus Central Asia's non-sustainable development rests on its Soviet past, impoverished, and economically unviable present¹⁵.

We now focus on the four main factors that have exacerbated the region's environmental problems. They are:

- the rapid and massive intensification of agricultural output
- the introduction of harmful and inappropriate industrial technologies
- the steep demographic growth
- the loss of traditional skills and knowledge¹⁶



Problems in these regions have cropped up due to over hasty and inappropriate forms of modernization. Policies to maximize the agricultural output were first introduced in Soviet Central Asia in the early 1930s and were practiced more comprehensively and more consistently for a much longer duration and the degree of environmental damage was also correspondingly higher in comparison to the surrounding regions¹⁷. The three major thrusts to Soviet agriculture in Central Asia were:

- the expansion of the cotton crop (particularly in Uzbekistan and Turkmenistan)
- the introduction of grain cultivation into the "Virgin Lands" (the unploughed steppes)
- the increase in head of livestock (especially sheep for wool production)¹⁸

All of this triggered chain reactions. From the beginning, the Central Asian economy was based on agriculture, characterized by the size of holdings and the primitive techniques of farming which kept productivity of labour at a low level. Policies to intensify agriculture

¹⁴ The 'Virgin Land' project was introduced by N Khrushchev. The aim of the project was to increase the Soviet Agricultural production by cultivating those lands which were previously unutilised. Charles E Ziegler, op.cit, pp.6-7

¹⁵ Ibid, pp.6-10

¹⁶ Shirin Akiner, 'Conceptual geography of Central Asia' in Shirin Akiner (ed.), *Sustainable Development in Central Asia*, (New York: St. Martin's Press, 1998), p.51.

¹⁷ Charles E Ziegler, op.cit, pp.6-7

¹⁸ Shirin Akiner, op.cit, pp.51-55

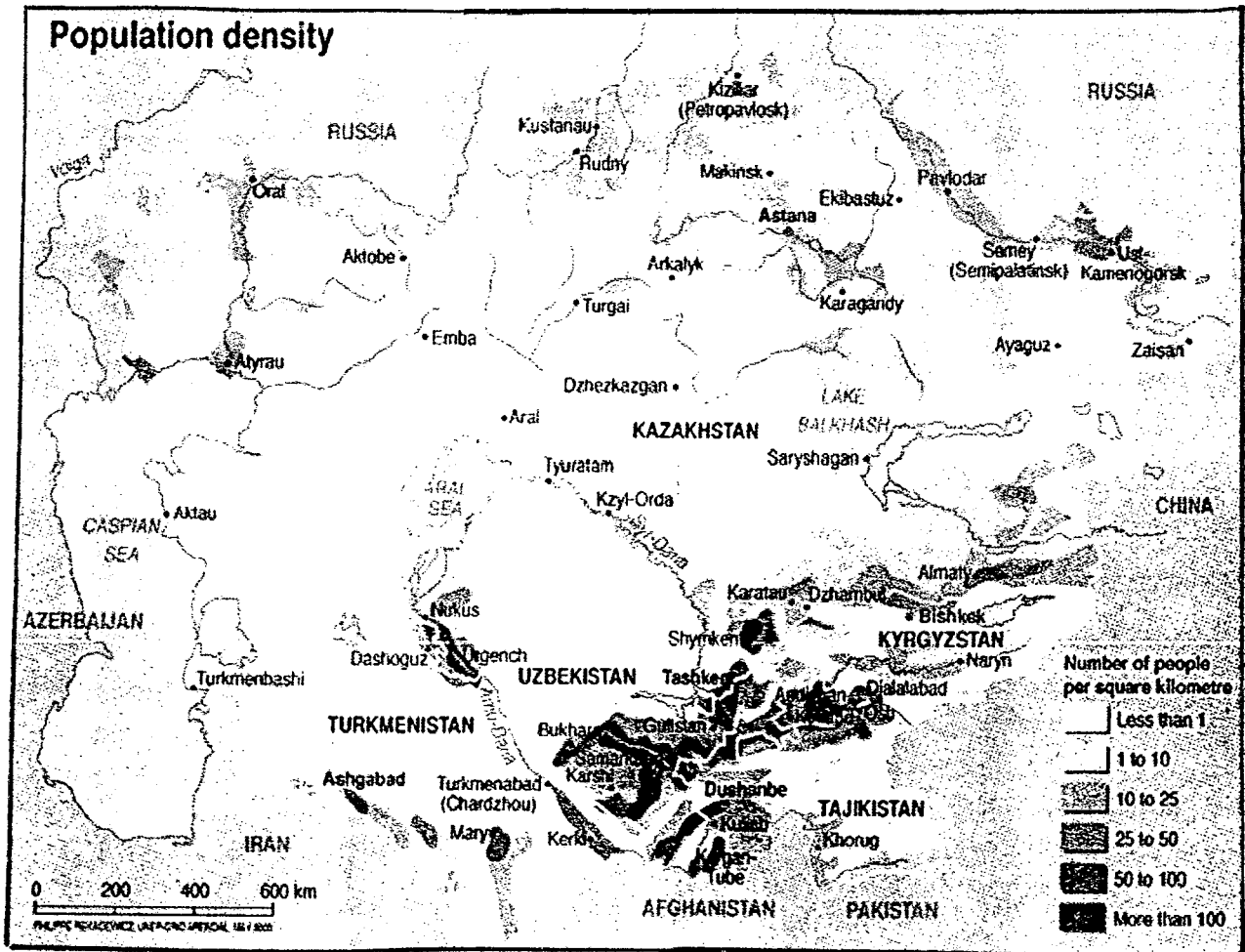
output were first introduced in Soviet Central Asia in the 1930, hence earlier than elsewhere in the region; they were also practiced more comprehensively and more consistently for a much longer period and the level of environmental damage was correspondingly higher than in the surrounding areas.

The region of Central Asia had caught the attention of the Tsarist Rulers as a potential region for cultivating cotton. This intention gradually turned Central Asia into a predominantly single commercial crop economy. Thus under the Tsarist regime the cultivation of cotton began to expand very rapidly in Central Asia. Efforts to grow cotton and increase its production resulted in creating a vicious circle of agricultural malpractices; which included the abandonment of crop rotation in favour of a monoculture, over-use of heavy machinery, that compacted the earth and eliminated all the living organisms, turning it into a dense, inert mass. Such practices brought down the level of fertility of the soil and further led to increased dependency on chemical fertilizers¹⁹. A vast increase in use of water for irrigation purposes also took place. This resulted in the depletion of the two main rivers in the region. The flow of water to the Aral Sea thus consequently diminished greatly and it began to dry up. This has not only resulted in chronic water deficit, the loss of the bio-resources of the sea, and a change in the regional micro-climate, but the exposed sea bed itself poses a major threat: sand as well as the toxic residue from the chemicals that were used to boost the cotton harvest are scooped up by the vicious dust storms and deposited over the surrounding countryside, leading to excessive desertification²⁰.

In certain areas of Kazakhstan and Buryatia, the cultivation of cereals saw initial success but soon soil erosion crept in. This was the result of poor land management and very unfavorable environmental conditions, such as weak soil structures, high winds and extreme ranges of temperature. Likewise in Kyrgyzstan and Tajikistan, the increase in herd and flock sizes led to severe ecological damages, such as deforestation, massive soil erosion and pasture

¹⁹ Ian Small and Noah Bunche, 'Aral Sea Disaster and Disaster of International Assistance', *Journal of International Affairs*, Vol.56, No.2 Spring, 2003, pp.59-74

²⁰ Boris Rumer, 'Central Asia's Cotton; the Picture Now', *Central Asian Survey*, Vol6, No.4, 1987, pp.75-88



SOURCE - <http://www.envsec.org/centasia/maps>

degradation – all were results of indiscriminate over grazing and over – trampling of the thin and fragile soil cover²¹.

Industrialization in Central Asia to date has been fairly limited. The main branches of industry were the heavy industries which in turn had links to extraction and processing of minerals. The technology employed in these enterprises was inevitably outdated, inefficient and environmentally harmful. As a result, in the immediate surroundings of the industrial plants the levels of air, soil and water pollution are very high. A far more greater threat was posed by the research and development activities that were carried out on the military facilities which were situated in the region.(this includes the former Soviet nuclear test site at Semipalatinsk in Kazakhstan and the Chinese nuclear test site at Lop Nor in Xinjiang and even the space centre at Baikonur)²².

The rise of population has always been a burden on the environment. The increasing population density problem is confined to certain areas of the region only. It is not spread across the entire region. Usually the most heavily populated areas are the ones which are well endowed with good reserves of productive land and have ample water resources; elsewhere the population is very thinly spread. But the striking feature in this cycle is the alarming rate in which the population density is rising. This rapid rate of increase has been largely the result of continuing high birth rates, along with falling infant mortality and longer life expectancy (owing to better health care, improved sanitation and hygiene). In Soviet Central Asia, there was an additional factor of the heavy influx of immigrants from the rest of the Soviet Republics²³.

The problem occurs because with the increase in population, the existing natural resources of the earth, including land doesn't increase. It works like a chain reaction because as the population increases, more mouths have to be developed, industries have to be set up, and on the whole, the production has to be increased. This is where the real dilemma of

²¹ Shirin Akiner, op.cit, pp.52-54

²² Donald R Kelly (ed), *The Economic Superpower and the Environment*, (San Francisco: W H Freeman, 1976), pp.32-33

²³ Ian Small and Noah Bunche, 'Aral Sea Disaster and Disaster of International Assistance', *Journal of International Affairs*, Vol.56, No.2 Spring, 2003, pp.59-74

development and environment come face to face with each other; because on the one hand there is the need to develop the agricultural production so that the needs of the growing population can be met, this itself requires modern technology, chemical fertilizers, pesticides etcetera. Agricultural development on large scale, with constant use of chemicals leads to water logging, soil degradation and is bound to create environmental degradation. On the other hand, rapid industrialization leads towards urbanization that is mostly unplanned, lacks adequate civic infrastructure and ultimately has a major role to play in the creation of severe environmental crisis²⁴.

The loss of traditional expertise is the fourth factor, which has played an important role in contributing towards the environmental degradation in Central Asia. Previously, a very harmonious and symbiotic relationship existed between the environment and development in Central Asia, when it was not occupied by the Soviet rulers. The ecology was well balanced. But this harmony was short lived. After the Russian invasion and occupation this coexistence and harmony declined. This to a great extent has been the result of the accelerated pace of modernization. In the socialist countries, development policies were framed, financed and implemented by central governments. There was very little consideration for local conditions or concerns²⁵.

Large scale projects occupied the place of family enterprises; the skills and crafts of the individual had no position in the new world. All of this resulted in creating an irreparable rupture with the traditional society. Within a decade or two, an entire way of life – a way of relating to the environment – was lost. The process of modernization which was driven from above caused the upcoming generations to regard traditional knowledge to be primitive and an obstacle to growth. It also caused an infliction of careless environmental damage as the instinctive understanding of the fragile ecological balance which the previous generations had nurtured was lost²⁶.

²⁴ Central Asia/<http://www.cacianalyst.org/>

²⁵ Robert P Larkin (ed.), 'People, Environment and Place: An Introduction to Human Geography', (London: Charles E Merrill Publishing Company, 1980), pp.8-18

²⁶ Shirin Akiner, Tideman, Sander and Hay, Jon (ed.), 'Sustainable Development in Central Asia, (New York: St. Martin's Press, 1998), pp.3-62

Due to all these factors Central Asia has inherited numerous environment related problems, and this includes: the damages caused by the Soviet military legacy, improper water management, land degradation, loss of biodiversity, industrial pollution, threat to the Caspian sea region, and harms caused due to drilling of oil and mining of minerals. The abundant natural wealth of Central Asian landmass and the traditional ecological way of living of many of the region's indigenous inhabitants are certainly not liabilities. On the other hand they offer a real prospect of sustainable and equitable improvements in standards of living.

Table 1
Forest Resources

		Closed Forests					Forest Ecosystems (1990s)						Number of tree species threatened, 1990s
		Original Forests as % of land area (a)	Forests as a Percent of Original Forest		Percent Frontier Forest (d) Threatened 1996	Tropical Forests		Nontropical forests		Sparse Trees and Parkland			
			Current Forest (b) 1996	Frontier Forest (c) 1996		Area (000 ha)	Percent protected	Area (000 ha)	Percent protected	Area (000 ha)	Percent protected		
Kazakhstan	267,076	2.6	22.9	2.9	100	0	0	2,638	9.6	0	0	---	
Kyrgyz Republic	19,180	8.4	14	0	0	0	0	785	0.2	0	0	1	
Tajikistan	14,060	50.7	4.2	0	0	-	-	-	-	-	-	1	
Turkmenistan	46,993	7.9	4.1	0	0	0	0	216	0.7	0	0	-	
Uzbekistan	41,424	2.8	10.2	0	0	0	0	231	0	0	0	0	

World Resources Institute, *World Resources 2000-01*

- a. Original forest refers to estimated forest cover about 8,000 years ago assuming current climatic conditions.
- b. Includes frontier and nonfrontier forests. These represent estimated closed forests within the last 10 years or so. Only closed moist forests are depicted for Africa and Asia. Woodlands and shrublands are excluded.
- c. Frontier forests are relatively undisturbed large, intact, natural forest ecosystems.
- d. Threatened frontier forests are areas where ongoing or planned human activities are likely to result in significant loss of ecosystem integrity (i.e., declines or local extinctions of species, changes in age structure of forests, etc.)²⁷.

²⁷ Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, (London & New York: Europa Publication, Taylor & Francis, 2005), p.13

Table 2
Forest Resources

Country	Protected areas (IUCN management categories I-V)						Number of marine protected areas ^a (IUCN categories I-VI)		Biosphere Reserves ^b		World Heritage Sites ^c		Wetlands of International Importance ^d	
	Number	Area (000 ha)	Percent of Land area ¹	No. of Area at least			Littoral	Marine	Number	Area (000 ha)	Number	Area (000ha)	Number	Area (000 ha)
				100,000 ha in size	1 million ha in size	Total								
Kazakhstan	73	7,337	2.7	18	1	1	1	0	0	0	0	0	---	---
Kyrgyz Republic	78	694	3.5	0	0	X	X	X	1	24	0	0	---	---
Tajikistan	19	587	4.1	1	0	X	X	X	0	0	0	0	---	---
Turkmenistan	23	1,977	4.1	5	0	1	0	1	1	35	0	0	---	---
Uzbekistan	11	818	1.8	1	0	X	X	X	1	57	0	0	---	---

Source: World Resources Institute, *World Resources 2000-2001*; World Conservation Monitoring Centre; United Nations Educational, Scientific and Cultural Organization; Ramsar Convention Bureau

- a. Includes areas with substantial terrestrial components that reach the shore. An area can be both marine and littoral.
- b. Biosphere reserves may be shared by several countries.
- c. "... " indicates countries that have not signed the World Heritage Convention. Site may be shared by several countries.
- d. "... " Indicate
- e. es countries that have not signed the Convention on Wetlands of International Importance.
- f. Extent of protected areas may include marine components that may lead to some unexpectedly high figures for percent of land areas protected²⁸.

