



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Understanding The Complexities Of Climate Change And Energy Security In Russia- A Move Towards Sustainable Development?

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Abstract: A country dependent on energy resources for its economic growth, with ambitions of becoming an energy superpower, Russia aims to move towards a sustainable future. However drunk with its past glory of having a superpower status, its unsolved geographical and historical disputes with the former Soviet Republics and the ideological tussle with the West, it becomes difficult for Russia to fulfil its sustainable economic development goals. On the one hand, Russia seeks to stabilize its economy through its energy resources, on the other hand however, the resources are scarce and there is a need for it to become an energy efficient country with sustainable development goals. To top it all, the Western sanctions on Russia due to its territorial ambitions involving the annexation of Crimea and the invasion of Ukraine, it is interesting to see how and whether Russia has tried to bridge the gap between its ambitions and the harsh reality, as climate change has been haunting Russia in unimaginable ways.

Keywords: sustainable development, economic growth, climate change.

I. Introduction

The global economy is seen to be progressing at a very high rate with countries competing with each other to raise its GDP and to strengthen and stabilise their economy. However with the growth in economy there is also a rise in demand for more energy resources. There is a vicious cycle of demand and supply of energy resources involving various countries. However although the demand may continue to depend upon the economic stability of a given country, the supply of many resources is limited. The world is aware of this scarcity of resources but this vicious cycle has been continuing. We are yet to see a complete depletion of resources however we do see the negative results of the exploitation of such resources in the form of climate change and various other environment and ecological degradation. The countries today are facing grave ecological imbalances and health hazards. If the process of exploitation of resources continues in the same spree then our future generation will be left with problems of environment and scarcity of resources; being deprived of all the benefits that we enjoyed. Hence there is a need for sustainable development where the economy of a country continues to grow but the environmental problems and the scarcity of resources are under check. For a country like Russia who is a developing economy dependent on energy resources, there is a need for balance in their aspiration to become global energy power and to understand the complexities of climate change.

The international environment treaty United Nations Framework Convention on Climate Change (UNFCCC) was negotiated at Rio de Janeiro from 3 to 14 June 1992 and came into force on 21 March 1994 with the objective to stabilise the greenhouse gases (GHG) to a level that would “prevent dangerous anthropogenic interference with the climate system” (UNFCCC 1992). It is under UNFCCC that the Conference of Parties or COP is held annually and so far there have been 21 such conferences. The Kyoto Protocol extended the 1992 UNFCCC. It was accepted in Kyoto, Japan on 11 December 1997 and entered into force on 16 February 2005. However since the first Conference of the Parties (COP) in 1995, greenhouse gas (GHG) emissions have ascended by more than one-quarter and the atmospheric concentrations of these gases have increased steadily. Although COP 15 held in Copenhagen failed to achieve a binding treaty, it did succeed in bringing about a consensus to bring the global average temperature below 2 degrees Celsius, and to take necessary actions to reduce emissions which would be undertaken by both developed and developing countries. It also made a commitment of a hundred billion dollars per year of public and private climate finance to developing countries by 2020, mainly through the Green Climate Fund (International Energy Agency 2015: 18-19).¹ The Conference of Parties (COP 21) in Paris led to the adoption of the Paris Agreement among various countries after two weeks of talks and three weeks of intensive negotiations. The major features of the Agreement outlined by French Foreign Minister and COP21 President Laurent Fabius are as follows:

1. It takes into account the differentiation and responsibility of developing countries, and their respective capacities in light of national circumstances.
2. It confirms the key objective of containing mean global temperature rise well below 2 degrees Celsius and to endeavour to limit it to 1.5 degrees Celsius (AnanthaKrishnan 2015).

The COP 23 held in Bonn, Germany dealt mostly with negotiations of countries on the details of the Paris agreement and how to make it work from the year 2020 onwards. Climate change was once again the major area of concern and was placed at the core of global diplomacy. This conference drew the attention of various countries as this was the first meeting after the announcement of US President Donald Trump to withdraw from the Paris deal (Timperley 2017).

Russia's attitude towards climate change is intertwined with its energy security and its economy. On the one hand it knows the ill effects of climate change and on the other it also knows that its economy is heavily dependent on energy and there will be obstacles that it will face in the functioning of its economy by adapting to the climate change policies. This can be understood by Putin's views on climate change. At the International Arctic Forum in Arkhangelsk, Putin did agree to commit to Paris Climate agreement but also agreed with the opinion of Finnish President Sauli Niinisto regarding the inevitability of global warming. He also mentioned that for Russia climate change works favourably in some ways especially with regard to the melting of the Arctic ice as it creates more possibilities for economic improvement and that ten percent of his country's GDP is correlated to the Arctic region (Meredith and Cutmore 2017).

