

Climate Change, Energy Security and Societal Vulnerability in Eurasia

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Abstract: Climate change, energy security, and societal vulnerability are three normative frameworks providing a “context” to study the notion of “sustainable security”. Demand for “fossil fuel is growing”, hence, a greater concern for securing “cleaner energy” along with maintaining a “harmonious” and “sustainable environment” also exists. The present article attempts to highlight how to maintain a delicate balance between these two above-mentioned normative frameworks to ensure “sustainable security” in Eurasia. The important aspect that needs to be highlighted here is while in the Arctic and Siberian parts of Russia along with the Caspian Region, the energy sector is playing a catalytic factor for climate change, on the other hand, in parts of South Caucasus and along the Baltic, though energy is not a major factor, still they are experiencing climatic change with negative consequences. In Central Asia, however, climate change is putting a stress on “hydropolitics”, this, in turn, is aggravating the “societal insecurity” in terms of “accessibility” to hydro-energy. Henceforth, Eurasia requires a more sustainable and pragmatic policy framework in the context of addressing problems associated with the three above-mentioned normative trajectories.

Keywords: Climate change; Energy security; Hydropolitics; Societal vulnerability; Eurasia.

Introduction

The Eurasian region, (consisting largely of the post-Soviet states) occupies a “pivotal position” in the “global geopolitical map”, is experiencing the adversarial impact of climate change in recent years. This may be attributed to the geographical location of these states, exploitation of natural resources without showing concerns for the environment both during Soviet times and in the present situation, along with the lack of adequate policy response from different parts of the region to combat the crisis (Orme, 2013; Kelmelis, 2011; Sato and Nakamura, 2019; Bridge et al., 2013; Hill and Gaddy, 2003; Deudney, 1990).

The present article examines five important regions of Eurasia, namely, Central Asia, Caspian, South Caucasus, Arctic and Siberian along with the Baltic region.

Though these are a broad categorisation of regions in the context of Eurasia, some of the states, for example Turkmenistan and Kazakhstan are parts of Central Asia as well as Caspian littoral states. Similarly, Azerbaijan comes under the ambit of both Caspian basin and South Caucasus region. So also, Russia, is both an Arctic and Siberian power in addition to sharing the Caspian basin. The basic objective of the present study is to highlight that how far two normative frameworks, climate change and energy security, are triggering social vulnerability in Eurasia (Sato and Nakamura, 2019; Adger, 2006; Barker, 2003; Brown and Corbera, 2003; Groisman and Soja, 2009; Mohapatra, 2014). One interesting aspect of the present study is to underline how some of the regions of Eurasia such as Baltic and parts of South Caucasus though not so rich in energy resources are also facing problems associated with climate change.

The three normative frameworks, climate change, energy security and social vulnerability, are operating in “isolation” and at times “interacting” with each other; thus posing a threat to the “sustainable security” of the broader Eurasian region (Adger, 2006; Barker, 2003; Lkeme, 2003; Orme, 2013; Bridge et al., 2013; Dalby, 1992). The present article will gauge the effect of climate change in different parts of Eurasia. It will also examine to what extent energy exploration, in both Siberia and the Far East and the Caspian region, can accentuate the process of climate change, which, in turn, shapes the “contours of social vulnerability”. Studies suggest that climate change has activated several deadly viruses that are present in the atmosphere. Some of these viruses, dormant in the Eurasian region, over the years, are now reappearing because of climate change. This makes the present research more relevant in the present context (WHO; Wyns, 2020; Shope, 1991; Telegraph, 2019; Few, 2006; Bridge et al., 2013; Lehmann et al., 2015). The article will use extensive primary and secondary sources to give a perspective on the problem. However, a normative understanding is necessary to gauge the dynamic interrelationship among climate change, energy security and societal vulnerability in the context of Eurasia.

Normative Framework

While looking at the normative framework to understand the present study, it is pertinent to mention U.N Secretary-General António Guterres’s statement in the context of West Africa. He highlights the “adverse effects of climate change and epidemics, which contribute to the high levels of structural, chronic and acute vulnerability in the region” (UN Security Council, 2018). From the speeches of UN Secretary-General, one can infer that climate change itself does not directly contribute to the accentuation of conflict, on the other hand, as studies say, it incubates the “conflict situations” through cyclic environmental impact like “fluctuation of temperature, which will also impact food production, food shortage and its distribution in the community”. Thus, as argued, the scarcity of food production heightens societal conflict and social vulnerability (Ibid; Dudney, 1990; Adger, 2006; Barker, 2003; Brown and Corbera, 2003; Lkeme, 2003; Deudney, 1990; More, 2013; Dalby, 1992; Mohapatra, 2014). In addition to this, climate change often contributes in spreading of deadly viruses and of pandemics as discussed above (Shope 1991; WHO; Wyns 2020; Few, 2006). Mach et al. (2014) on the other hand, highlight the parallel between “climate change and