²⁸ Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, (London & New York: Europa Publication, Taylor & Francis, 2005), p.14

Table 3**Carbon Dioxide Emissions from Fossil Fuel Burning, Cement Manufacturing and Gas Flaring**

Unit carbon content ¹ , 1999								
	Total	Total from fossil fuels	From solid fuel consumption	From liquid fuel consumption	From gas fuel consumption	From cement production	From gas flaring	Per capita CO ₂ emissions
	(000 tons)	(000 tons)	(000 tons)	(000 tons)	(000 tons)	(000 tons)	(000 tons)	(000 tons)
Kazakhstan	30,910	30,796	20,842	5,546	4,294	114	0	2.06
Kyrgyz Republic	1,340	1,287	504	417	314	53	0	0.27
Tajikistan	1,396	1,392	53	935	400	4	0	0.22
Turkmenistan	8,908	8,847	0	2,094	6,691	61	0	1.91
Uzbekistan	32,274	31,825	854	5,353	25,170	449	0	1.33

Source: Marland, G., T.A. Boden, and R.J. Andres. 2002. "Global Regional, and National fossil Fuel CO₂ Emissions", in Trends: A Compendium of Data on Global Change. Carbon Dioxide Information Analysis Centre, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. Reproduced by permission of Carbon Dioxide Information Analysis Centre (CDIAC)

1. Data in this table are reported as the carbon content of carbon dioxide emitted.
2. Kuwait includes Kuwaiti part of Neutral Zone.
3. Saudi Arabia includes Saudi part of Neutral Zone²⁹.

²⁹ Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, (London & New York: Europa Publication, Taylor & Francis, 2005), p.15

Table 4**Environmental Sustainability Index and Major Component Indicators³⁰**

Country	Environmental sustainability index		Air Quality	Water Quantity	Water Quality	Biodiversity	Land	Reducing Air Pollution
	Index	Ranking	Index	Index	Index	Index	Index	Index
Kazakhstan	46.5	88	-0.60	0.09	-0.41	0.21	0.79	0.51
Kyrgyz Republic	51.3	58	-0.28	-0.95	-0.35	0.54	0.23	0.56
Tajikistan	42.4	110	0.07	0.20	-1.81	0.27	0.33	0.33
Turkmenistan	37.3	131	-0.88	0.20	-1.33	0.05	0.43	0.50
Uzbekistan	41.3	118	-0.22	-0.11	-0.73	0.44	0.5	0.41

³⁰ Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, Europa Publication, Taylor & Francis (London & New York: 2005), p.16

Table 5

Environmental Sustainability Index and Major Component Indicators³¹

Country	Reducing water stress	Reducing Ecosystem Stress	Reducing Waste and Consumption Pressure	Reducing population growth	Basic Human Sustenance	Environmental Health	Science/Tech.,
	Index	Index	Index	Index	Index	Index	Index
Kazakhstan	-0.09	1.07	-0.57	0.92	0.52	0.57	-0.22
Kyrgyz Republic	-0.39	1.20	0.48	0.37	0.15	-0.03	0.20
Tajikistan	-0.70	0.49	0.87	0.45	-0.83	0.74	-0.09
Turkmenistan	-0.93	0.32	-0.23	0.58	0.46	-0.86	0.34
Uzbekistan	-0.66	0.35	0.25	0.23	0.57	-0.05	-0.04

³¹ Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, (London & New York: Europa Publication, Taylor & Francis, 2005), p. 17

Table 6

Environmental Sustainability Index and Major Component Indicators

Country	Capacity for Debate	Governance	Private Sector Responsiveness	Eco-efficiency	Participation in International Cooperative Efforts	Reducing Greenhouse Gas Emissions	Reducing Transboundary Environmental Pressures Index
	Index	Index	Index	Index	Index	Index	Index
Kazakhstan	-0.48	-0.83	-0.41	-1.02	-0.59	-1.60	0.41
Kyrgyz Republic	-0.02	-0.69	-0.41	0.26	-1.18	0.30	0.66
Tajikistan	-0.25	-0.81	-0.41	-0.86	-0.94	0.05	0.56
Turkmenistan	-0.63	-1.20	-0.41	-1.04	-0.61	-1.81	0.56
Uzbekistan	-0.71	-0.81	-0.41	-2.05	-0.13	-1.63	0.41

World Economic Forum in collaboration with: Yale Centre for Environmental Law and Policy, Yale University; and Centre for International Earth Science Information Network, Columbia University: 2002 Environmental Sustainability Index – An Initiative of the Global Leaders of Tomorrow Environment Task Force, World Economic Forum – Annual Meeting 2002.

The Environmental Sustainability Index is the average of the 20 major indicators.

Each major indicator is an average of values of its constituent variables

The units of constituent variables are standard deviations above or below the average for 142 countries³².

³² Regional Surveys of the World – Eastern Europe, Russia and Central Asia, 2005, (London & New York: Europa Publication, Taylor & Francis, 2005), p. 18

CHAPTER III

ENVIRONMENTAL PROBLEMS, ACTIONS AND ROLE OF NON GOVERNMENTAL ORGANIZATIONS

In order to understand the crisis of sustainability in Central Asia, it is important to go through the environmental problems faced by the region, which in turn further aggravate the crisis. There are numerous factors which together have contributed in creating a serious environmental crisis in the Central Asian Region most of the environment related problems which the region today faces are a part of its Soviet past. These factors are related to one another and together have created a major sustainability crisis in the region. We shall now examine them one by one.

(i) **Lingering Effects of the Soviet Military Establishment:**

There are many Soviet nuclear and aerospace ranges located in Central Asia and a lot of environmental pollution is caused by space ship fuel emissions. Hundreds of nuclear, chemical and biological weapons tests were also conducted at the Semipalatinsk/ Kurchatorv (Kazakhstan) nuclear test area, the Naryn (Kazakhstan) testing area, and on Resurrection Island in the Aral Sea. Nuclear explosions were conducted to solve certain economic problems as well. In many of these tests, radiations and chemicals escaped the test ranges to intrude upon nearby human settlements¹. Moreover, much of the uranium mined for Soviet nuclear weapons also came from open mines of Central Asia. An installation to extract uranium from the waters of Lake Issyk-kul operated in Kyrgyzstan for almost forty years. On top of all this the principal chemical and biological weapon production facilities were also located in Central Asia [Stepnogorsk and Karakalpakstan]². Numerous slag heaps and tailing sites of mining enterprises, where radioactive substances were utilized, salts of heavy metals, cyanides containing substances, caused serious harm.

¹ Donald Kelly (ed), *The Economic Superpower and the Environment*, (Sanfrancisco: WH Freeman, 1976), pp.25-30.

² Eric W Sievers, *Post Soviet Decline of Central Asia – Sustainable Development and Comprehensive Capita*, (London: Routledge Curzon, 2003), pp.30-36

The above-mentioned Soviet military practices in the past plague Central Asia even today. The radiation pollution around Semipalatinsk from testing and around many mining areas has also caused high levels of morbidity and has been causing various life threatening diseases³.

(ii) Water Crisis:

Water is the most important element of life on our planet. We can live without food for several weeks, but without water we cannot survive even for some days. Apart from bringing in political changes in Central Asian states, independence from former Soviet Union also led to creation of disputes among these states. One of the major disputes is the joint use of water resources by the five republics. Water resources for Central Asia are strategic, vital natural resource, having interstate significance. Human transformations of continental water have reached global scale, and are infringing the natural regime of the largest lakes and rivers of the world.

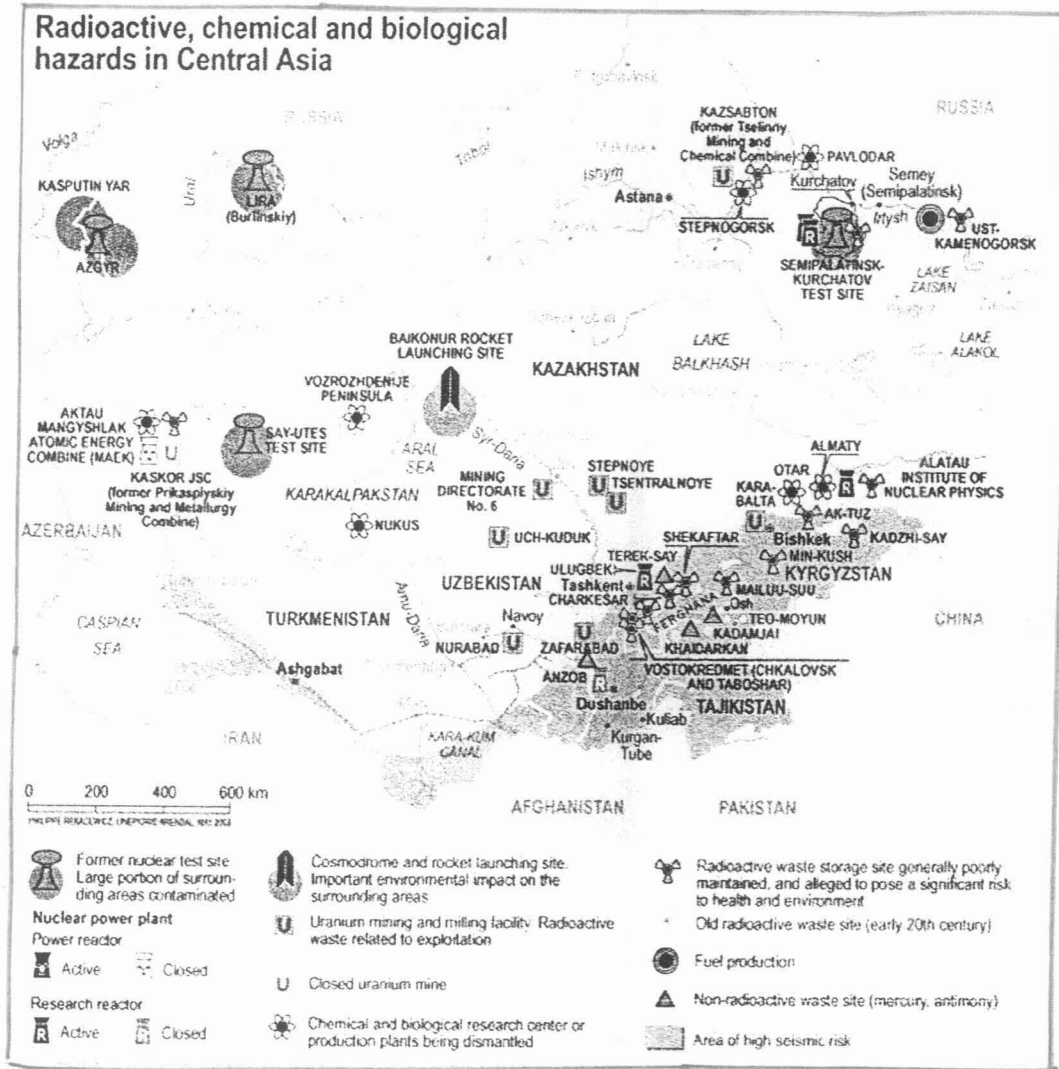
Central Asia is a dry and arid region with immensely diverse topography ranging from high mountains and glaciers to vast and dry steppes and deserts. The region is rich in water resources but more than 90percent are concentrated in the mountains of Kyrgyzstan and Tajikistan. The region's two main rivers, Syr Darya and Amu Darya, originate in these two countries, while Uzbekistan, the single biggest consumer of water, and Turkmenistan, are located downstream. As much as 40 percent of the region's water resources are concentrated solely in Kyrgyzstan⁴.

Soviet rule in this region dramatically changed the social structure, economy and even its environment; bringing about both modernisation and destruction. One of the issues that have left enduring legacies is the redrawing of the boundaries between republics which carried over into the post –Soviet era. The new borders did not respect any historical or national legacies, leaving huge minorities of one nation inside another republic and

³ RG Gidadhubli, 'Economic Transition: Issues and Problems' in K Wariko (ed.) *Central Asia Emerging New Order*, (New Delhi: Har-Anand Publication, 1995), pp.136-39

⁴ Michael H Glantz and Kobori, Iwao, *Central Eurasian Water Crisis: Caspian, Aral & Dead Seas*, (New York: The UN University, 1998), p.19

Radioactive, chemical and biological hazards in Central Asia



SOURCE - <http://www.envsec.org/centasia/maps>

creating complicated frontiers, which undermined political relations and made economic development more difficult⁵.

The Ferghana valley, the most fertile, densely populated area in the region, was divided among Kyrgyzstan, Uzbekistan and Tajikistan. It has been turned into a major cotton-producing valley during Soviet rule. In those days, the production system ignored the republics frontiers. For example: water reservoirs for the irrigation of cotton in Uzbekistan were constructed in Kyrgyzstan, Kyrgyz cotton was ginned in Uzbekistan and the route between them ran through Tajikistan⁶.

Rising water consumption began when the region was turned into a huge cotton plantation in the 1960s and the 1970s. An impressive irrigation network, canals, and reservoirs were built to serve cotton production. As a result, the region has developed into one of the world's biggest cotton producers, with Uzbekistan alone producing and exporting as much as four million tons of cotton annually. However this development has had disastrous effects on the environment. The region's two major rivers – Amu Darya and Syr Darya – were almost fully diverted for cotton irrigation, thus decreasing the water level of the two rivers. The efficiency of water use was also very low: the canals were unlined, leakage was extremely high and thus much of the water did not even reach the fields⁷. The Soviet regime built huge water reservoirs in Kyrgyzstan and Tajikistan primarily for cotton production. Several hydropower stations were also constructed. The power grids were united in the region to form a single regional network. Through this network, upstream countries exported electrical power to downstream countries during the winter, and imported water from them during the summer when water was drawn to cotton fields. Coordination of the water flows to cotton fields during the summer was controlled from Moscow⁸.

By the end of 1980s, water distribution and border disputes led to open confrontations, which were managed by Moscow. But when the Soviet Union collapsed,

⁵ Zainiddin Karaev, 'Water Diplomacy in Central Asia', *The Middle East Review of International Affairs*, Vol.9, No.1, March 2005, pp.2-3

⁶ Ibid

⁷ Alexander Sidorenko, 'Rational Use of Natural Resources in the USSR', in *The Problems of the Contemporary World*, No.107 Environmental Protection and Society, (USSR: 1983), pp.61-65

⁸ Zainiddin Karaev, op.cit, pp.2-3

water usage, which had previously been a domestic issue, suddenly became a subject of international mediation⁹.

