WATER RELATED PROBLEMS OF CENTRAL ASIA: CHALLENGES FOR SUSTAINABLE DEVELOPMENT IN THE ERA OF GLOBAL WARMING

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Abstract: As the effects of global warming become severe the worries of the Central Asian countries are likely to increase. Global warming would result in excess rain or in its shortage. Either way it carries the danger of catastrophic consequences. The shrinking of glaciers in the mountain ranges would seriously hamper the water supplies, as in addition to rain, glaciers are important source of water. In such a likely scenario, the conflict between the upper stream and lower stream states is likely to accentuate which may have serious implications for the geo- politics of the already volatile region of Central Asia.

Keywords: Central Asia, Climate change, Industrialization, sustainable development,

The common property resources became distinct field of study in the late 1960s, with the publication of Garrett Hardin's seminal article, "The Tragedy of the Commons," in 1968 published in *Science*, wherein he argued that freedom to exploit common property resources brought ruin to all. The common property being available to everyone free of cost tends to be over exploited. The fish stocks are over-harvested, meadows overgrazed, rivers polluted, the ozone layer depleted because market mechanism such as price does not restrict the consumption (cited in Varadarajan, 2009, p.9). So long as the immediate cost of production is zero and the long run marginal cost is also less than what an emitter might have to spend for using a different production technique that limits green house emissions, the emitters would not be constrained from over using the atmospheric commons. Hardin wrote, the "rational man finds that his share of the cost of the wastes he discharges in to the commons is less than the cost of purifying his wastes before releasing them" (cited in Varadarajan, 2009, p. 9) This has led to the fouling of our own nest that is borne out by the pace at which green house gas emissions have increased, ever since industrial revolution began more than 150 years ago. In the years from 1500 to 2000, the concentration of carbon dioxide has grown by 30 percent, methane 151 percent and nitrous oxide 17 percent (Nandan, Joon and Jaiswal, 2009, p. 362). The warming of the earth at an unusual speed, melting of glaciers and rising sea level have emerged as the key issues of the contemporary time. Deforestation, bio- mass burning and land use practices which release carbon dioxide, methane and nitrous oxide are the key catalysts of such a phenomenon. The US and Canada with 25 percent share of the emissions; Europe with 21 percent; developing Asia with 19 percent; former Soviet Union with 12 percent; Latin America with 11 percent; Middle East and Africa with 7 percent and Pacific Asia with 5 percent are the culprits (Nandan, Joon and Jaiswal, 2009, p. 363). In this regard even the former Soviet Union, having adopted the socialist model of economic growth, did not lag much behind the capitalist countries. With the raising of gross domestic product becoming the desirable goal for the Soviet Union as well, it could not provide any "new paradigm to deal with the problem of more production, more waste, more pollution and rising global warming"(Singh, 2009,p.10). The period from 1998 to 2007 has been recorded as the warmth decade in human history. Since, 1850 when temperature started being recorded, eleven warmth years have occurred in the past 13 years. The Global Humanitarian Forum set up by Kofi Annan reported recently that climate change is causing 300,000 deaths every year and the ill- effects continuing could lead to 500,000 deaths a year by 2030 (Singh, 2009, p.10). The change is adversely affecting 300 million people and 310 million more are likely to add to this category in the next 25 years and 75 million extra people will be displaced by the climate change.

Kyoto Climate Protocol signed in1997 aimed at rolling back green house gas emissions from the industrialized countries by 5.2 per cent making 1990 the

basis, the promise that has not been achieved so far (Desai, 2009, p.358). The developed industrialized countries, which are responsible for over three quarters of accumulated greenhouse gas emissions, had the obligation to act as per the agreed principle of 'common but differentiated responsibility and capability', for reducing such emissions. The stipulated limit for achieving roll back was 2005. However, in reality since 1992 such gas emissions have increased by about 17 per cent (Raghunandan, Purkayastha and Jayaraman, 2009, p. 10). United States, until recently number one emitter of greenhouse gases in absolute terms, now biggest emitter in per capita terms, has made no commitment for binding emission targets. The Kyoto Protocol has in fact diluted the climate equity and justice perspective of 1992 United Nations Framework Convention on Climate Change (UNFCCC) by introducing market driven strategy for reducing gas emissions. The industrialized countries consider the financing of low carbon emitting technologies to the developing world as an opportunity for investment, not a climate change equity issue (Raghunandan, Purkayastha and Jayaraman, 2009, p. 10). Moreover, contrary to the principle of differentiated responsibility these countries especially the United States want states like China and India to share the burden of ensuring cuts in emissions. The Copenhagen climate summit held in December 2009 did not make much progress on this front as the participating countries failed to reach legally binding arrangements for ensuring emission cuts.