the proliferation of armed conflict”. The study points out that “a substantial increase in conflict risk due to climate grows from 0% to 15% of conflicts to date to 10–50% probability in the ~4°C scenario” (Mach et al., 2019). Barnett (2003) also gives a comprehensive exposition to the “interrelationship” between climate change and security. He states that “it poses significant risks to the livelihoods, culture and health of many millions of people in many different social and ecological and contexts” (Bernett, 2003). The view of Bernett (2003) can be substantiated from the UNDP study in the context of the Arab region. It highlights that “the convergence of climate risk and situations of conflict and displacement is rising to the top of the agenda globally and in many countries in the Arab region” (UNDP, 2018). Africa is also one witnessing a similar parallel as the Arab region. Burkea et al. (2009) highlight the fact that climate change has a detrimental effect on the population of Africa. This happens, because, a large chunk of the population resides in rural areas and heavily dependent on agriculture. Hence, climatic variations can have an impact on food production and its availability as the study says. Thus, the scarcity of food production is one of the main factors contributing to the conflict scenario. The study taking the African region as a broader geographical unit found that if the “temperatures increase from 1.0°C to 1.6°C by 2030” there will be “393,000 battle deaths by 2030”. On percentage term “this is an increase of 54% increase of conflict in the continent” (Burkea et al., 2009).

While studies suggest that climate change incubates societal conflicts, other studies also highlight that growing demand for energy across the world in recent years precipitate climate change. (Lkeme, 2003; IRENA, 2019; Ma, 1998) A National Aeronautics and Space Administration (NASA) study published in 1997 says “CO₂ emission has increased by 30 per cent since pre-industrial times ... and continues to rise over time, due primarily to the burning of fossil fuel” (Ma, 1998). The IPCC study confirms the above proposition as it highlights “in 2010, the energy supply sector was responsible for approximately 35% of total anthropogenic GHG emissions” (IPCC, 2018). At the same time, IRENA in its research has also reiterated the IPCC report. It states that “energy-related carbon dioxide (CO₂) emissions have increased 1.3% annually, on average, over the last five years” (IRENA, 2019). One may underline here that shifting “energy dependence” from coal to oil and gas has contributed significantly to the “decline of CO₂ emission” (Ibid; Ma, 1998). The Energy Information Administration (EIA, 2019) has also

highlighted that “Global CO₂ emissions from coal use declined by almost 200 million tonnes (Mt), or 1.3%, from 2018 levels” (EIA, 2019). The same study has also highlighted that because of a successful transition, some of the traditional polluters, such as the so-called advanced western advanced countries, have reduced their emission as the data shows from “emissions declined by 1.2%” (Ibid). It also appreciated India’s efforts to stabilise the carbon dioxide emission due to the “shift” towards renewable energy (EIA, 2019). On the other hand, China is emerging as a major consumer of global energy is also the major emitter of CO₂, it emitted more than “4%” in 2018. This is happening largely because of the increase in the consumption of oil, gas and coal thus contributing to climate change (Carbon Brief, 2019).

Some of the above studies, highlight three important points, that need consideration while studying the impact of climatic hazards on ensuring societal security. These are “limiting the climate change level to 1.5°C or 2°C below” as per the suggestions given by IPCC 2018 (IPCC, 2019). Second, to reduce the dependency on fossil fuels and shifting to renewable energy and finally, also, reducing social vulnerability that includes harnessing of energy more sustainably. It is in this context; one has to strategise on how to checkmate the mitigations associated with these two major fronts namely climate change and energy transition (Bridge et al., 2013). Studies show that the colder regions are more susceptible to climate change due to the release of two poisonous gases namely methane and carbons as it holds them on a larger-scale. With the rise of temperature, the two poisonous gases release them into the atmosphere at a faster rate which in turn contributes to climate change. The intensive energy exploration in the colder region also contributes a lot to the process (Demek, 1996). Understanding the climate and energy linkages and ramifications for societal security, the United Nations General Assembly in a resolution in 2012 affirmed “2014-2024 Decade of Sustainable Energy for All”. To quote further:

“The resolution stressed the need to improve access to reliable, affordable, economically viable, socially acceptable and environmentally sound energy services and resources for sustainable development. In conclusion, it also highlighted the importance of improving energy efficiency, increasing the share of renewable energy and cleaner and energy-efficient technologies” (UN General Assembly, 2012).

The above resolution of the U.N has to be studied in the context of “energy poverty”. It may be underlined

here that “accessibility”, “affordable technology” and “energy distribution” are some of the factors which accentuates “energy poverty”. This is important in the context of Eurasia as despite rich in energy resources, this region is facing the endemic nature of “energy poverty” in multiple forms such as health security, food security, etc (Bouzarovski and Petrova, 2015; Van et al, 2014). Thus, any study on climate change and energy transition should focus on “energy poverty” as it gives a holistic perspective to the sustainable energy transition.