In 1991 all Central Asian countries gained their independence from the Soviet Union though they were not well prepared for this step, especially given their tightly integrated economics and dependence on joint infrastructure and common resources. Moreover, the vacuum left by the collapse of the Soviet empire brought competition among other powers or influence in the area one of the new countries' first acts was the establishment of the Interstate Commission for Water Coordination, in 1992¹⁰.

Water is a key issue in the region today. Ninety percent of the water resources are concentrated in Kyrgyzstan and Tajikistan, while the main consumers – Uzbekistan and Kazakhstan – can meet only 14 per cent and 45 percent, respectively, of their water needs. Uzbekistan alone consumes more than half the region's water resources. As a result, though, Kyrgyzstan and Tajikistan control the water needed by Uzbekistan and Kazakhstan. The upstream states view water as a commodity for trade and profit, especially since they are poorly endowed with other resources. Control over water is also important for them, as they need it to generate much of their power needs. The existence of border disputes intensified the water problems¹¹.

With independence, the downstream countries have undertaken a policy of energy self-sufficiency and reduced their dependency on imported hydropower from their neighbours. Upstream countries have pursued a policy of developing and utilizing their hydropower potential, which has significantly reduced the water flows to downstream countries. The urban population of upstream countries is to a large extent, dependent on the gas and coal supply from downstream countries, especially during winter. The downstream countries thus want water for cotton and can use their energy supplies to bargain for it; the upstream countries can bargain with their water but their energy strategy requires retaining more of it. Thus, the downstream and upstream countries face different

⁹ Environment and Security- Transforming Risks into Cooperation/<http://www.envsec.org/centasia/index.php>

¹⁰ Alexander Sidorenko, op.cit., pp.61-65

¹¹ David Smith, 'Environmental Security and Shared Water Resources in Post-Soviet Central Asia', *Post Soviet Geography*, Vol. 36, No 9 ,1995, pp.565-586

domestic pressures. Their interests are often diametrically opposed to each other and offer little flexibility in negotiating the terms of joint use of water resources¹².

Given all these factors, it is not surprising that bilateral and multilateral water arrangements are constantly being renegotiated, a factor that only increases the importance, controversy and tension around this resource's distribution.

(ii) Aral Sea Crisis:

The Aral Sea crisis is an example of environment problem with severe social and economic implications. The problem affects the entire region. This disastrous situation, caused by drying up of the Aral Sea, emerged as a result of an agricultural policy based on development of land irrigation and a corresponding increase in water consumption. For its sustenance, the Aral Sea, draws on the glaciers located on its South east in the Tien-Shan mountains and the Pamirs. The rivers that bring the water to the Aral are the 1370-mile long Syr Darya (Jaxartes or Jaihun) and the 1578-mile long Amu Darya (Oxus or Saihum). Before the 1950s, these rivers maintained the amount of water in the lake at 1,075 cubic kilometres and the salinity density of 10 gram per litre. Apart from these two rivers, the lake does not have any other source with which to replenish itself¹³.

Central Asia is a predominantly agrarian society. Its people had drawn on these rivers for the irrigation of their farms for centuries. Using a moderate amount of the waters of the rivers, therefore, has always been a feature of the ecological make-up of the region¹⁴.

Misuse of the rivers began when the Soviets introduced their grand scheme, which was to divert the waters of the Amu to feed the otherwise parched scraps of land on the fringes of the Kara Kum and to build massive irrigation channels on both the Amu and the Syr for the creation of new wheat fields¹⁵. The plan was approved. By 1960, the waters of

¹² Bea Hogan, 'Central Asia States Wrangle over Water', *Eurasia News*, April 2000 at <http://www.eurasianet.org/>

¹³ Central Asia: Environment Assessment/ <http://www.mem.dk/aarhus-conference/issues/nis/assesasia.htm>

¹⁴ Philip P Micklin, 'Water Management in Soviet Central Asia: Problems and Prospects' in JM Stewart (ed.), *The Soviet Environment: Problems, Policies and Politics*, (Cambridge: Cambridge University Press, 1992), pp.88-114

¹⁵ Ibid

Amu reached the city of Ashgabat, making the desert bloom all across its 900 kilometres. From there it headed for the Caspian Sea. The projected canals on both sides of the Syr and Amu also went into operation, turning the parched lands around them into blooming fields of cotton. Large number of people, attracted by the unprecedented harvests of cotton and wheat, left their original homelands and moved to towns like –Merv, Murghab, Charju, and the like¹⁶.

The first sign of substantial shrinking of the lake appeared in 1970s. It was obvious that the sea was not at its normal level. Weather conditions in the Tien Shan and the Pamirs preventing the glaciers from providing the usual amount of water were blamed. No step was taken to remedy the situation. By the 1980s the causes of shrinkages couldn't be hidden and plans to replenish the lake with water from Siberia was only discussed.

In the 1990s, the common man became aware of the lake's plight and soon expeditions were sent to assess the damage. Certain conferences were also held to raise the public's consciousness about the plight, but they did not yield the desired results. Today the shoreline of the Aral Sea has withdraw in some places by more than 100 kilometres, which means that towns such as Muynak (Uzbekistan) and Aralsk (Kazakhstan), which were built with Sea-side projections, are now in the middle of the desert. Due to the continued exportation and the insufficient inflow of river water, the Aral Sea is disappearing and splitting into three different smaller areas¹⁷.

In the late present times, there are many environmental problems in the Aral Sea Basin, some of which are serious in themselves, some of which affect the current state of the Aral Sea, and others that are an indirect spin-off of the drying out of the sea. The implications are as follows:

(a) A growing proportion of irrigated land in Central Asia is now more or less saline. The major cause of this has to be sought in the lack of crop rotation, since in most places; cotton has been a monoculture for many decades. Furthermore, inadequate and

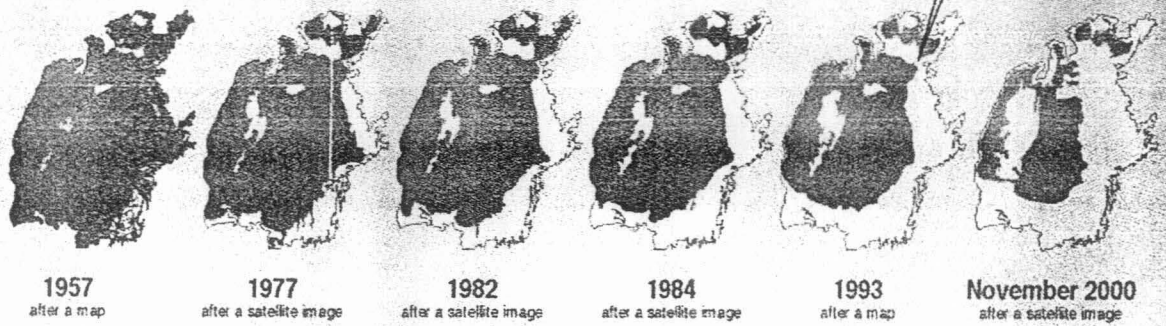
¹⁶ Max Spoor, 'The Aral Sea Basin Crisis: Transition and Environment in Former Soviet Central Asia', *Development and Change*, Vol.29, No.3, July 1998, pp.410-415

¹⁷ Stuart Horsman, 'Water in Central Asia: Regional Cooperation or Conflict?' in Allison, Roy and Jonson, Lena (ed.), *Central Asian Security – The New International Context*, (Washington DC: London & Brookings Institution Press, Royal Institute of International Affairs, 2001), pp.69-86

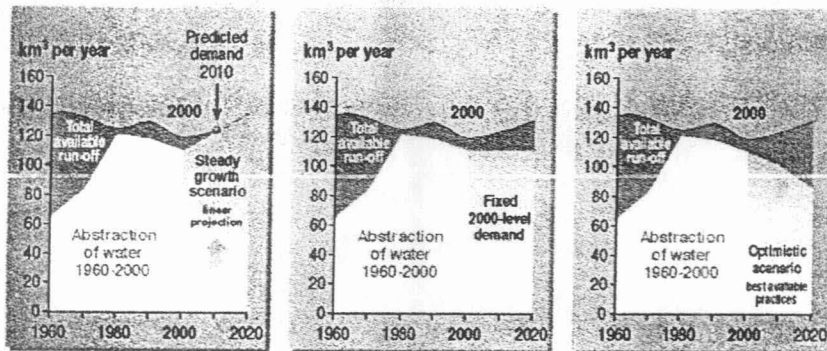
Will There Be Water Left in the Aral Sea Basin ?

Evolution of the Aral Sea over the last 40 Years and Possible Scenarios

What has happened...



What could happen...



PHILIPPE REY ADEWICZ
MARCH 2002

Sources: Nikolai Denisov, GRID-Arendal, Norway Scientific Information Center of International Coordination Water Commission (SIC ICWC) ; International Fund for Saving the Aral Sea (IFAS) ; The World Bank ; National Astronautics and Space Administration (NASA) ; United States Geological Survey (USGS, United Earthshots - Satellite images of environmental change, States Department of the Interior.

SOURCE - <http://www.envsee.org/centasia/maps>

archaic drainage systems cannot handle the serious problems of water logging and the upward flow of minerals. We can thus say that Central Asia has a water crisis as well as problem of salinity. Soil salinity tends to reduce agricultural yields and to increase water consumption, since farmers get into the habit of water reaching to wash the soil, which consumes large quantities of water at the start of the season¹⁸.

Salinity is even more severe in the downstream areas of the basin, since the rivers and drainage wash down salt canals and there is hardly any natural drainage in these relatively flat areas. The upstream countries of Kyrgyzstan and Tajikistan have low rates of salinization, while severe soil salinity is seen in the lower reaches of the Amu Darya, Syr Darya and the Zerafshan rivers¹⁹.

Soil Salinity might seem to be 'merely' a technical problem, yet it has major social and economic consequences. Salinity can negatively affect crop yields and, hence, the income of farm households. It is known that only tolerant plants will grow satisfactorily on soils with moderate salinity. On severely saline soils, only a few highly tolerant plants will flourish. If soil salinity is above a certain threshold value, yield losses can easily range between 10-50 percent²⁰.

(b) The smaller quantities of water that actually flow as far as the deltas of both main rivers and the aforementioned increased water salinity in those areas have had devastating consequences for biodiversity. Part of the rich flora and fauna of these wetlands, which were also the breeding grounds for many birds and fish in the basin system, has disappeared. In the Amu Darya delta, the unique Tugai forests have suffered enormously²¹. Due to environmental change, most of riparian areas of lower Amudarya and Syrdarya are totally dead and more than 80 types of plants and 50 types of animals have been lost forever. Much of the fish population in the Aral Sea itself has died out, with of course dramatic consequences, of course, for the populations of the surrounding towns, which were largely dependent on catching fish. Again, loss of biodiversity is far from

¹⁸ David R Smith, 'Change and Variability in Climate and Ecosystem Decline in Aral Sea Basin Deltas', *Post Soviet Geography*, Vol.35 No.3, March 1994, pp.387-98

¹⁹ Environment Problems in Central Asia/ <http://www.grida.no/enrin/htmls/soe/soee/nav/water/aral.html>

²⁰ <http://www.grida.no/prog/cee/enrin/htmls/soe>

²¹ Central Asia: Aral Sea Problem/ http://www.fpiif.org/briefs/vol5/v5n06aral_body.html

being an abstract issue in that it has had very negative consequences on employments, income generation, and health²².

(c) There is a rapidly expanding area of exposed seabed in the Aral Sea. This is found on the shores as the Sea has shrunk, but also on the land that separates the deep western and shallow eastern sea, which consists largely of salt. With desert storms blowing during approximately three months per year, large quantities of salt are being deposited on surrounding agricultural lands. Because of desertification, windstorms move an increasing amount of salt in Central Asia, especially near the Aral Sea. This “Salt Pollution” not only has a negative impact on agricultural production, but also on human health²³. The number of cases of respiratory disease is relatively high, and it’s referred to in a BBC documentary as a form of “environmental AIDS”²⁴.

(d) The shrinking of the Aral Sea has contributed to climate change in the surrounding areas. The planting season has shortened, the number of frost-free days has decreased, and summer temperatures (in the desert) are slightly higher. Previously, the huge size of the Aral Sea helped to regulate temperatures, and its drying out has had a negative impact on this process²⁵.

(iii) Land Degradation:

No environmental issue in Central Asia enjoys more consensus than that of desertification and related forms of land degradation. Within the republics diverse factors cause and exacerbate desertification and land degradation. They are loss of vegetative cover (caused due to over-grazing, expanding human population and pollution), erosion (both wind and water), depletion of soil resources (from non-rotation of crops), water logging of soils and salinization (from substandard irrigation practices), and the desiccation of the Aral Sea. Consequently, land degradation in Central Asia is a concern equally of settlements at the edge of existing deserts and semi deserts in Turkmenistan, of

²² M Turnbull, *Soviet Environmental Policies and Practices*, (Dartmouth: Aldershot, 1991), pp.33-62

²³ Edith Brown Weiss, ‘Our Rights and Our Obligations to Future Generations’, *84 AJIL*, No.198,199,1990, pp.33-62

²⁴ DP Bedford, ‘Institutional Water Management in the Aral Sea Basin’, *Water International -21*, 1996, pp.63-69

²⁵ David R Smith, op.cit,pp.387-98

agriculturists in Uzbekistan's valleys, and of populations living at high altitudes, in the Tien-Shan and Pamir mountains of the Kyrgyz Republic and Tajikistan²⁶.

Increase of intensive use of lands into plough land particularly irrigated, and also reasons stipulated by socio-economic factors have led to some negative phenomena. Vast arable lands are in unsatisfactory conditions today.

The largest states of Central Asia are already largely deserts; and the remaining states also contain arid and desert areas, but are also mountainous. All the states of the region utilize deserts and semi-deserts extensively for agriculture and animal husbandry, despite the sensitivity of these lands and the expense of reclamation. The arable lands of Central Asia are heavily degraded²⁷.

The transition period has exacerbated these trends. While total numbers of livestock have decreased, thereby allowing some natural restoration, control and regulation of where livestock graze has become lax and contributes to degraded local carrying capacity. As a result, many sensitive areas, especially in mountainous areas, are overgrazed, leading to land degradation. Similarly, the wartime conditions in Tajikistan have forced refugees to new areas. The impoverishment has forced the villagers to cut slow-growing critical plant species like – Saksaul and juniper for fuel, and trade in species like soaproot, for local subsistence and Asian medical markets, and thus clearly explaining the loss of vegetation²⁸. Also the urbanization of territories, building of transport systems, hydro-technical constructions and mining have completely destroyed thousands of top soil.