The global warming has global consequences and therefore, the globe as a whole would be adversely affected by such an occurrence that is under way in a big way. However, certain parts of the globe by virtue of their location and topography are more vulnerable than others. The region of Central Asia comprising Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan has such vulnerability. Taking cognizance of the formidable challenges these countries face in the contemporary times of global warming, in 2007 the United Nations' Intergovernmental Panel on Climate Change (IPCC) pointed out that soon the region's mountain ranges will not be able to provide water required for supporting the prevailing agricultural practices (Eurasianet, 2007, p. 1). It forecast avalanches, increased run-off and earlier spring peak discharge from glaciers and floods due to unseasoned rains. It predicted that by the end of this century disappearance of glaciers in the Tien Shan, Pamir and Hindu Kush mountain ranges will result in decreased river flows, leading to severe water shortages. The temperature could increase drastically, resulting in the fall of crop yields to the tune of 30 percent by 2050. As a result the cotton industry could be doomed because with the decreased quantity of water system of irrigation would be ruined that is the lifeline of the crop. Central Asia's cotton sector collapse could lead to mass unemployment in an already unstable Ferghana Valley. In Tajikistan the cotton occupation employs about 80 percent of the country's rural labour force and is its second largest export commodity. In Uzbekistan cotton employs three million people, generates 24 percent of the country's 8.7 billion GDP, providing it an annual income of over $ 1 billion and these exports account for about 60 percent of the hard currency exports of the country (Eurasianet, 2007, pp. 1-2). Water scarcity of this nature could result in serious conflict situation in the region, the indication of which has already appeared, as the issue of utilization of water has become thorny issue between upper stream states of Tajikistan and Kyrgyzstan and lower stream states of Kazakhstan, Turkmenistan and Uzbekistan.

The ill-effects of global warming and climate change are being felt in the region of Central Asia as the Aral Sea has shrunk by almost 30 percent in the past two decades because the flow of water in the Amu Darya and Syr Darya, two major rivers of the region, has been reduced drastically. The intensified water demand for purpose of irrigation and industrial use has created a situation of acute shortages. The intensive irrigation required for the cultivation of the cotton, which is a major crop of the area, has led to the gradual disappearance of the Aral Sea that was once fourth largest inland body of water and which now have split in to three water bodies. Not only the size of the sea has been reduced even the depth of the water in its remaining part has decreased alarmingly as from a depth of 53 meters in 1960 it has gone down by 23 to 30 meters in 2008 (Sengupta, 2009, p. 330). This has seriously effected the occupation of fishing and health of people in the Aral Sea area. Due to increased surface evaporation, soil salinity that kills the productivity has become serious problem. According to another source, Aral Sea which shrank from 68,000 square kilometers in 1960 to ten percent of that by 2007 has produced five fold increases in salinity, killing most of its flora and fauna (Hilton, 2009, p.1). The fishing industry which once employed 40,000 people has virtually collapsed and the Aral Sea basin is now a devastated saline landscape, heavily polluted since the time of Soviet weapon testing and chemical weapons. It is believed that toxic dust is still carried on in Central Asian winds, which with reduced body of water, has become hotter resulting in drier summers in the region. With global warming becoming more severe, the already reduced size of snow covers and glaciers is likely to shrink further. This kind of happening in a developing region like Central Asia that is marked by high share of agriculture production, low industrialization, mass unemployment and high population growth, signals turbulent times in future.