Another major aspect that needs special attention while examining climate change is irregular rainfall, which also contributes to aridity along with floods. This puts stress on societal security. As per the IPCC 2018 study, “the population under water scarcity increased from 0.24 billion (14% of the global population) in the 1900s to 3.8 billion (58%) in 2000” (IPCC 2019). The same study highlights that because of climate change, the intensity of irregular flood is increasing across the globe. Even scientific data suggests the same. For instance, in 2010, heavy rainfall occurred around the world to the tune in 26% of the increase in rainfall (Lehman et al., 2019). This had severe impact on both loss of human life along ecological disasters. Desmet et al. (2018) in their study highlight that “sea-level rise will lead to a drop in global real GDP of 0.19% in present discounted value terms and a displacement of 1.46% of the world population in 2200” (Desmet et al., 2018). Thus, a closed cyclical impact of climate change to some extent accentuated by energy security which puts the global commons at nadir is also being witnessed.

The normative framework as discussed above provides three distinct perspectives relevant to the present research. These are interrelationship between climate change and energy transition operates at different levels in a broader societal matrix. Second, the relationship between these two elements varies from society to society as the impact felt differently. Finally, “institutional mechanisms” for climate governance both domestic and international will have to play a crucial role in addressing the societal crisis emanating from these two variables as discussed above (Adger, 2006; Heubbaum and Biermann, 2015).

The Eurasian Experience

While looking at the Eurasian Region from the above-mentioned prisms there are certain geographical linkages also one can notice in Eurasia like the links between Volga River and the Caspian Sea. Similarly, the Altai region provides a common frontier in Eurasia, which brings the Siberian region into closer contact

with Central Asia, particularly with Kazakhstan. While delineating the climatic conditions of Eurasia and the nature of energy transition, it is worthwhile to examine the climatic variations in Eurasia regions as discussed above to determine its intensity along with implications on “sustainable security” (Sato and Nakamura, 2019; Groisman and Soja, 2009; Hill and Gaddy, 2003).

Siberia and Far East

It may be underlined here that similar to Arab region, the Eurasian states are also facing the catastrophe because of climate change. Exploration of hydrocarbon reserves in some parts of Eurasia such as Caspian and Siberia regions are also accentuating climate vulnerability. Arctic and Siberia are such regions of Russia facing the intensity of climate change (Kelmelis, 2011; Mohapatra, 2019; Hill and Gaddy, 2003; Mohapatra, 2018). The severity of the problem was also acknowledged by the Russian government report titled “National Action Plan: The first stage of adaptation to climate change for the period until 2022”. The report said that since “1970, the average temperature of Russia increased by 0.47°C for 10 years average”. On the other hand, it highlights that the “average global temperature rise for the same period was 0.18°C” for the same period (Government of Russian Federation, 2019). One interesting aspect of the report is that the Russian government has finally accepted the grim reality of climate change. The report emphasised a “comprehensive action plan aimed at reducing the level of climate change risks” and called it a “national security crisis” (Ibid). However, it may be underlined that climate change has certain positive aspects for Russia. This is more so in the Siberian and Far East region, as ice is melting at a faster rate, it is facilitating the exploration of energy which is benefiting the country. At the same time, it has some negatives consequences also. Irregular flood, loss of agricultural land, large-scale migration of population from other parts of the country because of the industrialisation process are some of the problems that Siberia and the Far East are facing (Troianovski and Mooney, 2019; Hill and Gaddy 2003; Mohapatra, 2018). This region is more exposed because there is a rapid rise in temperature than in comparison to other parts of Russia (Telegraph, 2018). This can be gauged from the recent report of Arctic Monitoring and Assessment Programme (AMAP), which works under the Arctic Council. The report gives some glaring pictures regarding the severity of the climate conditions in this part of Russia. It adds that in “January 2016 in the Arctic was 5°C warmer

than the 1981–2010 average for the region, a full 2°C higher than the previous record set in 2008, and monthly mean temperatures in October through December 2016 were 6°C higher than average for these months” (AMAP, 2017). The rising temperature has also put stress on permafrost which contributes to as scientist Turetsky (2019) and his colleagues in their study found, will release around “100 billion tons of carbon by 2300”. It has also been observed that the burning of the permafrost is also responsible for an erratic flood which in turn puts stress on natural vegetation, depletion and diversion of seas, etc (Ibid). As discussed above, the energy industries are major stress factors for climate change. The same can also be seen in the case of Russia especially in the regions of Siberia and Far East. United Nations Framework Convention on Climate Change (UNFCCC), 2018, also highlights that the energy sector contributes to the largest emission. It further adds that in “2015 Russia’s energy sector emitted near about 78.86% greenhouse gas emission” (Kozin, 2020). Similarly, the CDP Carbon Majors Report 2017 emphasises that Gazprom is the second-largest emitter of greenhouse gas emission after Saudi Armoco since 1988. The same report also mentions that the Russian coal sector is also contributing to the emission thus affecting climate change. Thus, from the above analysis, it is clear that major energy sectors which are located in the Siberia and Far East creating havoc thus affecting climate change (CDP Carbon Major Report, 2017).