Felling of mountainous forests and impoverishment of vegetation cover leads to increase of washing of fertile layer of soils, loss of surface moisture, increase of mud-floods and landslides processes, worsening of slope stability and general degradation of surrounding landscapes. While root causes of land degradation in Central Asia are not actively disputed, to date almost no effort has been made to address these root causes, and there is little political will to do so²⁹.

²⁶ M Turnbull, *op.cit.*, pp.33-62

²⁷ Alexander Sidorenko, *op.cit.*, pp.61-65

²⁸ *Ibid*

²⁹ Eric W Sievers, *op.cit.*, pp.36-37

(iv) Mountain Systems Degradation:

The environmental and socio-economic welfare of the economically developed and densely populated areas of Central Asia primarily depends upon the extent to which the “natural balance” can be preserved within the region’s mountainous areas. The mountain systems are being degraded. This has become so significant in many areas that it would be naive to assume that the damage can be naturally reversed and that these ecosystems can self-recover. The most significant indicators are the disappearance of forests, dangerous exogenic processes, the pollution and decrease in pasture productivity, and depletion of water resources, and environmental pollution by neighbouring highly populated plains containing industrial sites. The regulation of tourism upon the mountain ecosystem is another critical issue³⁰.

(v) Air Pollution:

The main air pollution sources within Central Asia are the electric power stations, ferrous and non-ferrous production plants, construction materials production plants, and the municipal sector. Given the industrial decline and subsequent decrease in air emissions from stationary sources, motor transport emissions are increasing motor transport accounts for up to 80 percent of air pollution within the big cities³¹.

(vi) Transboundary Transfer:

The transboundary transfer of pollution within Central Asian region affects weather resources and particularly air resources. Amu Darya, Syr Darya, Zerafshan, and Mailusu river pollution is due to the development of the mining industry, agricultural, and municipal sectors within these river basins. These rivers ultimately flow into the Aral Sea. This aggravates its problems, threatens biological diversity, and affects the socio-economic development of the region as a whole³².

³⁰ Central Asia : Environment Assessment/ <http://www.mem.dk/aarhus-conference/issues/nis/assesasia.html>

³¹ Environment and Security–Transforming Risks into Cooperation/<http://www.envsec.org/centasaia/index.php>

³² Igor Lipovsky, ‘The Deterioration of the Ecological Situation in Central Asia: Causes and Possible Consequences’, *Europe Asia Studies*, Vol.47, No.7, 1995, pp.1109-14

Transboundary pollution, particularly from radioactive wastes, has arisen from numerous dumps left by the previous unsustainable exploitation of natural resources. These pose a serious threat to the environment due to improper and /or complete lack of remedial recovery processes. This problem is typical for all Central Asia. Wastewater is the main cause of transboundary river pollution and the high incidence of gastro-intestinal diseases amongst the river basin's inhabitants³³.

(vii) Biodiversity:

Central Asia boasts of considerable biological diversity, which includes more than 7000 flowering species of plants. It has nearly a thousand species of vertebrates, which include more than a hundred reptile species. Notable species include – snow leopard, Caspian seal, Karatan argali, Severtsov urial, MacQueen's bustard, and bearded vulture. Ship sturgeon, Menzbir's groundhog, and striped hyena complementing these species are numerous rare and endangered ecosystems, such as feather grass steppes, walnut and pistachio forests, and high attitude lakes³⁴.

Large tracts of forests are of great importance for the global oxygen and carbon circulation. Their quantity influences greatly the radiation balance, the atmosphere circulation and the quality of air, the water regime and the land. The forests in different Central Asian States are unevenly located. The greatest area covered with forests and with stock of wood is located in Kazakhstan which is 54.7 percent and minimum in Tajikistan, where it is just 2.4 percent.

Central Asia is substantially more bio diverse than its neighbours to the north and west. This wealth of biodiversity and its continued existence are important for both global reasons (as sinks and as the common heritage and concern of humanity) and local reasons (as an indicator of the health of human environment, as a source of tourism revenue, and as local heritage). While the region now possesses only limited capacity to reverse or mitigate its other environmental problems, it boasts established mechanisms to protect biodiversity. Central Asia contains a developed network of nature reserves inherited from the Soviet

³³ Central Asia an Overview/ [http:// www.angelfire.com/rnb/bashiri/Centasia/Centasia.html](http://www.angelfire.com/rnb/bashiri/Centasia/Centasia.html)

³⁴ Eric W Sievers, op.cit., pp.38-39

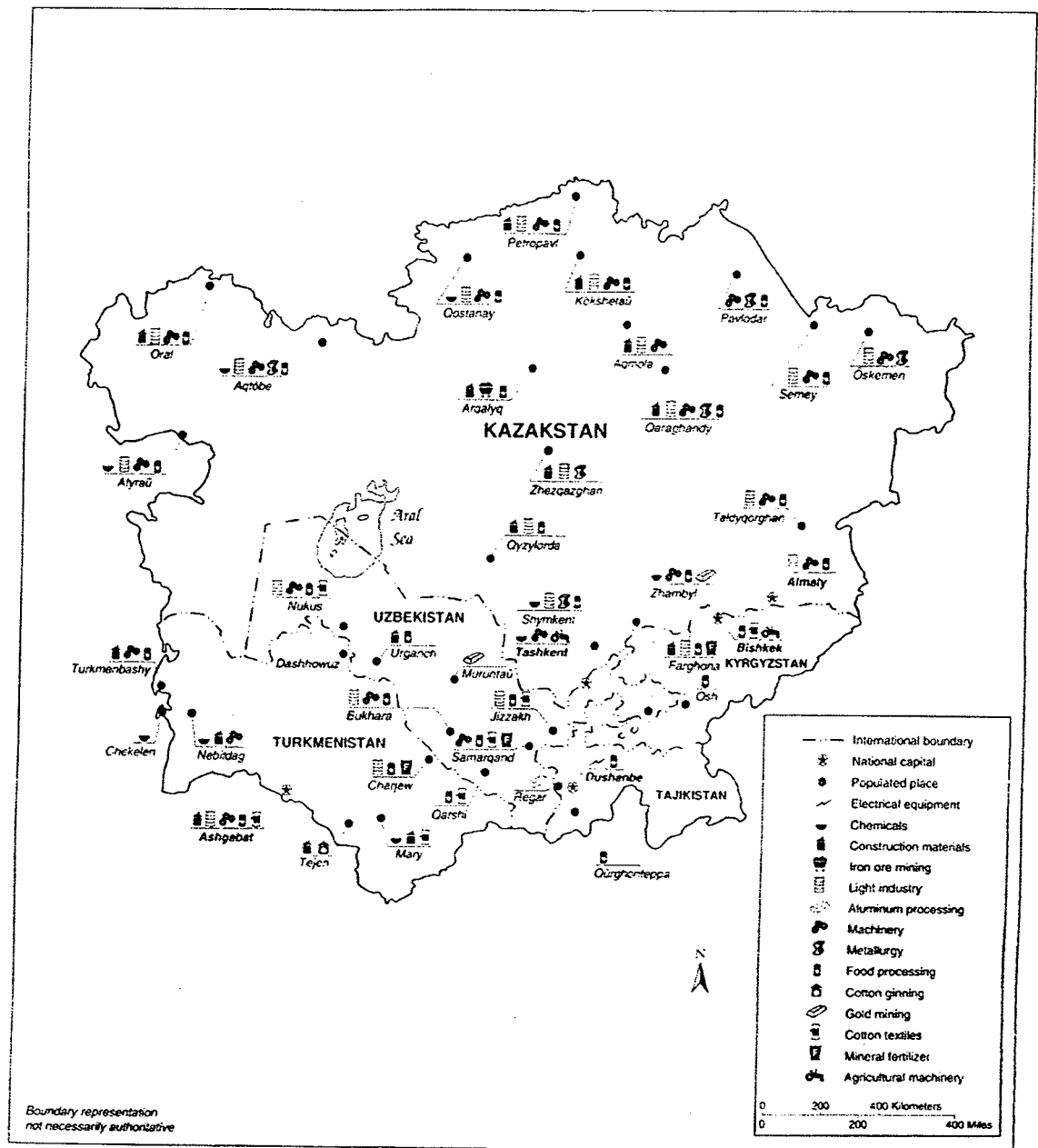


Figure 1. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan: Industrial Activity, 1996

SOURCE - <http://www.envsec.org/centasia/maps>

Union³⁵. Roughly 3 percent of the region existed as conservation land in the late Soviet era. Today only 2.5 percent of Central Asia is in some sort of conservation regime. But the fate of these reserves is unclear, as after independence, these reserves were highly misused.

(viii) Industrial Pollution:

Energy and Water are comparable components of Central Asian life. The massively inefficient irrigation practices of Central Asia match massively inefficient patterns of energy use. While hydropower and natural gas meet an appreciable amount of the region's energy needs, reliance on coal and inefficient power plants drives levels of tons of carbon emission per unit GDP to extraordinary levels³⁶.

Because Central Asia is already heavily degraded environmentally and since much of the region is situated in environmentally sensitive territories, the link between economic activities and environmental sustainability is accumulated. The sensitive ecosystems of the area are for the reasons stated above less able to absorb and mitigate pollution than are ecosystems in other areas of heavy industrial development, and this situation elevates the marginal environmental and health costs of industrial activities and development in the region³⁷.

(ix) Caspian Sea:

The Caspian Sea, covering more than 370,000 square kilometres, is by far, the planet's largest inland body of water. Its littoral states are Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan, meaning that half of the states of Central Asia have a direct interest in the sea³⁸.

³⁵ Ibid

³⁶ Nicola Steen (ed.) 'Sustainable Development and the Energy Industries', *The Royal Institute of International Affairs – Energy and Environment Programme*, (London: Earthscan Publication Ltd., 1994), pp.25-33

³⁷ Eric W Sievers, op.cit., pp.38-39

³⁸ A Caspian Gamble / http://www.economist.com/surveys/displaystory.cfm?story_id=112313

This interest extends to communities living near the sea, as well as to the sea's traditional provision of appreciable income from caviars exports and the sea's potential status as a major source of hydrocarbons³⁹.

Moreover, the Caspian is already afflicted by massive amounts of pollution, primarily brought into the sea from more than 10 rivers than feed into it, as well as by oil refining operations on the coasts in Azerbaijan, Kazakhstan. Partly, due to this pollution, the Caspian's annual yield of Sturgeon has plummeted from tens of thousands of tons per year to less than ten thousand tons. In recent decades another major environmental issue involving the Caspian has been the rising level of the sea⁴⁰.

(x) Hydrocarbons and Mining:

The Central Asian states have been approving mining and hydrocarbon projects without legally appropriate environmental impact statements or liability guarantees. Several harmful accidents have occurred from time to time, but no one to take up the responsibility. Today hydrocarbon development is emerging as a potential source of massive transboundary and regional environmental damage.

Moreover, without adequate environmental impact statements, it is hard to gauge the extent to which extractive enterprises are polluting the environment in Central Asia with the kind of dangerous and persistent radioactive and hydrocarbon by products that gold mining and hydrocarbon extraction produce⁴¹.

Steps Taken By the Central Asian States in Addressing the Environmental Issues

After going through the following problems we can say that the Central Asian states have a long way to go before they come to terms with the current environmental challenges. We shall now briefly examine the necessary steps that have been taken in Central Asia to tackle the environmental issues.

³⁹ Ibid

⁴⁰ US Energy Information Administration (EIA), '*Caspian Sea Region: Environmental Issues*' 2000, <http://www.eia.doc.gov/emen/cabs/caspenv.html>

⁴¹ Eric W Sievers, op.cit., pp.43-44

(i) Only international funding is at the heart of all the major military clean-up efforts in Central Asia, despite the scale and importance of these problems, no state in the region has independently assumed responsibility for addressing these problems⁴².

(ii) A large number of bilateral agreements have been signed to manage water issues in Central Asia, between 1997 and 2004. Kyrgyzstan and Uzbekistan alone signed ten agreements and held a large number of meetings. Despite the signing of many water agreements, however, the results have been unstable. Countries have broken their commitments at times when their leverage was greater and they thus believed they could obtain a better deal. Leaders are under constant domestic pressure – especially from farmers – to improve the terms of these arrangements⁴³.

The conflict of interest over water resources between the upstream and the downstream states is now addressed in an ad hoc manner, through annual bilateral negotiations involving compensations of the upstream states, in the form of coal, natural gas or electricity supplies by the downstream states. However, the implementation of these bilateral agreements is difficult, if not impossible.

(iii) Several new national and regional organisations appeared during the first decade of transition, in order to fill the institutional vacuum, which existed after 1991, to find solutions to the Aral Sea problems.

In February 1992, soon after the independence of the five Central Asian states, a joint agreement was reached establishing an Interstate Commission for Water Coordination, which became responsible for the water allocation for the five former Soviet states in the Aral Sea basin. Even so, there were still substantial weaknesses in the agreement. A subsequent agreement was signed in March 1993, establishing regional organisations such as the Interstate Council on the Aral Sea (ICAS) an advisory body for the five regional governments. Which had an Executive Committee and a Secretariat An International Fund for the Aral Sea (IFAS) was also established to finance the activities of ICAS, and in 1994, a Sustainable Development Commission (SDC) was formed, which

⁴² Daphne Billouri, 'Environmental Issues in Central Asia: Bridging the Gap between Rhetoric and Action', *Eurasian Studies*, Vol.19, Spring –Summer 2001, pp.19-21.

⁴³ Ibid.

focused on environmental protection and socio-economic development a few years later, ICAS and IFAs were merged to form a new IFAS, supported by a high – level board of deputy Prime Ministers⁴⁴.

The water management of the two main rivers at basin level is undertaken by two Water Basin Associations (BVOs- the Amu Darya BVOs and the Syr Darya (BVO). These organisations, which had existed since the 1980s, were given the complex task of managing the same water resources in a basin that was now covered by five newly independent countries. Apart from the complex and differentiated jurisdiction of the BVOs, their main problem is that agreements do not have the status of international law, and that they themselves are not even recognized by national legislatures, which means that they lack authority over the national use of resources. Shortage of funding has also hampered their operational capacity⁴⁵.