However climate change is haunting the entire world including Russia and it's a fact that cannot be ignored. Therefore Russia has taken initiatives to deal with the problem of climate change and the environment hazards attached to it, and plans to work on climate change adaptation strategy. Russia's Ministry of Environment officials have asked its regional officers to assess the impacts of climate change as well as to come up with measures to resolve them by giving them a deadline somewhere in mid 2018. Only six regions out of 85 including Moscow and St Petersburg were able to report any form of progress. Permafrost thawing has occupied one of the top priorities in the environmental problems faced by Russia. Russian government has also been adjusting its 2020 climate change action plan by giving extra importance to permafrost thawing (Climate Home News 2017). Russian government has also realised that the focus should be on prevention of negative impacts rather than spending huge amounts in eliminating them. According to the Ministry of Environment, the estimate of the annual severe weather conditions affecting Russia had cost it almost 500 million dollars to even 1 billion dollars leading to the average annual loss of 1.2 percent in its GDP until 2030 (Liza 2017).

¹ Green Climate Fund (GFD) comes under the framework of United Nations Framework Convention on Climate Change (UNFCCC) and was established during the 2010 United Nations Climate Change Conference in Cancun. It assists the developing countries to counter climate change.

The Western sanctions on Russia have not affected the cooperation between Russia and the Western countries when it comes to climate change adaptation strategies. Russia has been working with United States and United Kingdom to combat the problem together. Russia's Service for Hydrometeorology and Environment Monitoring (Roshydromet) and the US National Science Foundation have been working together successfully in at least two projects and almost ten projects between them range from oceanographic to permafrost research (Sputnik news 2017). Russia has also been cooperating with United Kingdom as scientists from both the countries discussed the menace of climate change at a round table event at the British Ambassador's residence in Moscow on 24 November 2016. The aims of such meetings have been to draw their attention to climate change impacts as well as to highlight the scale of such effects on the environment. Through the help of UK Foreign and Commonwealth Office (FCO) funded Russia-UK projects, Russia is helping to go forward with the climate change related adaptations and policies that will further contribute to CLICC (Country Level Impacts of Climate Change) initiatives that help countries to correspond their climate change and susceptibilities in a concrete but transparent manner (British Embassy Moscow 2016).

The Russian invasion of Ukraine has impacted the environment of both the countries negatively. The ecosystems and economy of both Russia and Ukraine have faced a backlash. The war has affected the economies of not just Russia and Ukraine but has affected the functioning of the global market. The outbreak of the Russia-Ukraine war has made many countries change their oil and gas suppliers, involve in the building of infrastructures for liquefied natural gas as well as involve in a wide range of energy projects like investing in new fossil fuel projects (Davydova 2023).

Russian policies towards climate change are still insufficient, even though the war has affected the ecosystems and energy markets of both the countries involved. In fact, in the recent COP27 Climate change conference in November 2022 and the COP 15 biodiversity conference in December 2022, Russia's official agenda clearly did not reflect the effect of its invasion of Ukraine on its climate and biodiversity (Ibid).

De-greening of legislation is often common during the war periods and this is evident in the case of Russia as well. The countries in war often tend to cancel or relax different environmental standards and requirements. This is because the countries involved want to focus on reducing business costs (Simonov 2022). However various environmental groups and other civil society associations have continued to show their concern over environmental problems despite the government apathy towards it. One such example is an overview of the environmental problems and the trends related to its degradation, published by the Russian Socio-Ecological Union (RSEU), Russia's largest environmental association in May 2022 (Ibid). A 2020 survey conducted by Levada Centre shows that a vast majority of the Russian population regard environmental degradation as being worse than international terrorism and as the biggest threat to humanity. Almost 48 percent agreed on this view, followed by 42 per cent of the population that regard international terrorism and 37 per cent that consider wars as being the greatest threat to humanity (Conley and C. Newlin 2021).

However on the other hand, it is not that the Russian government has completely neglected environmental policies as they continue to legislate on matters related to climate and carbon regulations. Along with this, new projects involving experiments on the Far East island of Sakhalin to become carbon neutral by the end of 2025 are also being launched. Russia is also of the view that it has been working on green diplomacy since the time of its annexation of Crimea and the resultant sanctions on it. It has therefore been quite actively involving in the environmental aspects of international collaboration (Davydova 2023).

Despite Russia's claims that it has been working on green diplomacy and other environmental problems, it has failed to achieve the desired targets in many of its environmental related goals. According to the Climate Action Tracker (CAT), an independent scientific analysis, Russia's policies, targets and finance are "critically insufficient". This report by CAT indicates Russia's minimal to no actions taken with regard to climate change and is thus not in agreement with the Paris Agreement's temperature limit of 1.5 degree Celsius (CAT, 2022).