While climate change is taking place in Siberia and the Far East due to the emission of poisonous gases from energy sector, the same is going to have an adversarial bearing on the social structure (Kelmelis, 2011). A study by anthropologist Susan A Crate, titled “Climate Change and Human Mobility in Indigenous Communities of the Russian North” particularly in the context of Saka community highlights the major impact of climate change on human society are “(1) warm winters; (2) cool summers; (3) lots of rain and at the wrong times; (4) land remaining underwater; (5) lots of snow; (6) more floods; (7) extreme temperature changes; (8) seasons arriving late; and (9) fewer birds and animals” (Crate, 2016). Crate’s study also highlights its impact on the human community as most of them are moving to the urban centres for greener pasture; thus, affecting the rural economy (Ibid). Crate noted that the displacement of the Sakha community due to environmental catastrophe is creating a lot of “socio-psychological problems”, which include, adaption to a new lifestyle along with choosing a new occupational pattern. This is fostering wider social resentment and alienation

thus having an impact on the survival of the human community (Ibid). The Khanty community settled in the Western Siberian region is one such anthropogenic group that is also facing the fear of extinction. This is happening due to the large-scale settlement of the outsiders along with the negative consequences of oil industries (Wiget and Balalaeva, 1996). Studies also demonstrate that large-scale emission from oil and gas industries including coal extraction industries are going to effect the natural vegetation process which includes the survival of reindeers. It has been argued that these reindeers are going to determine the “food basket chains” of the region. Over some time, if this process continues, climate change may aggravate the survival of the traditional communities due to loss of food chain (Siberian Times, 2018; Kelmelis, 2011, Mohapatra, 2019). For instance, the impact of climate change has accentuated the irregular flood in some of the rivers of the Siberian and Far East region, which also contributed to a massive impact on the human settlement on the river banks. The flooding of the Lena river in May 2018 also had a devastating effect on population settlement in Yakutia in which the river flows (Siberian Times, 2018). Because of climate change the number of viruses dormant over the years is reappearing. The so-called “Siberian Plague” is making a reappearance in the Arctic part of Russia. Because of the spread of the virus, “2,000 reindeer died and 96 people were hospitalised” (Telegraph, 2019).

The recent oil spill which occurred in the Arctic part of Russia is only aggravating the ecological crisis in this region of Russia. As reported “more than 21,000 metric tons of oil-spilled into the river Ambarnaya”. The sensitivity and gravity of the situation can be understood from the fact that Russia declared a “national emergency”. Though the Russian government stated that they prevented the flow of oil spill to the Arctic Ocean still, there is a grave threat to the flora and fauna along with its impact on the human community (Moscow Times, 2020).

Thus, the Arctic and Siberian regions of Russia are providing a blueprint of how climate change and energy security are interacting with each other, therefore, shaping the dynamics of societal matrixes. It may be underlined here that one major factor which is accentuating the environmental problems is that over the years this aspect got minimal attention both during the Soviet period and in recent years too. Because of the sparse population in the region, the policymakers at Moscow failed to gauge its impact on social structure. However, due to growing public

consciousness and progressive legislation by both central and regional governments efforts are also going on to address the issues of climate change and social vulnerability at a greater depth. A balance should be maintained between mitigating the negative effect of climate change along with ensuring “sustainable socio-economic development” (Vincent, 2019; Hill and Gaddy, 2003; Mohapatra, 2019). The Siberian and Arctic region experiences can also be visible in other regions of Eurasia.

The Caspian Experience

Similar to the Siberian and Far East regions, the Caspian Region is also facing the daunting task of coping to the climatic crisis along with balancing the need for energy exploration. Scientific studies in and around the Caspian region highlight that climate change is affecting the shrinking of the sea level because of “precipitation and evaporation” (AGU, 2017). The American Geophysical Union, in its study shows the decline in the Caspian Sea is quite alarming alongwith the scientific data between 1995 and 2015 demonstrate the decline is “nearly 1.4 meters (4.5 feet)” (Science Daily, 2017). A similar study from the United Nations Environmental Programme (UNEP) published in 2010 has also highlighted the impact of the phenomenon of climate change on the Caspian Sea. The report stated that “climate change and fluctuations in the water levels of the Caspian Sea and coastal habitats are constantly changing and biodiversity is declining” (UNEP, 2011). Another important aspect in the context of the Caspian Sea is that in some parts of the Caspian Sea the sea level is increasing, which is putting an equal amount of stress on the human community. This is more evident in the Kalmykia and Dagestan regions of Russia where the sea level is increasing at a greater intensity in the last couple of years. This may also have an additional impact on agricultural land and its productivity (Kosarev and Kostianoy, 2005).

The decimation of the Caspian Sea is also impacting both human and ecological systems such as “flooding and growing desertification and displacement of human settlement” (UNEP, 2011). As observed by the Ministry of Ecology and Natural Resources of Azerbaijan in its report published in 2010, “because of shifting of sea-level Azerbaijan is experiencing large-scale flood, especially in the coastal region.” The study estimates “Azerbaijan loses around 18-35 million dollars annually because of the natural disturbances” (Ibid). It specially mentions that “climate change” in