(iv) The five states are actively interested in mitigation of the effects on the land of cotton and other agriculture; they balk at the idea of more serious reforms and more substantive revisions of their economic foundations. They also remain committed to untenable practices (such as the overgrazing that is connected to the livestock industry or the population expansion connected with policies that encourage high birth rates) despite the medium and long-term erosion of natural capital that results from such practices⁴⁶. Efforts have been made to reduce the cattle stock up to optimum level, with control of cattle number. Fixed zones free of cattle breeding and rotatory pastures have also been introduced. They are also trying to maintain a positive humus balance in the soil at the expense of introduction of alternation of crops and application of organic fertilizers.

(v) The states in the region and their activist communities of conservation and research biologists are trying their best to protect the biodiversity of the region. But current efforts to protect biodiversity in Central Asia have two major failings due to the over use of reserves as proxies for preservation. Firstly, a comparatively minor effort is directed towards general enforcement of the region's adequate laws on wildlife protection: legal

⁴⁴ Max Spoor, and Anatoly Krutov, 'The Power of Water in a Divided Central Asia' in Mehdi Parvizi Aminen & Houweling Henk (ed.), *Central Eurasia in Global Politics: Conflict, Security & Development*, (Netherlands: Koninklijke Brill. NV, 2004), pp.279-300.

⁴⁵ Nurushev, 'Crisis of the Aral Sea', *Himalayan and Central Asian Studies*, Vol.3, No.2, April- June 1999, pp.50-58

⁴⁶ Philip P Micklin, *op.cit*, pp.88-114.

efforts are limited to drafting new laws instead of enforcing existing laws. Secondly, local communities are often very hostile to the assignment of lands to conservation regimes. The consequences are that Central Asia's stocks of important biodiversity are on the decline and conditions for recovery are diminishing⁴⁷.

(vi) Central Asia currently possesses, even after post-Soviet collapses, an unusually high level of industrial infrastructure. This infrastructure is, per unit output, far more environmentally devastating than is the global norm. As a result, even a slashing of industrial output in Central Asia of the type that has occurred since 1991 has not been able to effect a reversal of trends in industrial pollution⁴⁸.

Role of Non Governmental Organizations (NGOs)

Following the Soviet Union's collapse, the newly independent Central Asian states – Kazakhstan Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – had to confront a broad array of ecological problems, which have been mentioned earlier. Although over a decade has passed since the break-up of the Soviet Union, the Central Asian States are still discovering the magnitude of their ecological situation, largely because many problems were hidden from the average Soviet citizens.

Finding effective solutions to the environmental and health crisis in Central Asia is especially difficult because the Central Asian states are economically weak. The governments lack the administrative capacity and financial resources even to carry out basic tracking and cataloguing of their environmental problems. Besides the necessary monitoring of environmental problems, the Central Asian governments need to promulgate environmental regulations, negotiate regional environmental treaties, and then implement them. Appropriate solutions require substantial financial and technical resources. The collapse of the Soviet economy and the subsequent decline in economic growth has however, hampered the Central Asian States' ability do respond to their pressing environmental problems⁴⁹.

⁴⁷ Eric W Sievers, op.cit, pp.43-44

⁴⁸ Zainidin Karev, op.cit, pp.2-6

⁴⁹ Erika Weinthal, 'Beyond the State Transnational Actors, NGO's and Environmental Protection in Central Asia', in Pauline Jones Luong (ed.), *The Transformation of Central Asia: States and Societies from Soviet Rule to Independence*, (New Delhi: Manas Publications, 2005), pp.246-270

The lack of state capacity is one of the main constraints hindering environmental protection in Central Asia. State capacity is defined as the ability to implement policies in order to achieve economic, social or political goals. It also includes technical, fiscal and organisational dimensions. The ability of the Central Asian governments to carry out domestic and regional policies for environmental protection is contingent upon creating new domestic institutions as well as horizontal linkages among the organizations and their staffs. Yet such horizontal linkages were absent during the Soviet period, and decisions were transmitted vertically downward from Moscow. The newly empowered environmental organisations will require substantial financial resources to carry out their tasks and update their infrastructure and equipment. In response to the overall challenge of building state capacity for environmental protection, the Central Asian governments have turned to various transnational actors, particularly international governmental organizations and international nongovernmental organizations (NGOs)⁵⁰ to assist them. The Aral Sea Basin Program and Caspian Environment Program – have been carried out in conjunction with international donors like the World Bank and Global Environment Facility. These transnational actors have, infact, had the greatest effect on promoting environmental protection in Central Asia through their support for local NGOs⁵¹.

One of the main functions of the modern nation-state is the provision of public goods such as education, health care, and a clean environment in exchange for taxation, but it seems that the Central Asian States have not acquired the institutional capacity to implement policies for environmental protection. Taking into account that different states have different capacities to formulate and carryout social policies such as environmental protection it appears that the newly independent Central Asian states resemble developing countries that lack the institutional capacity to carry out environmental protection, especially in light of the loss of subsidies from Moscow. Insofar as states are embedded within societies, the stronger the ties to society the more likely it is that the state can carry out its goals; where the state is autonomous or disconnected from society, it is less likely to be able to implement its goals. Like states, societies are not homogenous units but the composed of different social forces. One important component of society is its NGOs. The

⁵⁰ Different sources refer to these groups with different names, such as – NGOs, Civil Society Organization (CSOs), Private Voluntary Organizations (PVOs), Charities, Third Sector Organization, www.NGOWatch.org.

⁵¹ Erika Weinthal, *op.cit*, pp.246-270

role of NGOs and their relationship to both state and other societal actors provides proper insight into a state's capacity to provide public goods such as environmental protection⁵².

The World Bank defines NGOs as “private organizations what pursue activities to relieve suffering, promote the interests of the poor, protect the environmental provide basic social services, or under take community development”⁵³.

In wider usage, the term NGO can be applied to any non-profit organization, which is independent from government. NGOs are typically value – based organizations, which depend, in whole or in part, on charitable donations and voluntary service. The principles of altruism and voluntarism are its key defining characteristics⁵⁴.

These groups can encompass a wide variety of groups, ranging from corporate – funded think tanks, to community groups, grassroots activist groups, development and research organizations, advocacy group, operational, emergency/humanitarian relief focused, and so on.

The following are a few reasons, which reveal why NGOs have become increasingly important in the past decade or so.

- (i) The end of the Cold War made it easier for NGOs to operate.
- (ii) Communications advances, especially the Internet, have helped create new global communities and bonds between like minded people across state boundaries,
- (iii) Increased resources, growing professionalism and more employment opportunities in NGOs.
- (iv) The media's ability to inform more people about global problems leads to increased awareness where the public may demand that their governments take action of some kind⁵⁵.

⁵² Ibid

⁵³ <http://www.NGOWatch.org>

⁵⁴ Ibid.

⁵⁵ David Lewis, and Tina Wallace (ed.), *New Roles and Relevance: Development NGOs and the Challenges of Change*, (Kumarian Press, 2000), pp.20-25

In the present times, states will go far so as to incorporate NGOs into the environmental policy and implementation process because NGO participation benefits states, especially because NGOs can provide information and carry out research concerning different policy options. NGOs can enhance state capacity by translating environmental concerns into policies. They can help governments that lack organizations and financial capacity by monitoring whether environmental policies are being implemented. They enhance state capacity for environmental protection by defining the environmental agenda, dispensing financial and material resources, diffusing norms and notions of accepted patterns of environmental protections and rendering support to local NGOs.

The activities of NGOs have expanded in the aftermath of the cold war, they have intervened in the internal politics of post-communist states to help them undergo political and economic transitions and, hence, to help them build states. They are, moreover, at the forefront of efforts to help the Central Asian states rectify decades of environmental mismanagement. For example: In Kazakhstan, environmental activism: the Nevada – Semipalatinsk movement – succeeded in halting nuclear weapons testing. In Uzbekistan, the Committee for Saving the Aral Sea along with other eco-nationalist movements inspired a campaign that demanded that Moscow lessen the burden on the Central Asian states as the main producers of cotton. At the time of the Soviet Union and after the collapse there already existed a nascent environmental movement in Central Asia⁵⁶.

As a result, at independence the international community perceived the Aral Sea crisis as ripe for international intervention because of the local and international awareness of the severity of the its environmental degradation. On account of the United Nations Environmental Program (UNEP) diagnostic study that was undertaken in 1990, the desiccation of the Aral Sea was the most widely known environmental problem in Central Asia. As the international donor community began to aid the new state economies that are in transition, environmental protection became one part of the donor assistance programs. Because of both domestic and international interest in resolving the Aral Sea crisis, the Central Asian governments developed with the World Bank, the United Nations Development Program (UNDP), and the UNEP a multilateral and program- the Aral Sea

⁵⁶ Erika Weinthal, op.cit, pp.246-270

Basin Programme to mitigate the environmental and health consequences in the Aral region, restructure the system of water management and foster regional cooperation.

Regarding the environment generally and the Aral Sea specifically, international organisations spread norms concerning what institutions are necessary for environmental protection and what strategies environmental actors should follow. Through connecting the Central Asian states to a global environmental culture, transnational actors have constructed isomorphic, or similar, environmental structures across the Central Asian States⁵⁷. Particularly, the influence of global environmental norms has led to a convergence in environmental policy whereby the Central Asian states have created new environmental institutions, taken part in international environmental organisations, promulgated new environmental laws, and signed on to global environmental accords as part of state making. The newly independent Central Asian states have learned quickly that in order to attract international environmental assistance and join the international community of nation-state. They needed to adopt international environmental practices⁵⁸.

As part of the broader process of joining this global environmental culture, one of the first steps taken by the newly independent Central Asian States was to reconstitute their environmental ministries and departments. Since, only states have the authority to sign international environmental agreements⁵⁹, it has become essential for governments to create environmental agencies in order to assume this role. By signing international environmental agreements, states moreover, become eligible for international environmental assistance, which is provided for capacity building programs so that states can meet their international environmental commitments. We can say what the Central Asian, States, like other developing countries, are responsive to a world culture in which states have become “environmentalized”⁶⁰.

In short, transnational actors and NGOs have played a critical role in helping the Central Asian states formulate policies for environmental protection and in providing assistance for capacity building programs so that they can implement environmental

⁵⁷ MH Nuri, ‘The Caspian Sea Region Problems and Prognostications’, *Eurasian Studies*, Vol.19, Spring-Summer, 2001, p.6

⁵⁸ Erika Weinthal, *op.cit*, pp.246-270

⁵⁹ Igor Lipovsky, *op.cit*, pp.1109-1120

⁶⁰ Erika Weinthal, *op.cit*, pp.246-270

programs related to climate change, sustainable development, and water sharing, among others. Yet, institution building and such aid programs are only the initial step in building capacity to help the Central Asian states protect their environment⁶¹.

The dramatic growth in the number of local and international NGOs is indicative of the upsurge in transnational activity throughout the world. In response to the growing significance of NGOs in global environmental politics, the donor community has taken concrete steps to encourage their development in Central Asia, yet the new NGO community has had to deal with the Soviet legacy which lacked civil society. Prior to glasnost, Moscow had suppressed most forms of individual activism, except for a few instances in which groups focused on conservation issues. Since the Soviet Union's collapse a variety of Western NGOs (ISAR, HIVOS, NOVIB, INTRAC)⁶² have actively supported the development of environmental NGOs in Central Asia. The money from these transnational actors has enabled local NGOs to raise public awareness regarding environmental problems and to put new issues on national and international agendas a large share of local NGO activity has focused on information collection and dissemination⁶³.

But the mere process of building institutions is not sufficient for strengthening state capacity; rather, the ability of the Central Asian states to deal with their environmental problems has hinged upon the relationship between societal actors and transnational actors. NGO participation is considered vital for implementing environmental protection goals in Central Asia because local NGOs, possess a wealth of information about the local health and environmental situation, and, more importantly, their participation is necessary to carry out any program concerning education, sanitation, clean drinking water and basic hygiene at local level.

The development of state institutions for environmental protection in Central Asia is not situated solely within society, but rather it is a function of the internationalization of the Central Asian environment. Transnational actors have been instrumental in constituting

⁶¹ Sumit Roy, 'Sustainable Development: The Role of International Institutions and NGOs', *World Affairs*, Vol.4, No.2, April-June 2000, pp.90-99

⁶² They are – Initiative for Social Action and Renewal in Eurasia, Humanist Institute for Cooperation with Developing Countries, NOVIB is a Dutch development NGO, International NGO Training & Research Centre.

⁶³ Sumit Roy, op.cit, pp.90-99

new environmental institutions, policies, and legislation in Central Asia. They have enhanced environmental protection through their support of societal forces such as local NGOs⁶⁴.

In general, the rise of Central Asian NGOs symbolizes the inchoate nature of Central Asian State capacity for environmental protection. As has been the case in other developing countries, the Central Asian governments have ceded non-political responsibility on NGOs and they still have a long role to play.

⁶⁴ Ibid

CHAPTER IV

REGIONAL COOPERATION AND SUSTAINABLE DEVELOPMENT

In today's world, human pressures on natural resources are increasing, while many resource bases are deteriorating or being depleted, creating an increased potential for competition and conflict between nations or groups within societies. In the case of Central Asian States, their resource structure is highly interwoven, thus leading to high intensity of regional interdependence. Regional cooperation among the five states and also international cooperation is very essential for the states' future progress¹.

A Move towards Regional Cooperation and International Coordination

Today the Central Asian Republics have explicit connections with international environmental regimes, which indicate that the region is moving towards sustainable development. So we now examine the progress which has been attained in this region through the regional and international coordination.

A. Agenda 21, Opening States, and the New Era of Sustainable Development

In an international sphere where state coordination is critical and information limited, the first step towards resolving most issues is to initiate dialogue. For those interested in bringing the states of the world together to work in concert to avert global environmental collapse and to pioneer and implement new strategies of sustainable development². Chances to initiate, develop, and expand dialogue have always contained elemental importance. The role of dialogue, or negotiation, is to share information and build the awareness needed to develop consensus about the gravity of an issue, to marshal the resources needed to develop, data needed for a full analysis of the issue, and to foster the cooperation and integrated understandings needed to address an issue. Such efforts

¹ Lester Brown, 'The Future of Growth', *State of the World*, (World Watch Institute:1998),pp.3-20

² M Schroder, 'Sustainable Development a Principle for Action and an Instrument to Secure the Conditions for Survival for Future Generations?', *Law and State*, Vol.51,1999,pp.101-13.

that focus primarily on dialogue and cooperation, instead of primarily on changing specific practices, are called “soft law”³.