The mismatch between the supply of water and its demand is further accentuated by the fact that lower stream countries especially Uzbekistan and Turkmenistan are heavily dependent on water resources of the upper stream countries that is Kyrgyzstan and Tajikistan where right now water supply is not a problem. The two main basins of Syr Darya and Amu Darya rivers are shared by several states but the lower stream especially the more populous states like Uzbekistan and Kazakhstan are in a disadvantageous position as compared with less populous upper stream countries that is Kyrgyzstan and Tajikistan. Despite the fact that Syr Darya is divided among four countries, originating in Kyrgyzstan, passing through Uzbekistan, Tajikistan and finally running in to Kazakhstan, its water is not evenly distributed. Uzbekistan the most populated in Central Asian does not control the important stretch of the Syr Darya with the Karakum reservoir that passes through Khodjent region of Tajikistan and gives later nine percent of the total usable water for regulation in the Syr Darya basin (Sengupta, 2009, p. 331). Likewise, Kazakhstan is in control of Chardara Lake that enables it to control almost one fifth of the usable storage capacity in the basin. Similarly, mismatch between the quantity of water required and its availability is discernible in the division of Amu Darya waters between less populous Turkmenistan, whose river basin is inhabited by four million people and more populous Uzbekistan that has river basin which is host to14 million, on 40/40 basis. The clash of interests of upper stream and lower stream states, on the issue of utilization of water for generating hydro power, has already created a conflict situation between Kyrgyzstan and Tajikistan. In these two countries the share of hydro power in energy consumption is more than 50 percent, while Uzbekistan and Kazakhstan are less dependent on hydro power. In view of the situation of more water less power of the upper stream Kyrgyzstan and Tajikistan, these states have been working on plans to build new dams for augmenting power supplies. As in the last couple of years, energy crisis of Tajikistan became severe the urgency to generate more power from water was felt more widely. In the beginning of 2009 there were reports of Nurek reservoir, which powers the country's largest hydropower station, not getting enough water intakes for generating power. The Kyrgh government had to impose restrictions on the use of hydro power and in its place recommending the usage of coal (Sengupta, 2009, p. 332). The Uzbek and Turkmen governments' plea for examining environmental and ecological issues related to the construction of new dams, notwithstanding, at the moment the upper stream countries of Tajikistan and Kyrgyzstan, in view of shortage of energy, seem determined to add new dams.

The Russian President Dmitry Medvedev during his visit to Uzbekistan, in January 2009, discussed the issue of building of new dams by upper stream states with his Uzbek counterpart Islam Karimov on January 23 and declared that Russian investment for building hydro-electric power stations in Kyrgyzstan and Tajikistan would be undertaken only if schemes took in to account the interests of other states of the region (Osmonalieva, 2009, p. 2). He opined that such projects involving rivers that cross state borders had to be agreed by all the countries effected, not just the direct beneficiaries and needed to adhere to environmental and other international standards. This indicated a major shift in the earlier Russian position that favored hydro- electric projects both in Tajikistan and Kyrgyzstan, unmindful of Uzbek fears that damming up of rivers that feed great Amu Darya and Syr Darya water ways, will starve it of the irrigation facilities on which its agriculture depended. The launching of hydro- electric power station entails filling up of reservoir over several years. Therefore, if these upper stream countries went ahead with such power projects, the Uzbekistan would face a huge water shortage problem during the period of the filling up of the reservoir, the situation that could be disastrous for the agriculture of the country. As was expected both Kyrgyzstan and Tajikistan reacted very sharply to Russian volte-face on the issue of investment in hydro electric projects in these countries (Osmonalieva, 2009, p. 4). They also argued that the water has a value just like fuel and therefore, Uzbek government should contribute financially for the maintenance of regulatory systems such as dams. Moreover, Uzbekistan and Kazakhstan sell their oil and gas on commercial rates and charges near world market prices for such sales to Kyrgyzstan and Tajikistan. In the opinion of the upper stream states the claims of lower stream states on water, as a free natural commodity, are unrealistic as they charge market prices while selling their natural resources to the former.