the Caspian region can be attributed to the “energy sector”. For instance, Organisation for Economic Co-operation and Development (OECD) states that “energy accounts for about 83% of Turkmenistan’s greenhouse gas emissions 35% of which were emitted as unintended seepage” (OECD Turkmenistan, 2019). The same is true for Kazakhstan also. The oil industries of Kazakhstan are releasing around “800 million tonnes of gas” putting “severe stress on the climatic conditions from its refineries in Atyrau and Mangystau” (UNEP, 2011). A UNEP report published in 2009 shows that “The accumulation of hydrocarbons, heavy metals and other toxins associated with oil and gas poses serious environmental threats to the sea by negatively impacting biodiversity and habitat, and by causing overall degradation of the environment. These threats, in turn, pose economic and security dangers” (UNEP, 2009). Like the Arctic and the Siberian region where the rare species, for example the reindeer are at the edge of extinction, in the Caspian region also some of the rare fish breeds such as “Kutum and Aurata and Caviers” are facing the same fate. For instance, in the Ataryu region of Kazakhstan known for its oil exploration native people allege that due to spillage from oil industries, the redfish and other sea species are dying (Kashkooli et al., 2017; Tengri News, 2019). The above-mentioned UNEP study highlights that because of irregular flood in the Caspian Sea region, there is a catastrophic impact on both ecology and society. In the Kalmyk region of Russia located at the Caspian Coast, more than “10% of the population has migrated” because of irregular floods and its impact on human life (UNEP, 2011; Nadim et al., 2006). In the Kazakhstan part of Caspian, most of the oil fields, particularly in the Atyrau and Mangystau regions, are confronting the problem of flood, which is affecting the oil fields and also the human settlements (UNEP, 2011; Nadim et al., 2006). Because of climatic change, large parts of Azerbaijan is also facing the problem of both irregular flood and drought which has a devastating impact on society. The severe impact of climate change which Azerbaijan is confronting can be substantiated from the UNDP study, which says “water shortage is to the tune of 23% up to 2050” (UNDP, Azerbaijan, 2019). Environmental degradation due to climate change has put the population of the Caspian Region in a more vulnerable position and the same is also reflected in their HDI ranking. As per 2019 HDI data of these states, Kazakhstan ranked 50; Azerbaijan stood at 87; Turkmenistan ranked 108 and Russia’s position was 49. Even though these states are endowed with natural resources such as oil and gas are accruing

huge profits by sellings at the international market. What one infers from the above statistical HDI data is that the benefit of energy resources has not been translated to benefit the common masses which is contributing to social vulnerability (UNDP HDI, 2019).

A closer look at the Caspian states’ experience with regards to climate change demonstrates that similar to Arctic and Siberian regions, it is also facing massive ecological disaster, which, in turn, accentuating is social conflict. The conflict between ethnic Kazakh and workers from Jordan and Lebanon over a minor issue, later turned into a major conflict, is a pointer in this direction. The local workers alleged that they are being “mistreated” as low wages are being offered to them by the Tengiz oil company. This reflects the growing resentment among the local population. Though this minor incident is nothing to do with climate change, however, it mirrors societal vulnerability and apprehensions from the local population about their societal security (Yergaliyeva, 2019; Mohapatra, 2018).

One major factor which is heightening the above-mentioned problems for the Caspian states is the transitional socio-political system and their Soviet legacy which to a great extent is aggravating the problem. The studies show that the fluctuation of the Caspian Sea level started since then. Before the discovery of the Siberian and Arctic energy complex, this region used to export major chunk of oil and gas to the external market. In recent years, the need to explore more energy resources for earning foreign reserves without concerns for the environment can also be attributed as one major factor responsible for the harmful effect on the environment in these states. In addition to this, a lack of access to technology through which they can mitigate the harmful effects of environmental degradation and climate change is also generating acute stress for these states (Mekhtiev and Gul, 1997; Nadim et al., 2006).

There are three parallels one can draw in the context of both Arctics: Siberia and Caspian regions. These are climate change and its impact on seas along with natural vegetation. Second, the vulnerability of social groups in both regions. Finally, the oil industries are aggravating the crisis. However, in the case of Central Asia, the case is quite different.

Central Asia

While looking at the geographical positioning of Central Asia, one can notice variations as far as climatic impact is concerned. While Tajikistan, Kyrgyzstan and

Uzbekistan are facing the catastrophe of climate change, its impact can be visible in the form of shrinking of Amu and Syr Daya along with other smaller rivers so also melting of permafrost and glacier. On the other hand, both Turkmenistan and Kazakhstan face a double burden due to the Caspian Sea as discussed above. These variations along with their respective geographical locations are also facing climatic implications on society (UNEP, 2011; Mohapatra, 2014).