Yet, clear “environmental laws” are infrequent in environmental regimes. There is no equivalent “law” requiring states to prevent loss of biodiversity prevent desertification, or refrain from pollution of international waterways. Rather, a set of less dramatic obligations and of more negotiated character is imposed on the states. Often these obligations consist of little more than filing reports with secretariats, participating in activities intended over time to yield legal statements. Conducting inventories, paying membership dues, and refraining from the pursuit of activities that would flagrantly undermine the goals of the eponymous convention. Occasionally such agreements also anticipate binding arbitration between states in cases of disputes⁴.

It is a fair description that international efforts for environmental protection contain not only directed efforts to build environmental law, but also efforts to use legal machinery to achieve dialogue, awareness, and cooperation, and then to label the outcomes of such efforts “law”. But the 1992 Earth Summit, like the 1972 Stockholm Convention, focused world attention on environmental issues⁵.

The 1972 Report of the United Nations Conference on the Human Environmental (the Stockholm Declaration) and the 1992 Agenda 21, which was the primary document resulting from the Earth Summit, are nothing less than textbooks on global environmental problems and possible solutions, but they are simultaneously at the core of international law. Agenda 21 offers itself as a blue print for the future, ground its authority in its authorship by diverse environmental and legal experts, and essay to make its contents a fundamental text of modern human society. The participation of the Central Asian states in the Agenda 21 regime illustrated the degree to which the region fails to capitalize on the external opportunities open to it⁶.

³ Eric W Sievers, *Post Soviet Decline of Central Asia – Sustainable Development and Comprehensive Capital*, (London: Routledge Curzon, 2003), pp.130-150.

⁴ Lester Brown, *op.cit.*, pp.3-20

⁵ Patricia W Birnie and Alan E Boyle, *International Law and The Environment*, (Oxford: Clarendon, Press, 1994), pp.56-78

⁶ World Agenda: The UN Plan for Community/http://www.crossroad.to/text/articles/Ia21_198.html.

Two main avenues for Agenda 21 participation exist: submission of national report and attendance at Agenda 21 meetings at United Nations Headquarters national reports on sustainable development are arguably the only requirement of Agenda 21 signatories, and at that they are technically only recommended. Yet, because the commission on sustainable development has decided to publish these reports and otherwise draw attention to them as the central component of Agenda 21 implementation, they are as close to a requirement of regime participation as exists. No Central Asian State, with the partial exception of Uzbekistan, has taken advantage of the opportunities accorded by this reporting system, and no state has invested any effort to engage meaningfully in the actual meetings of the Commission on Sustainable Development⁷.

The basic reports should have been submitted before 1997, at which point states began to submit Rio+5 reports. Only Uzbekistan submitted a basic report that could be considered adequate: but even though it provided basic information it failed to use the report as an opportunity to argue for its needs or exhibit its strengths.

Fortunately, the national aspects of Agenda 21 in Central Asia paint a more hopeful picture. While there has been almost no effort to create Agenda 21 commitments at the municipal level, but there is an environmental legal consensus and borrows, at least at a general level, on Agenda 21⁸.

In one sphere the Central Asian States deserve recognition for the degree to which Agenda 21 has become part of the core awareness of both the environmental community and environmental education curricula. Undoubtedly the most impressive aspect of Agenda 21 impact on the Central Asian states has been on, the general consensus and mood of cooperation among NGOs, experienced activists dedicated teachers, and efforts made by the ministries of education to expand environmental education and incorporate Agenda 21 into all curricula. The only drawback was the lack of resources in post-Soviet era⁹.

⁷ Eric W Sievers, *op.cit*, pp.130-150.

⁸ UNCED: 1992 Agenda 21, United Nations Conference on Environment and Development, New York.
<http://www.unced/agenda21/un>.

⁹ Patricia W Birnie and Alan E Boyle, *op.cit*, pp.56-78

B. United Nations Economic Commission for Europe (UNECE)

Established in 1947 by United Nations, UNECE is a forum where fifty-five countries of North America, Western, Central and Eastern Europe, Caucasus and Central Asia come together to forge the tools of their economic cooperation. Over 70 international professional organisations and other non-governmental organisations, which have consultative status with the Economic and Social Council, take part in UNECE activities. The main areas of activity of UNECE are economic analysis, environment and human settlements, statistics, sustainable energy, trade, industry and enterprise development, timber and transport.

UNECE's Multi-Prolonged Approach towards Safeguarding the Environment

The broad aim of UNECE's environment activities is to safeguard the environment and human health and to promote sustainable development in its member states in line with Agenda 21. The practical aim is to reduce pollution so as to minimize environmental damage and avoid compromising environmental conditions for future generations¹⁰.

To this end, UNECE has adopted a multi-prolonged approach and the Central Asian States are fully involved in its working process.

- Its committee on Environmental Policy brings together governments to formulate environmental policy, develop international environmental law and support international initiatives. It organizes seminars, workshops and advisory missions. The committee has negotiated five environmental treaties, all of which are now in force. Their governing bodies are serviced by the UNECE Secretariat, which also helps them to monitor the implementation of the treaties, which include:

- a) The Convention on Long-range Transboundary Air Pollution signed in 1979 and entered into force in 1993.*
- b) The Convention on Environmental Impact Assessment in a Transboundary context signed in 1991 and entered into force in 1997.*

¹⁰ The Environment for Europe Process/<http://www.unece.org/env/wgso/html>

- c) *The Convention on the Protection and Use of Transboundary Water Courses and International Lakes signed in 1992 and entered into force in 1996.*
- d) *The Convention on the Transboundary Effects of Industrial Accidents signed in 1992 and entered into force in 2000.*
- e) *The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental matters, signed at the “Environment for Europe” ministerial conference in June 1998 at Aarhus (Denmark) and entered into force in 2001.*

- The Committee on Environmental policy also takes a very active role in certain regional and cross-sectoral processes, such as “Environment for Europe” and “Transport, Health and Environment”.
- UNECE provides the secretariat for the Ministerial Conferences “Environment for Europe” and their preparatory processes, including, in particular, meetings of the intergovernmental working Group of Senior Officials and its Executive Committee¹¹.
- Finally, through its Environmental Performance Reviews, the Committee assesses individual countries’ efforts to bring down pollution levels and manage their natural resources, and makes recommendations to improve their environmental performance.

The UNECE pursues its goals through policy analysis, the development of conventions, regulations and standards, and through the provisions of technical assistance¹².

C. National Environmental Action Plan (NEAP)

World Bank, UNDP, and TACIS fund a variety of efforts in every Central Asian Republic to create national and regional environmental actions plans for general environmental protection and for specific environmental problems. An ubiquitous aspect

¹¹The Environment of Europe Process/ <http://www.unece.org/env/wgso/html>

¹² Environment and Security – Transforming Risks into Cooperation/
<http://www.envsec.org/Centasia/Centasia/index.php>

of this funding is the creation of a special and very well furnished office for the National Environmental Action Plan (NEAP), a kind of office that stands in stark contrast to anything that the Central Asian states could support on their own for their environmental state agencies. Kazakhstan's NEAP began in 1995, Kyrgyzstan's in 1994, Turkmenistan's in 1996, and Uzbekistan's in 1997. As an offshoot emblematic of manifestations in other republics, in, Turkmenistan formed a National Commission for the Implementation of United Nations Environmental Conventions and Programmes as well¹³.

UNDP has been the most active in the NEAP process. NEAPs are best understood as part of UNDP's agenda within the region. But no NEAP has yet been meaningfully implemented anywhere in the region. The most interesting aspect of NEAPs is not their 1999 tendency to divert attention away from local problems and non-standard approaches or their alienation of those environmental agencies that do not directly receive their exuberant funding. Rather, the most interesting aspects of NEAPs are that they are plan-based (as opposed to market based, reaction based, or action-based), avowedly hierarchical, and beholden to the idea that foreign subsidies will enable implementation¹⁴.

D. Global Environment Facility (GEF)

The Global Environment Facility was created in 1991, and by mid-1999 had received \$2.4 billion in contributions from donor states¹⁵, with the United States the only developed state that failed to contribute its pledged contribution. GEF is the only donor in Central Asia that concentrates its funding attention exclusively on projects of a global nature, especially those issues that are linked with the environment.

E. Biodiversity

While the Central Asia Transboundary Biodiversity Project (CATBP) is the only project in 1999 which received approval for full GEF funding; CATBP is a bell whether for biodiversity projects in the region because of its explicit connection to other GEF

¹³ Eric W Sievers, *op.cit*, pp.130-150.

¹⁴ *Ibid*

¹⁵ <http://www.Ecostan.org/env/>

biodiversity projects such as NEAPs and enabling activities and other UNDP environmental activities (i.e. Agenda 21 implementation)¹⁶.

The purpose of the project is to support the protection of vulnerable and unique biological communities within the western Tien-Shan Range, which hosts 170 endemic species, and to assist the three countries to strengthen and co-ordinate national policies, regulations and institutional arrangements for biodiversity protection. Moreover, Tajikistan was excluded from this project, which involves only Kazakhstan, Kyrgyzstan, and Uzbekistan. Nominally, World Bank consultants excluded Tajikistan because it had not ratified Convention on Biodiversity¹⁷. They included Kyrgyzstan, despite the fact that it, too, was not a CBD signatory, and they successfully, encouraged Kyrgyzstan to ratify CBD in 1996¹⁸.

It also happens to be the best example of transboundary biodiversity protection in the region since it actively embraces the goal of creating habitat corridors between four roughly adjacent nature reserves: AKSU- DZHABAGLY (Kazakhstan), BESH-ARAL and SARY-CHELEK (Kyrgyzstan), and CHATKAL (Uzbekistan). Coming years will test the important questions of how well the three participating states can cooperate, whether expectations for economic benefits will be realized, and whether this project will indeed have positive spill over effects on government practices and programs¹⁹.

But currently, the bio-diversity protection in Central Asia is not up to the mark. In thousands of pages of report and project updates, no donor has yet to claim any tangible progress in preserving biodiversity in the region. Rather, the outcomes of expensive projects are typically documents. This unmitigated lack of substantive progress contrasts sharply with the mixed record of Soviet success in protecting biodiversity²⁰.

Another society working for biodiversity is the German Society for Nature Conservation (Naturschutzbundj Denkschland – NABU) is active in Kazakhstan, Kyrgyzstan and Uzbekistan. In each state, it endeavours to create a Biosphere Reserve out

¹⁶ In Search of Knowledge and Resources: Who Sows? Who Reaps?/ <http://www.biodiv.org>

¹⁷ Centre for Security Studies and Conflict Research of the Swiss Federal Institute of Technology, Zurich/<http://www.fs.ethz.ch/encop.html>

¹⁸ Symposium: Biodiversity, Opportunities and Obligations/ <http://www.biodiv.org/html>.

¹⁹ Eric W Sievers, *op.cit*, pp.130-150.

²⁰ *Ibid*

of an existing one and strengthen protection through additional listing of the area as a world Heritage site²¹. These are TENGIZ – KURGALZHIN in Kazakhstan, ISSYK-KUL in Kyrgyzstan, and NURATAK – KYZYLKUM in Uzbekistan. Thus, NABU is the only foreign organization in the entire region that, independent of any GEF funds has from the start approached Central Asian environmental issues from the standpoint of internationalization of the environment. Moreover, NABU is the only large foreign environmental protection organization in Central Asia that meets the faded definition of a non-profit or civil society organization: NABU is largely volunteer, grassroots and effective. NABU staff lives on the ground with their local partners, accepting the general living conditions of these partners²².

Moreover, since NABU concentrates its efforts in the rural areas in which its projects are situated, it has little interaction with other organizations in the region. Yet, it is on the verge of joining the mainstream of environmental development in Central Asia in near future through its successful bid for GEF funds.

F. The Transboundary Atmosphere

Without any doubts, we can say that the efforts by the Central Asian states to reduce their production and use of ozone depleting substances stand out as the most complete and successful contribution of the region to global environmental cooperation. However, in this, Central Asia merely matches the global norms; meaning the industrial economies of ozone depleting substances has proven to be easier than expected. The region's progress towards phasing out ozone depleting substances has been financed by GEF²³.

G. Desertification

From the previous examples it has been seen that the Central Asian states have always been interested in addressing their problems with desertification, themselves.

²¹ Biosphere reserves, like World Heritage Sites, exist under the aegis of UNESCO. These reserves are intended simultaneously to further conservation, development and research. <http://www.unesco.org/>

²² Eric W Sievers, *op.cit.*, pp.130-150.

²³ S J Toktomyshev and Vladimir K Semyonov, 'Ozone Hole Above Central Asia', *Himalayan and Central Asian Studies*, Vol 2, No.3-4, July-December 1998, pp.123-137

Should desertification and degradation problems become exacerbated within the region, they could lead to an environmental refugees' problem for neighbouring states. All indicators are that climate change will only accelerate processes of desertification and land degradation within Central Asia. And yet, climate change is only one aspect of desertification and land degradation: Soviet practices of industrial pollution and water disposal continue to spoil the land on a massive scale²⁴.

Accordingly, most of the Central Asian states have prepared national action plans to combat desertification, held various round tables on desertification, and assembled annual reports on desertification. These efforts have involved wider cross-sections of society and been more sincere than efforts connected to other regimes. However, these efforts are not qualitatively different than those existing in other regimes; they are primarily urban and paper efforts. Thus, despite their interest, the states are yet to implement any strong measures to control desertification beyond issuing reports at best as these reports merely track the pace of desertification and land degradation in the region at worst, they do nothing to prevent the enactment of new threats to the land of Central Asia. Therefore, on this front the Central Asian States now need to cooperate and address the problem together²⁵.

H. Environmental Solutions in the Caspian and Aral Basins

Managing environmental problems at the national level is relatively easy but, in the case of international resources, like the Caspian Sea or the Aral Basin waters, the problem tends to become more difficult. There is no single authority that can impose a solution. Hence a solution has to be agreed. In the case of the Caspian basin, the cooperative solution was relevant before the break-up of the former Soviet Union. In the Aral Basin, a national solution applied to the sea, which was internal to the Soviet Union and water was distributed by Moscow, but after the break-up of the USSR, however, the situation changed. The cooperative model became less compelling for the Caspian Basin, partly because the parties have no established relationship in this area and partly because they are unable to control their citizens, some of whose livelihoods came under serious threat after

²⁴ Causes and Dynamics of Conflict Escalation: The Role of Environmental Change and Economic Development/<http://www.prio.no/html>.

²⁵ Jon Barnett, *The Meaning of Environmental Security. Ecological Politics and Policy in the New Security Era*, (London and New York: Zed Books, 2001), pp.29-40

the dissolution, and some of whom are able to act outside the law with impunity, often making considerable profits from doing so. For the Aral Sea, a new situation was created by the internationalization of the basin²⁶.