With effects of global warming more severe the worries of the Central Asian countries are likely to increase. This may result in excess rain or in its shortage, both ways it has the potential of resulting in catastrophic consequences. The shrinking of glaciers in the mountain ranges would seriously hamper the water supplies, as in addition to rain, glaciers are important source of water. For instance contrary to popular notions rainfall supplies only one fifth of Kyrgyz waters, rest comes from the glacier of the Tien Shan mountain range.

As noted above, certain parts of the globe by virtue of their location and topography are more vulnerable

than others, though in the long-run globe as a whole would be adversely affected by the occurrence of the global warming. The region of Central Asia in close proximity to China which has by now become the biggest emitter of greenhouse gases has its own worries because global warming has immediate area specific regional dimensions, to be surely followed by the global consequences. The latest projections from reputable climate scientists indicate that gas emissions are rising at alarming pace in the neighborhood of Central Asia. The China having doubled its gas emissions between 1996 and 2006, which come largely from coal- burning electricity plants, has not only become world's largest producer of carbon dioxide but is set to enjoy such a dubious distinction in near future as well because it has announced its plans to rely on coal as its main source of energy, for which it will further increase coal production to the tune of 30 per cent by 2015 (Krugman, 2009, p. 11). Ironically, environmental legacies of Soviet era are proving to be unmanageable even in the post-Soviet era. Central Asia as a region was widely used by the former Soviet Union for uranium mining and nuclear testing, the ill effects of which are continuing even today. Even water scarcity, a crucial issue in current politics of the region is partly attributed to poor management of this precious gift of the nature, in the Soviet era. Now when the danger of the disappearance of glaciers in the mountain ranges, which feed the rivers of Central Asian region, is becoming real, Soviet Union having contributed twelve percent of the green house gases emission could not run away from the blame of creating a situation where, owing to global warming, the disappearance of glaciers may result in acute shortage of water for these countries. The global factors, as elsewhere, militate against the environmental health of this region as well. However, China having emerged the biggest emitter of green house gases in close vicinity to the Central Asian region can be an added worry for the countries of this area because global warming in the immediate effect has regional area specific dimensions, which in the normal course are to be followed by ill consequences for the globe as a whole. Therefore, Central Asia in view of its location and topography and its proximity to biggest emitter of the world can, by no means, consider itself a zone of comfort, so far as the issue of environmental degradation is concerned.

With per capita consumption of water reduced to1600 to 1700 cubic meters from the present level of around 2800 cubic meters by 2020, as population of the Central Asian region would rise to more than 60 million by that time, the competition for water would become more intense (Lifan, 2009, p. 24). This becoming a reality the Central Asia will fall into the official UN classification of a 'serious water shortage area'. The enhanced water scarcity for this already troubled region may pose formidable challenge for the sustainable development of the region as in the post- Soviet era appropriate remedial measures have been lacking. Water use is now being regulated by independent states unilaterally, whereas under the prevailing circumstances the common approach is needed for reducing stress on the shared water resource. The countries have failed to negotiate cooperative water regime because trust is low between lower and upper stream states. The Central Asian countries have increasingly adopted zero-sum positions on the issue of water resource and have raised the level of consumption to unsustainable level. The situation has been accentuated by the asymmetrical relationship between the downstream states that are militarily and economically stronger and the poor and weak upper stream states (Granit, Jakob, Jagesskog, Anders, Lofgren, Rebecca, Bullock, Andy, Gooijer, George de, Pettigrew, Stuart and Lindstorm, Andreas, 2010, p. 8). For instance in 1992 disagreement between Kyrgyzstan and Uzbekistan on the distribution of water from Toktogul reservoir , located in the former, led the later to move its airborne forces to the Uzbek-Kyrgyz border, thus putting pressure on the Kyrgyzstan. In 2008 during Shanghai Cooperation Organization (SCO) Uzbek President Karimov criticized water rich upper stream states for using water resources as pressure tactic on his country. Subsequently in February 2009 Tajik President did not attend Collective Security Treaty Organization (CSTO) Summit in Moscow because Russian President became reluctant to support Tajikistan on the issue of constructing Rogun hydropower project. The widespread corruption and lack of democratic institutions are the barriers to adequate appropriate response to the issue of water management which with the impact of global warming becoming more severe may put big question mark on the sustainable growth of the region.

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