Studies show that on an average temperature has increased to 0.5% in all the Central Asian states (Central Asia, 2018). It has also been estimated that the temperature of this region “will increase up to 2.0°C by 2050” (Climate Links, 2018). The rise in temperature as discussed above has a potential impact on glaciers located in Central Asia. A World Bank Study in the context of Central Asia says, “20 to 30% glaciers are melting every year” and this has contributed to recurrences of flash floods throughout the region. This took a heavy toll in terms of declining economic activities “which is around 1.3% annually” along with societal consequence (World Bank, 2014). However, the moot point is that any disruption of glaciers located in the above-mentioned mountainous ranges, of Kyrgyzstan and Tajikistan will have a serious impact on energy production. The rise in temperature will to a greater extent have also an adverbial effect on hydroelectricity projects and accessibility to the same in Central Asia. For instance, in Turkmenistan, it is going to affect to the tune of 13%, in Kyrgyzstan by 19% and Tajikistan which depends on around 98%” on hydroelectricity sector (Reyer et al., 2017; Tajikistan Hydropower; UNECE Tajikistan, 2017). It may be recalled here that Uzbekistan is one of the largest producers of energy in the post-Soviet space and as per an EIA study, it occupies the 3rd position in terms of gas production in this region at the same time, there is also a significant amount of foreign investment (EIA, 2016). However, in recent years understanding the significance of the renewable energy sector it is also trying to diversify its energy sector. To reduce its dependence on Kyrgyzstan and Tajikistan, the Uzbek government is also mooting for nuclear energy to generate electricity. In the context of transition to renewable energy. Tashkent is planning to produce around 30gw by 2030 (Energy Global, 2020; Mohapatra, 2014; Stucki and Sojamao, 2012). The shift towards renewable energy by Uzbekistan can be understood in the context of growing acrimony with both Tajikistan and Kyrgyzstan for securing electricity (Ibid). It is necessary to underline here that the impact of

climate change is going to have a deeper impact on the Central Asian societies as evident from the scarcity of water resources, which is confronting these states over the years. A different type of conflict one is witnessing in this geopolitical space is rooted in “scarcity”, “accessibility” and “distribution of resources” among these states. The “climate-energy nexus” is also posing a deeper impact on food production which in turn has a detrimental impact on “sustainable security”.

Studies also suggest that because of climate change, the monsoon cycle is being affected and this, in turn, has an impact on the water crisis followed by crisis in agricultural productivity. This is a good example of the syndrome of “energy poverty”. As per a study of the Food and Agricultural Organisation (FAO), around 66% of Kazakhstan’s land area is facing desertification (FAO, 2017). A similar study by World Bank says that scarcity of water resources is going to pose a major problem in the Central Asian states “as more than 30% of the total population” is dependent “upon agriculture”. Also, in the context of Tajikistan, the study says that “production from agriculture will drop by 30%” (World Bank, 2018). It has also been observed that: “extreme weather can, directly and indirectly, undermine physical safety, health and food security. There is a risk that climate change will ignite protest as unmanaged transition and impacts destabilise livelihoods and social security can provoke powerful social discontent with far-reaching security consequences” (Central Asia, 2018).

Like the Arctic and Siberian parts of Russia, what one witnesses in Central Asia is the fear of pandemics looming large because of climate change. A group of scientists recently published a paper highlighting the relationship between “climate change and proliferation of plague”. The study highlights that: “a 1°C increase in spring is predicted to lead to a >50% increase in prevalence. Climatic conditions favouring plague existed in this region at the onset of the black death as well as when the most recent plague pandemic arose in the same region. They are expected to continue or become more favourable as a result of climate change” (Stenseth et al., 2006).

The rapid rise in temperature will also have an impact on the ecosystem which in the longer-run may exacerbate social conflict at the local and regional levels. For instance, the water scarcity in Central Asia along with perennial conflict between two upstream countries, Tajikistan and Kyrgyzstan and three downstream countries such as Uzbekistan, Kazakhstan and Turkmenistan are impacting the conflict situation of the

region. Similarly, the shrinking of the Aral Sea is has a catastrophic impact on the social structure of this region as it fuels social dislocation along with food and health crisis in this region (Dalbaeva, 2018; Mohapatra, 2014; Stucki and Sojamao, 2012). Ecological catastrophe is one of the moot factors propelling social conflict in the Ferghana region. The severity of climate change-related conflict is more pertinent in the context of Ferghana Regions which crisscrosses borders of three countries namely, Uzbekistan, Tajikistan and Kyrgyzstan. Demographic pressure and scarcity of land along with a competition to get scarce resources on an “identity matrixes” are responsible for the volatility in this region. In this regard, one can cite numerous instances of ethnic conflicts among Tajik and Uzbek, Kyrgyz and Uzbek over the competition to get scarce resources such as water (Baker, 2011; Stuckii and Sojamao, 2012; Mohapatra, 2014; Janes, 2010). These conflicts were manifested towards the fag end of the Soviet Union and are continuing in a more intensive form in recent years. The construction of Rogun dam of Tajikistan and Kambarta dam by Kyrgyzstan is further heightening the water crisis for Ferghana. As a retaliation, Uzbekistan is also not supplying gas to these states in winter which they need most. This is an incubating crisis for the entire region (BBC, 2016; Mohapatra, 2014). As per an EIU study, Tajikistan supplies near about 30% of electricity to Uzbekistan (EIU, 2018).

It may be recalled here that despite producing hydroelectricity both Tajikistan and Kyrgyzstan are facing some form of energy poverty. This is widely visible in the rural areas of these two states. For instance, the Khaton region considers being the most impoverished region of Tajikistan is facing considerable problems in accessing electricity. Because of the inadequate supply of electricity, it affects the day to day life of the local community in the region. Despite stupendous progress in providing electricity to the local population still there are certain concerns particularly providing electricity in the Winter session. Another major hurdle that Kyrgyzstan’s electricity sector faces is poor infrastructural development which contributes to loss of electricity (Laldjebaev and Kassam, 2017; World Bank, 2017).