If the proper actions that are to be taken in order to improve the Caspian situation are to be identified, plus the development programs to assist communities to find alternative, and more suitable livelihoods are to work, cooperation among the littoral states and support from wider international community will be required. For the former it would be ideal if a legal agreement could be signed by all states, but this appears to be difficult. In the meantime, while a framework convention for the protection of the Marine Environment of the Caspian Sea is being developed under the auspices of UNEP, a major interim forum for cooperation, the Caspian Environment Program (CEP) has also been launched. The overall goal of the CEP is to 'promote the sustainable development and management of the Caspian environment'²⁷.

The program draws extensively on lessons learned from other regional seas programs, such as the Baltic and Black Sea Programs, and the Mediterranean Environmental Technical Assistance Program. These more mature programs have demonstrated that regional environmental cooperation can provide an effective forum for relevant agreement or conventions among parties. The rationale behind such a program is that the newly formed states have very few resources to devote to environmental protection, which is, generally, long-term in its impacts. Not spending something today on protection does not immediately compromise the functioning of the economic systems in these countries. In this respect external resources are vital to the success of any cooperation and CEP is a vehicle for these to be made available to the region²⁸.

There is also a need to establish trust between the member states and that is a slow process, which best proceeds through smaller confidence building measures, such as joint programs of training, monitoring, research and the implementation of pilot projects where benefits are shared. In such situation the role of external agencies become very important.

²⁶ Thomas Homer Dixon, 'Environmental Securities and Violent Conflict', *International Security*, Summer 1994, pp.31-33

²⁷ Shirin Akiner, 'Environmental Security in the Caspian' in Shirin Akiner(ed) *The Caspian: Politics, Energy and Security*, (London & New York: Routledge Curzon,; 2004), pp.343-359.

²⁸ <http://www.democracyctr.org/newslettertoc.html>, War over Water, Democracy Centre on-line, Vol. 31, February 2000.

It is these agencies who have to implement the projects and they, who should be centrally involved in identifying the programs that should be funded. Following on from that, the states should also have an important financial stake in the success of the programs or else the case, the CEP will be leading a supply driven agenda that may not succeed in attaining its objectives²⁹.

In order to successfully implement a regional Caspian program, the first challenge is the problem of management, because administrative and procedural capabilities for environmental administration and management happen to be weak in many countries in the Caspian region. Some are in the process of updating their laws for environmental management, and effective implementation is sporadic. The administrative structures also tend to be biased towards inspection and enforcement, rather than education, information and compliance. Thus the CEP measures have to provide assistance in institutional development and capacity building. For integrated coastal zone management and development of a framework convention for the protection of the Marine Environment of the Caspian Sea another challenge is institutional development and capacity building³⁰.

Effective regional cooperation will require effectively applied and harmonized national legislation; standards and environmental regulations based on agreed common environmental standards, and a regional chemical and oil pollution incident preparedness plan. International partners are also needed because the Caspian is a resource that has attracted significant global concerns so there is a need for wide consultations with international partners on the contents of a strategic approach to address the regions' environmental problems. Public private partnership will help to ensure concerted and harmonized environmental activities by the littoral states to create transnational networks, take actions in the stakeholders' mutual interest and to enhance the sea's sustainable development and protection³¹.

Although the rate of contraction of the Aral Sea has decelerated since the mid-1980s, further measures are required to prevent the sea from effectively drying up by 2020. Yet, as with the Caspian Basin, the first decade of independence has brought much talk

²⁹ The Geopolitics of Oil in Central Asia/<http://www.hri.org/mfa/thesis/winter98/geopolitics.html>

³⁰ Thomas Homer Dixon, *op.cit.*, pp.31-33

³¹ Shirin Akiner, *op.cit.*, pp.343-359

about environmental improvement but little action. A regional water management system was agreed in 1994, with each of the five Central Asian states pledging to subscribe 1 per cent of its GDP, a target that they came nowhere near meeting. Three years later an overall regional water management council (ICWC) was set up alongside state – level ministries and two Basin Water management Organisations (BVOs) that were established for each main tributary in 1996³². However, both BVOs accept the historical pattern for water allocation, which is unsustainable, while states refuse to contribute funds in proportions to their withdrawal of water by 1998, the International Fund for saving the Aral Sea was established and also the Interstate council of the Central Asian Economic Association. All these bodies are ineffective and water conflicts continue to be resolved through bilateral deals between states despite frequent failure to comply and severe sanctions levied by aggrieved parties³³.

Regional Cooperation and Integration in Central Asia

The countries of Central Asia are signatories to the Rio Declaration (UN – 1992), and have approved the decisions of the Lucerne (1993) and Sofia (1995) European ministerial Conferences for Environment Protection. The states of the region have joined a number of global and regional conventions for environment protection. Now they aspire to fulfil the requirements of these conventions³⁴.

Today, the countries of the region can formulate and implement independent nature protection policy as well as regional cooperation in the field of environment. The transition to environmentally sound and sustainable development has become a high priority for the development process in Central Asia.

The process of Central Asia consolidation is deepening. The Issyk-Kul (1995) and Nukus Declaration Pave the way for regional actions directed at sustainable development. It was a three day international conference on “Sustainable Development of Aral Sea Basin”, held in Nukus, Karakalpakstan. Among other things they promised to devote more

³² Stuart Horsman, ‘Water in Central Asia: Regional Cooperation or Conflict?’ in Roy Allison, and Lena Jonson, (ed.), *Central Asian Security – The New International Context*, (London: Royal Institute of International Affairs, Washington DC, Brookings Institution Press, 2001), pp.69-86

³³ Ibid, pp.69-86

³⁴ The Geopolitics of Oil in Central Asia /<http://www.hri.org/mfa/thesis/winter98/geopolitics.html>

efforts and funds to ameliorate the Aral Sea crisis and improve the lives of the millions of people affected by it. In February, 1997 the Presidents of Central Asia signed the Almaty Declaration which declared 1998 as the “Year of Environment Protection” under the aegis of the UN in the region. The document reaffirmed the Presidents’ political will to design a common regional strategy for sustainable development. In April 1998, the Central Asia Environment Ministerial Conference was held in Almaty³⁵. It dealt with regional cooperation. During this meeting in Almaty, the ministers reaffirmed their commitment to environmental co-operation in accordance with previous agreements and their intention to design a regional program for environment and set up a Regional Environment Centre (REC) with a network of national branches throughout the region. They also affirmed their wish to deepen ongoing integration into the ‘Environment for Europe’ process, promote regional cooperation and develop solutions for environmental problems in the region in accordance with the initiatives and programmes carried out at the pan-European level.

Based on the decisions of the Almaty conference (1998) a regional working group was formed in Almaty and a draft concept for the Central Asia Regional Environmental Centre was produced³⁶. The preparation of a Regional Environmental Action Plan (REAP) would allow for the production of a regional information system, the analysis of environmental problems, the identification of regional priorities and the design of regional projects. Regional Cooperation in Central Asia in the field of environment protection has to be based on a regional sustainable development strategy after making an assessment of the situation we can see the importance and need of cooperation between the Central Asian states in solving environment problems. In the light of the massive economic and social problems they face one can understand why they are not moving as fast as one would wish in this area, but to ignore it can have serious consequences. Moreover, these consequences will not take long to materialize; indeed we are already witnessing some of the social and economic impacts of the environmental degradation. It’s also inappropriate to think that these losses can be made up by increased oil and gas revenues³⁷.

The above mentioned issues clearly reveal that the Central Asian States have been able to tackle their environmental problems, when interdependence and regional

³⁵ N Myers, ‘Environment and Security’, *Foreign Policy*, Summer 1998, pp.22-41

³⁶ Central Asia : Environment Assessment/<http://www.men.dk/aarhus-conference/issues/nis/assesasia.html>

³⁷ Central Asia an Overview/ <http://www.angelfire.com/rnb/bashiri/Centasia/Centasia.html>

cooperation are involved. Therefore regional cooperation appears to be a perfect way through which further development can be attained.

The facts as analysed in the preceding chapters demand that in order to have a balanced as well as sustainable development, the Central Asian States which are highly interdependent, have to function as one planning unit in the real spirit and strength for the regional development has to be drawn from its imbalanced resource endowment through integrated resource-sharing mechanism³⁸.

Following are some long, medium and short-term sectoral issues, which require an urgent attention, and have to be worked upon for the betterment of the Central Asian region and its environment.

The Issues Requiring Immediate Attention of the Central Asian States

Issues in the Water Sector

The two major water management issues pertain to improvements in irrigation efficiency and have direct bearings on irrigation intensity and finally leading to crop production-cum-productivity. Thus in order to rationalize the water crisis in the region a judicious water management policy is a necessity³⁹.

Since there exists a high order positive correlation between irrigation intensity and crop productivity in Central Asian States. This relationship is almost nearer to perfect positive in the three downstream states of Uzbekistan, Kazakhstan and Turkmenistan, owing to their location, as well as due to very limited water sources. It has been estimated that if the existing irrigation efficiency, in which all the five states particularly the three water-poor downstream states are at the lowest ladder, is improved to a rate of 33.4 percent, then the irrigated area will increase by 3.72 million hectares, the irrigation intensity will increase by 7.18 percent while the agricultural productivity will increase by an index value of 1.692. If the irrigation efficiency is raised up to 75 percent, which is quite possible subject to the usage of modern irrigation technology and groundwater harnessing, in that

³⁸ Environment in Central Asian States/ <http://www.caresd.net/site/html?en=1&id=1>,

³⁹ David R Smith, 'Environmental Security and Shared Water Resources in Post Soviet Central Asia', *Post Soviet Geography*, Vol.36, No.2, 1995, pp.387-98

case almost all irrigable area of the region will be irrigated which will be multiplied by about three-times the existing figure, while the percentage of irrigated to total cropped area will rise up to 64.55 percent. Moreover, agricultural productivity will increase at a rate of 3.32 times when compared to the existing figure, and 1.28 times as against the figure at the efficiency level of 33.4 percent⁴⁰.

Therefore in order to increase the agricultural productivity, the dominant economic sector, and simultaneously to reduce the salinity menace especially in the three water-poor states, irrigation efficiency has to be improved which is possible through the application of modern irrigation technology and some water management devices. The devices of drip irrigation and sprinkler methods, which are comparatively recent innovations, can be used to enhance the technical facilities. Although these techniques are not very economically efficient but have much potential for water saving and are effective water application methods suitable for the region. In order to minimize their cost they can be applied to higher value commercial crops grown near cities and towns like vegetables, fruits and other export products⁴¹.

The system of underground water channels called Karez which draw substantial water to the fields without loss through evaporation, theft, over flowing etc., should have denser network. The use of plastic becomes very handy in this situation as conservation of water by the lining of canals, ponds and other reservoirs, is possible with plastic films. Also there could be conveyance of water to far-flung distances through plastic pipes, leaving the least chance of water loss through leakage, evaporation. In addition, water harvesting and recycling techniques can go a long way in solving the regional water problem. The hillsides and hillocks of Kyrgyzstan and Tajikistan as well as the rocky plains in the dry area of CAS are the potential sites for rainwater harvesting, storage and recycling. By investing on the development, preservation and conservation of water resources, these states will be saving their own future, yes of course, the future of the entire region as well⁴².

⁴⁰ Erika Weinthal, 'Beyond the State Transnational Actors, NGO's and Environmental Protection in Central Asia', in Pauline Jones Luong (ed.), *The Transformation of Central Asia: States and Societies from Soviet Rule to Independence*, (New Delhi: Manas Publications, 2005), pp.246-270

⁴¹ D P Bedford, 'Institutional Water Management in the Aral Sea Basin', *Water International- 21*, 1996, pp.63-69

⁴² Erika Weinthal, op.cit, pp.246-270.

Management of the Aral Crisis

Aral which is considered as the major storehouse of water for Central Asian States fed by two lifelines of the region i.e. Amu and Syr darya, is a strong indicator of the mismanaged water-use model the erstwhile Soviet Union gave to the region. However, after independence all the 5 states have cooperated with some world bodies particularly World Bank, IMF, and UN, which initiated some steps to save Aral by improving water-use efficiency and monitoring the regulatory system. In this context some water management institutions came into existence for which, in addition; to foreign funds, the local governments of five Central Asian States also contributed and allocated some percent of their GDP to the fund for the salvation of the Aral⁴³, but a great lacuna in the management mechanism remains which has recently surfaced and emerged in different forms at different times in different states. Here the two water rich states have taken a justified stand arguing to get special concessions in contributing to water preservation and conservation as they pay a huge cost as upper riparians just to serve the water needs of downstream users.

In this regard so many examples of recurring devastation by floods, socio-economic and environmental impacts as a result of huge reservoirs, after effects of undesired water diversions, ban on potentially irrigable land, stoppage for the development of hydroelectric power, soil erosion menace, navigational barriers and a number of dependent as well as direct impacts can be sited. Therefore it is essentially imperative to the three downstream riparian states to contribute more in different I forms in order to save the Aral, which in turn, stands as a guarantee for their own future existence and development⁴⁴.

Issues in the Energy Sector

The energy market of the world is growing at a rapid pace but simultaneously we cannot oversee the impacts of irrational energy extraction throughout the world, and in

⁴³ N H Glavoskiy, 'Ideas on An Escape From the Aral Crisis' ,*Soviet Geography* ,Vol.32, February 1991,pp.73-89

⁴⁴ Zainiddin Karaev, 'Water Diplomacy in Central Asia', *The Middle East Review of International Affairs*, Vol9, No.1, March 2005, pp.5-10

Central Asian States especially. Thus there is need for the world to reduce its dependence on exhaustive resources and need to opt for energy alternatives⁴⁵.

Reducing Dependence on Hydrocarbons: The world economy over the past generation has moved from farming soils to mining them, which happens to be an unsustainable developmental path. It has resulted in yielding an excessive dependence on hydrocarbons, particularly oil, and led to consumption of the economy's biological support system. Due to OPEC whose price rises led to alternative energy resources and this shift has been restructuring the global economy⁴⁶. Just as the shift from solids (coal) to liquids (oil) reshaped the economic system during the first three-quarters of the 20th century followed, by reliance onto gases (natural gas); the shift from oil to alternative energy sources can bring profound change in the decades ahead. Here it is pertinent to note that the 14 percent fall in world oil consumption between 1979 and 1983 was achieved mostly by substituting energy from non-oil sources, and partly by improving energy efficiency and conservation. Hence oil and gas can be conserved by using it more efficiently and focusing on alternative energy sources⁴⁷.