It is necessary to underline here that the impact of climate change is going to have a deeper impact on Central Asian societies as evident from the scarcity of water resources which is confronting these states over the years. A different type of conflict one is witnessing in this geopolitical space rooted in “scarcity”, “accessibility” and “distribution of resources” among

these states. The “climate-energy nexus” is also posing a deeper impact on food production which in turn have a detrimental impact on “sustainable security” (Mohapatra, 2018). The social vulnerability of Central Asia can also be partly attributed to climate change. The growing migration and social vulnerability to some extent are also contributing to the proliferation of radical and terrorist groups like the Islamic Movement of Uzbekistan (IMU) and ISIS as studies suggest. As observed, these terror groups are recruiting cadres into their fold by taking advantage of socio-economic vulnerability of local population in Central Asia (Action against Hunger; Sharifzoda, 2019).

In totality, one can add that Central Asia provides a new prism to the interaction between climate change and energy. Here the conflict is more on renewable energy and energy poverty which is accentuating the societal conflict. The same can also be witnessed in the context of the South Caucasus and Baltic Region.

South Caucasus and the Baltic Region

The horrendous effect of climate change is also felt in the South Caucasus region. Akin to the Central Asian region, both these regions are facing more or less similar problems. Similar to the two Central Asian states, Kazakhstan and Turkmenistan, Azerbaijan, being one of the Caspian states, is also facing a double burden. It has been observed that the problems associated with the negative impact of climate change are similar to that of Central Asia. All three Southern Caucasus states are experiencing an increase in temperature, which demonstrates that climate change is also undergoing in this part of the world (Ahouissoussi et al., 2013). As per the Ministry of Nature Protection of Armenia of the Republic of Armenia (MONP) 2015, it has been observed that the temperature is going to increase “1.3–1.7°C by 2040, 2.6–3.2°C by 2070 and 3.3–4.7°C by 2100” (South Caucasus). In Armenia, climate change has a direct impact on food production along with the water crisis. Some of the major food producing regions such as Arthasat and Yeghegnadzor are suffering the worst kind of food crisis in recent years due to change in climatic conditions (Ahouissoussi et al., 2013). The impact of climate change can also be observed at the societal level, in the form of high unemployment rate particularly in the rural areas, where there is a high dependency on the agricultural sector. As studies highlight, the proportion of the population living in poverty in Armenia and Georgia is near about “32.0% and 14.8%, respectively (OSCE, 2017).

The Baltic region is also facing the worst impact of climate change in recent years. This is happening because the temperature in the Baltic Sea is rising. In this context; studies suggest that in the coming years this region will face the worst ever crisis, which will impact the local ecosystem. It has been observed that “the Baltic Sea is affected by the local meteorological conditions, which may cause an extreme sea-level rise and flooding” (CBSS, 2017). Comparatively in the Baltic states’ environmental record is much better than other post-Soviet states still, this region is confronting different kinds of environmental problems. It has been attributed that the lack of diversification of energy security and effective energy mix are some of the factors which is complicating the environmental problems (Strandmark, 2015; Baltic Eye, 2019).

Regional Cooperation Mechanisms

Problems currently confronted by Eurasian states are with regards to climate change; social vulnerability is not recent or happening since 1991. Rather, it predates the formation of the Soviet Union. The need of the hour is how to tackle the crisis which is posing an impending threat to Eurasia. One aspect that needs to be highlighted here is that these states are not capable of handling the situation except Russia. Even some issues concerning climate change affect global commons. For instance, the crisis of the Arctic cannot be resolved without involving other Arctic powers such as the US, Canada, Norway, Sweden, etc. Similarly, the issue of the Caspian Sea cannot be resolved without Iran. Though in recent years, the Arctic Council and the Caspian Summit of Heads of States are playing a role to address the issues (Carbon Brief, 2015). Along with this, some of the hydrocarbon-rich states such as Russia, Kazakhstan, Turkmenistan and Azerbaijan evolved a coordinated institutional mechanism known as the “Teheran Convention” since 2003 to address the issue more comprehensively and sustainably. Article 4 clause b states that “individually or jointly take all appropriate measures to protect, preserve and restore the environment of the Caspian Sea” (Teheran Convention, 2003). The Environment Ministers of the Caspian Region recently through a virtual meet in June 2020 stressed upon the need to “strengthen cooperation on regional environmental monitoring and assessment, scientific research, biodiversity protection and to curb pollution within the instruments of the Tehran Convention and its Protocols” (Caspian Environmental Information Center, 2020). Efforts are also going on to

revitalise the Central Asian Power System which came up during the Soviet period for energy distribution. In recent years, the Asian Development Bank is providing financial assistance to the tune of \$ 35 million to revitalise the energy corridor titled “Reconnection to the Central Asian Power System Project” (Putz, 2018; Khosla and Abena 2015). The Baltic states have also taken several initiatives to mitigate climate change and ensure energy transition. The Baltic Sea Region Climate Change Adaptation Strategy, which the Baltic Sea littoral states (in addition to three Baltic States) have initiated to “address the sustainable management of the Baltic Sea in the context of climate change” (BALTADAPT). Along with the above regional mechanisms, some of the above-mentioned states of Eurasia such as Kyrgyzstan, Kazakhstan, Russia, Uzbekistan, Turkmenistan, Tajikistan, Latvia, Estonia, Lithuania and Armenia have already signed the Paris Agreement. This provides them an opportunity to synergise their strategy towards climate change and energy security transition within the global framework. In future, the Paris Agreement will provide them an opportunity to address climate change more effectively (Paris Agreement, 2015).