In case of former, the world's transport system deserves careful attention. Within transport it is automobiles that dominate. So raising fuel efficiency of automobiles is thus a key to reducing world dependence on oil. The second dominant area needing conservation pertains to heat-cool system. Renewable fuels i.e., coal and wood can be the better alternatives, being eco-friendly, and sustained in nature. The development of renewable energy sources which presently provide more than 18 percent of the world's energy mainly in the form of hydro-power and wood fuel, have unfolded at an unprecedented scale and pace since the 1973 oil embargo⁴⁸.

There are several other energy alternatives, which have future potentials. But it is also a fact that energy transition cannot be abrupt but the key to available approach is that the world manages the transition gradually - phasing in new fuels before the old ones run out and simultaneously reshaping economies and societies. Each energy resource

⁴⁵ G M Mir, *Resource Management, Regional Cooperation and Sustainable Development in Central Asian State*, (New Delhi: Prince Art Printers, 2003), pp.25-40

⁴⁶ The Geopolitics of Oil in Central Asia/ <http://www.hri.org/mfa/thesis/winter98/geopolitics.html>

⁴⁷ GM Mir, op.cit, pp.25-40.

⁴⁸ The Environment Encyclopedia and Directory-2005, (London and New York: Routledge Curzon, 2005), pp.45-70

alternative to oil and gas has to be carefully developed and trade-offs carefully weighed if renewable energy resource is to provide the maximum benefit to society. Its sustainable nature, eco-friendly status and after effects should be examined beforehand⁴⁹.

Issues in the Environmental Sector

Because of the unwanted man-nature interaction resulting in 'ecosystem disturbances' especially in fragile environment like on the mountains and in the deserts of Central Asian States, the environmental protection laws followed by capital punishments, have to be passed. Environmental protection must be treated as an integral part of the entire macroeconomic reform process in the region. Environmentalists have a major role to play while framing the planning perspective for the Central Asian States because these states do inhabit one of the most vulnerable parts it may be unprecedented floods in mountainous states or be salinity menace and health hazards in the three downstream states.

The recent years have witnessed some unhealthy heights in this regard. For example, Kazakh zone of the Caspian - a protected area and possibly spawning ground of 90 percent of the world's sturgeon stocks, where a relatively minor breakdown at an oil field, a leak of half a million tons of oil into the sea would be enough to make sturgeon extinct in the area⁵⁰. Ecologists had voiced concerns about the concerned consortium's work. However, not only were their opinions ignored, but also they were not even allowed to take part in the preparation of the programme. There are so many examples emanating from other states as well. So it becomes the foremost responsibility of the respective local governments as well as the public, in large, not to allow such things happen. It is also the moral duty of investors as well to take note of such follies.

Central Asian States are faced with the problems of ensuring the preservation of environment, which was subjected to severe degradation. Environmentalists compare the consequences of the disaster of Aral with those of the Chernobyl explosion. The slow pace of replacing absolute and "environmentally harmful technologies and a reduction in investment in environmental protection activities at a stable level of 1.1 percent of the

⁴⁹ GM Mir,op.cit,pp.25-40

⁵⁰ The Caspian Crisis/ http://www.caviar_emptor.org/Caspian.html

capital expenditure, as well as a non-serious irrigation management policy are some of the major factors responsible for such an ugly show. Although the State Committee for Natural Protection (SCNP) initiated some fines and fees and the environmental auditing, but the laws governing these institutions are still new and enforcement has not yet caught up with intentions. So these moves need to be intensified and the results should not be measured by the amount of revenue collection but by reducing unlawful things as the basic purpose of fines should be to ensure compliance with permits and not the revenue generation⁵¹.

As far the two mountainous states are concerned; it is important to improve environmental monitoring and information system for enforcement, monitoring natural disasters and planning for water resource allocation. Field monitoring and laboratory equipment need to be upgraded just to cope up with the emerging environmental hazards such as floods, erosion of soil by rain, water and wind. Within the short-term measures, new standards and methodologies for collecting and analysing data have to be developed and environmental management awareness trainings should be imparted, while the long term preventive measures may cover new sewage treatment plants, system for solid and hazardous waste management with necessary treatment and disposal facilities. Over the last quarter of the past century two new and complementary themes have had considerable impact on the development of the contemporary international law - "environmental protection and sustainable development"⁵².

After the World Commission on Environment and Development (WCED) or Brundtland Commission published its influential report "Our Common Future" in 1987 and since then the environmental protection has got legal support as well. The concerned governments in Central Asian States can take full benefit from this legal institution and can force people to abide by the set rules and laws. The local legislations can also be strengthened on this pretext and no investor or any multi-national company can now dictate to environmentalists working anywhere for sustainable, human welfare.

The present fast changing world in which economic interests are by-passing the human values and where every individual, group, state and power is in fray of jeopardising

⁵¹ The Decline of Caspian Sea Sturgeon/ www.isar.org/isar/uzbek.html

⁵² Lester Brown, op.cit, pp.3-20

the rights of others, reminds us the past in which such selfish motives often led to conflicts whose unresolved accumulation resulted in dire consequences of wars, terrorism and above all, life-threatening environmental pollution as well as a disturbed eco-system. The Central Asian region as we have examined was not an exception. At present the ecological conditions in the whole region are serious. This region which till recently was a component of the planned economy with a different agricultural model, had almost neglected the sustainable approach for the regional development due to the central command hardly bothering and foreseeing the future of this region. This shortsighted governance led to severe resource depletion⁵³.

On the other hand, it's the close relationship between environment and development, which gave rise to the ideology of sustainable development. Thus if in the present times, all the five Central Asian States, with support from international organisations make sustainable development a long term objective, that shall comprise of a series of processes and viewed as an on going and continuous project, then surely the Central Asian States can tread the path towards sustainable development.

The following are all the international treaties to which the Central Asian States are a part of:

Kazakhstan⁵⁴	
Treaty	Status
Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.	Signed on June 1998. Ratified on Oct 2000. No enabling legislation, limited access to courts.
Agenda 21	Non-compliance submitted a few vague paragraphs in 1997. Currently effort underway to submit full report.
Convention on Biological Diversity (CBD)	Signed on 1992. Has Government acceptance on 1994. Late submission of

⁵³ Esra Hatipoglu, 'Regional Cooperation between Central Asian Republics and Integration Movement' *Eurasian Studies*, no.17, Spring- Summer 2000, pp.65-89.

⁵⁴ Source: Eric W Sievers, *Post-Soviet Decline of Central Asia: 32 Sustainable Development and Comprehensive Conflict*, (London: Routledge Curzon, 2003), pp.151-170.

	national report
Convention on International Trade in Endangered species (CITES)	Acceded in 1999. Entered into force in 2000 April
Convention on law of Non-navigable uses of International Water courses	Voted to adopt it failed to sign and apply the provisions
Convention on Long Range Transboundary Air Pollution	Acceded in Oct 2000
Convention on the Protection and Use of Transboundary Water courses and International Lakes	Acceded in Oct 2000 but fails to apply provisions to potentially favourable leverage in disputes over Syrdarya, Ili and Irtysh.
Convention on Transboundary Environmental impact Assessments	Acceded in Oct 2000
Convention on Migratory Species (CMS)	Internal government argument on accession
Convention to Combat Desertification (CCD)	Signed 1994 Ratified – 1997
Framework Convention on Climate Change	Signed 1992 Ratified – 1995
Kyoto Protocol	Signed 1999
Global Environment Facility Rule Compliance	Failed to notify GEF of Change of focal points
Vienna Convention on Ozone	Acceded 1997
Montreal Protocol	Acceded 1997

Kyrgyzstan	
Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental matters	Failed to Accede
Agenda 21	Non-compliance
Basel Convention on Transboundary movements of Hazardous Wastes	Ratified 1996
Convention on Biological Diversity	Ratified never provided a national report
Vienna Convention on Ozone	Acceded 2000
Montreal Protocol	Acceded 2000
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Signed – 1999 Ratified 2000 One of first three states in the world to ratify
Convention on Long Range Transboundary Air Pollution	Acceded 2000
Convention to combat Desertification	Acceded 1999
Framework Convention on Climate Change	Acceded 2000

Tajikistan	
Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	Failed to Accede
Agenda 21	Non-compliance
Convention on Biological Diversity	Ratified 1997
Convention to Combat Desertification	Ratified 1997
Framework Convention on climate change	Acceded 1997
Vienna convention on Ozone	Acceded 1995
Montreal Protocol	1997 Acceded
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Signed 1998

Turkmenistan	
Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental matters	Acceded 1999 but no credible movements to implement
Agenda 21	Non compliance
Basel Convention on Transboundary movements of Hazardous waste	Ratified 1996
Convention on Biological Diversity	Ratified 196 never submitted national report
Convention on Migratory species	Signatory of few MOUs
Convention to Combat Desertification	Signed 1995 Ratified 1996
Framework Convention on Climate Change	Accession
Vienna Convention on Ozone	Accession –1993
Montreal Protocol	Accession 1993

Uzbekistan	
Aarhus Convention on Access to Information, Public participation in Decision-making and Access to Justice in Environmental Matters	Likely to sign
Agenda 21	Compliance with original and +5 reporting requirements
Basel Convention on Transboundary movements of Hazardous wastes	Acceded 1995
Convention on Biological Diversity	Acceded 1996 Provided national Report
Convention on International Trade in Endangered Species (Cites)	Acceded 1997
Convention on Migratory species	Ratified 1998
Convention to combat Desertification	Signed 1994 Ratified 1995
Framework Convention on Climate Change	Acceded 1993
Montreal Protocol	Acceded 1993
Vienna convention on Ozone	Acceded 1993

CHAPTER V

CONCLUSION

The concept of sustainability has as its core a value set that is best described as a parallel care and respect for the ecosystem and people within-not one or the other, not one more than the other but both together as one. Therefore, the economy is not considered to be in competition with the environment and the needs of people are not seen to be in competition with the ecosystems of which they are a part. Sustainability is viewed as an explicit expression of interdependence.

Time and again it is being proved that it is human behaviour which contributes to the risk that the biosphere may be unable to sustain some life forms and some ways of living. Human insecurities like poverty and inequality are at the root of many environmental changes. The Central Asian States are not an exception to this.

In the past this region was endowed with a delicate and fragile ecosystem. There were abundant forests as well as large deserts, several deep lakes as well as big mountains. The life style of the people was in complete harmony with nature. These local inhabitants treated the land with respect, husbanding it carefully to protect it from the damaging consequences of overuse.

Things began changing after the region came under Soviet occupation. By the later part of the 20th century, much of Central Asia has been intensively developed and as a result, the natural resources were utilised to the fullest and its carrying capacity had also been strained to a large extent. The blame for this situation, can, in large measure be placed on the Soviet rule that imposed unsuitable and unsustainable development programmes on these vulnerable regions, without caring about the harmful effects that these development programmes would have on the environment of the region. Their only motive was to achieve more and more economic growth and earn lots of profit.

The result of such motives is that the region today is plagued by all sorts of environmental problems: be it the land degradation, severe water crisis, desertification, soil salinity, loss of biodiversity and habitat, industrial pollution, harmful effects of mining and also the after effects of nuclear testing and production sites. Although it is too late to prevent all these problems; but over time they can be mitigated and the Central Asian republics can adapt themselves to those problems.

So far the Central Asian states have still to recognize the gravity of their problems, especially the nature of the relationship between population, resources and environment. It has been hard to convince people that there are limits either to the supply of raw materials or to the sinks for the pollution because they were not familiar with the concept of sustainable development, which is a process where the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony, and which enhances both current and future potential to meet human needs and aspirations. In order to confront this interlocking and wide ranging group of issues the Central Asian States need a different thought perspective.

Sustainable Development implies that sort of development which is capable of meeting and catering to the needs of the present generation without compromising with the future generations' ability to meet their needs, moving towards this kind of inter-generational equity has several implications which include stabilizing population levels; protecting the natural systems; merging environment and economics in decision making at national and international levels; accepting limits to economic growth and recognizing global interdependence.

As the natural resources in the region are already depleted, their demand has not. Instead demands are increasing day by day, due to rise in population. Therefore the level of population has to be kept under control in the Central Asian States.

The natural systems in the Central Asian region that have degraded are ought to be preserved and protected. For this huge amount of money is required, which the Central Asian States alone cannot afford. Therefore to maintain such process it is necessary to have coordination among all local, national and inter-regional institutions, as well as the world community.

So far the Central Asian States have not been very successful in establishing regional cooperation, which is certainly a key to attain sustainable development. More efforts are still required on the part of these states to forge regional unity among them. These countries, in order to achieve the larger goal of sustaining their habitat and environment, will have to leave aside their disputes and learn to cooperate more with each other.

After independence, the economic situation of the Central Asian States was in a very bad shape and therefore it was not easy for the policymakers in Central Asia to give the environmental consideration due weight in decision-making. Economic growth was cited as the only way out of all problems, but growth in this sense is very often misleading as it takes no account of the impact of growth on the environment or of the inevitable loss of natural resources.

Thus in order to make up for the loss, the Central Asian States need to look at the optimum management of their economics within the limits. They have to take care that the rate of use of renewable resources (like soil, water and forests) shouldn't go beyond the rate of regeneration; the rate of use of non-renewable resources (such as fossil fuels, minerals, ground water) should not exceed the rate at which sustainable alternatives can be developed; also the rate of emission of pollutants should not exceed the capacity of the environment to assimilate them.

Currently the need for new thinking is well recognized in Central Asia. A lot of responsibility lies on the governments, business activity and public participation through education, academia, NGOs and others.

The governments of Central Asian States are already under a host of obligations arising from conventions such as the Vienna Convention on Ozone, Montreal Protocol, Convention on Biodiversity and the GEF. They are also under a multiplicity of national obligations and it's only the government that can, through regulation set ground rules, market instruments, promote better environmental management, encourage new technologies and greater efficiency and introduce environmental accounting in their national budgets. The role of business is equally fundamental. All business activities should take account of environmental considerations.

The governments of Central Asian States cannot act alone; they need full public participation. Public participation in the region has been rising for quite some time now. They amount to a formidable source of persuasion for improvement. To make the public more aware about the move towards sustainable development, the education curriculum plays an important role. For concrete results in attaining sustainability, the future generations of Central Asia, that is the children will have to be taught right from their childhood about the importance for caring about their surroundings.

The whole of Central Asia requires a better understanding of the environment, and even more, they have to make its care a natural part of their lives. This implies taking a longer perspective and looking to the future as well as the present generations. Now in trying to cope up with the legacy of inappropriate development policies of recent decades, the people of Central Asian region are discovering a sense of solidarity, united by a determination to relearn the secret of working with, rather than against their complex environment. They are becoming aware that sensitivity to the natural world is a unifying factor amongst them. Thus the sustainable modes of development are today very much a regional cause and in this sense may be considered to be a defining feature of Central Asia.

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