One needs to underline here that though the Eurasian states are confronting the crisis of climate change and energy security crisis and initiated several institutional mechanisms to address them, so far, they have not been quite successful. The major problem, which they confront over the years as the literature suggest, are lack of access to technology, resources and transitional problems which these states are confronting over the years (CAREC, 2018). It may be recalled that Russia, Kazakhstan and Baltic states can address these problems efficiently. In addition to existing “distrust” towards each other among these Eurasian states are also impeding fruitful cooperation. For instance, Tajikistan and Uzbekistan are at loggerhead with each other over the sharing of hydro-electricity. Though international institutions such as World Bank, IMF and ADB are trying to intervene, but it is not adequate to address the multiple problems the Eurasian region is confronting over the years (Bespalov, 2019). The righteous way is developing a strong institutional regime to address the above-mentioned trajectories impeding the sustainable security in this region.

Discussion

After analysing the correlation among climate change, energy security along with social vulnerability in the context of Eurasia, three major inferences one can draw

here which is going to provide a structural framework to the present study. These are:

- (a) Geographical locations along with climatic variations are going to influence the “anthropogenic structure” of Eurasia.
- (b) Growing activities associated with energy exploration and its distribution are impacting the pattern of climate change. This can be observed from both the energy-producing regions of Caspian along with Arctic and Siberia. On the other hand, the Central Asian region is currently facing the devastating impact of climate change largely due to the rise of temperature which is a global phenomenon.
- (c) The mismatch between rapid climatic changes along with inadequate societal response in the form of adaption is accentuating social vulnerability. This is manifesting in the form of societal conflict and migration as happening in this region.
- (d) The problems for the Eurasian states are compounding largely due to lack of access to technology to mitigate climate vulnerability along with financial resources. Even some of the energy-producing states of Central Asia and other Caspian states are also not able to bargain effectively with transnational energy corporations.

Conclusion

The present study delved on three conceptual frameworks confronting, the global commons in general and the Eurasian Region in particular, in the form of climate change, energy security and societal vulnerability. The excessive harnessing of natural resources such as oil, gas and water resources is impacting on climate change in this geopolitical space. Though the problems confronting the Eurasian states can be explained in three straight jacket frameworks as discussed above, however, the impact is felt differently in different regions of Eurasia. While studies show Baltic states are better adapted themselves to the impact of climate change in comparison to other regions within Eurasia. This is because no such major energy exploration is going on in this Sea in comparison to the Caspian Sea and the Arctic. Second, the Baltic states being part of the EU are also able to get technological assistance which facilitated their smoother energy transition. On the other hand, the problems for Russia's Siberia and Arctic regions and also, the Caspian region are quite different. In both regions, one can witness that climate change, energy security and social vulnerability are influencing

each other. As discussed above, directly or indirectly, the energy exploration in both the Sea basins is also contributing to climate change and the meltdown of permafrost as in the case of Siberian and Arctic regions. At the same time, as studies show because of climate change, there is fluctuation in the Caspian sea level which in turn is putting a stress on ecology. The societal structure also suffers a lot in terms of displacement, declining agricultural productivity, etc. Excessive energy exploration is also responsible for the release of poisonous gases which is putting stress on the climatic conditions. The negative consequences of climatic conditions is quite severe in both the Central Asian and Caucasian regions, which is also affecting the flow of rivers. As a result it is impacting the hydroelectricity production. Similarly, the Caucasian region is also being affected by irregular floods occurring largely due to the impact of climatic conditions. In nutshell, one can add here that exploitation of natural resources such as water and energy reserves along with rising sea levels are some of the trajectories responsible to a greater extent for climate change in Eurasia. However, one common element that can be underlined here is that its impact is being felt at the societal level. As has been observed, the indigenous communities are also at the receiving end in Arctic and Siberia. This is affecting their “societal identity” as studies highlight. A similar impact one can witness in other parts of Eurasia. As discussed above, taking advantage of social vulnerability of the communities affected by climate change in Central Asia and the Caspian Region, the radical groups, are also luring few of them into their fold. This is posing a security threat to both the regions of Eurasia.

One major handicap the Eurasian states are confronting in recent years is that despite facing a common challenge that is, climate change these Eurasian countries have also yet to develop a common multilateral forum in the form of an “institutional regime” that can provide assistance to them in the form of financial assistance and technology which they need most. What the Eurasian states need at the present moment is initiating a multilateral regime framework that can address the issues of climate change and energy security for ensuring a “sustainable security” in the region.

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