II. Impact of Climate Change In Russia

As the countries of the world compete in terms of raising their economic standards and are caught in the cycle of demand and supply of resources, they are also facing a huge threat of climate change and associated environmental problems. These environmental threats are of concern to all the countries of the world but for countries whose economy depends on either demand or supply of the energy resources are caught in a tight spot. Russia is a major global actor in the sphere of energy. The largest exporter of natural gas in the world, with the world's largest gas reserves, whose own energy security depends to a certain degree on the security of exports (Sharples 2013: 683). Russia has also been facing the effects of climate change as scientists believe that it has been warming at a rate of 2.5 times faster than the other country, with its temperature rising by 0.42 degree Celsius per decade since 1976. A Russian government report released in December 2015 raised apprehension to such trends as it could hurt energy infrastructure in the country (Salo 2015). Russia's prime concern has been the melting of ice covered regions due to increase in temperatures, which in turn brings greater problems for Russia in the long run as it disrupts the ecosystem.

Global warming and permafrost thawing:

Russia has been facing extreme weather changes over the years especially in the Arctic region. According to weather experts and politicians, weather events have doubled in the past 25 years. Rise in temperatures in Russia has been of major concern, and as stated by Boris Revich, head of the Russian Academy of Sciences' environmental health laboratory, the year 2010 saw grave effects of such rise in temperatures. Almost 44 days in the summer of 2010 there was extreme rise in temperature, leading to forest fires and smog and resulted in almost 1100 deaths in the Moscow region (Davydova 2017). The year 2016 was supposed to be the hottest year on record according to the World Meteorological Organisation with global temperatures measuring 1.2 degrees Celsius above pre-industrial levels (Carrington 2016). The year 2016 therefore witnessed extreme changes in the weather events affecting almost the entire world as especially the Arctic regions with some parts of Arctic Russia soaring to six degrees Celsius to seven degrees Celsius above the long term average (E360 Digest 2016). Temperatures have been rising and setting new records and the year 2017 was seen as the hottest year on record in Russia (Sharifulin 2017). There are several factors that add to the rising of the global temperature and natural factors like El Nino is considered to be one of them.² Although 2017 was recorded as the second hottest year on record according to NASA data, it can be regarded as the hottest year on record as it was without an El Nino event (Nuccitelli 2018). In the year 2016, the El Nino event pushed the temperature higher, although the main reason for the record high temperature has been due to greenhouse gas emission caused by human activities (Carrington 2016).

Russian scientists are warning a multitude of threats that could be set free due to global warming encircling the frozen far north of the country (The National World 2016). The Russian scientists state that temperatures are increasing in the colder regions of Russia like Yakutia compared to the rest of the world and the rate of their increase is twice the global rate (Liesowska 2015). The Government's disaster monitoring department had informed in 2011 that Russia's massive permafrost may shrink by a third by the middle of the century due to global warming. This would be a matter of great concern to Russia considering that 63 percent of Russia is now enclosed in permanently frozen soil (Lubin and Badkar 2011). One of the worst effects of global warming has been the thawing of the permafrost which in turn brings other forms of environmental hazards. The warming and melting of the frozen ground could affect the infrastructure such as pipelines, roads and buildings of Russia as almost two thirds of its landmass come under the permafrost zone (Liesowska 2015). The term 'permafrost' refers to any subsurface materials that remain below 0 degrees Celsius for at least two consecutive years. The permafrost occupies 25 percent of land area in the Northern Hemisphere, of which about 16.7 million square kilometres is located in north eastern Eurasia and 10.2 million square kilometres in North America (Anisimov and Reneva 2006:169). Global warming is indeed detrimental to Russia with the permafrost covering 25 percent of the Northern hemisphere and more than 60 percent of that of Russia.

² El Nino is a natural phenomenon that originates in the Pacific and leads to the rise in the global temperature due to the release of heat from the ocean to the atmosphere. La Nina is regarded as its counterpart that drags down temperature (Pidcock 2017).

The thawing of frozen ground due to rise in temperatures may shift balance between uptake and release of carbon in Tundra leading to emission of greenhouse gases from the carbon rich arctic wetlands. Degradation of permafrost may lead to huge alteration of terrain, hydrology and vegetation, and may eventually lead to transformation of existing landforms. The Arctic is extremely susceptible to climate change, with major impacts anticipated in physical, ecological, sociological and economic factors (Ibid). The climate models have predicted up to eight degrees Celsius temperature rise in Yakutia also known as the Sakha Republic which is due to reduction in snow and ice cover and also due to the Arctic getting additional sunlight. A map of Yakutia from 1884 is already changing and is different to one from today, with several Arctic islands disappearing due to coastal erosion. However Professor Oleg Anisimov from the State Hydrological Institute in St Petersburg says that melting ice across the Arctic will better the conditions for navigation along the Northern Sea route, but stressed the continuing need for ice breakers and coastal infrastructure to support it (Liesowska 2015). The thawing permafrost can affect global warming further through the release of greenhouse gases. Arctic soils contain roughly fourteen percent of the global soil carbon and deeper thawing and high soil temperatures will augment decomposition of the organic material and emission of greenhouse gases, whereas longer growing season and northward movement of productive vegetation are likely to increase photosynthetic carbon uptake (Anisimov and Reneva 2006:174).

The effects of climate change has been devastating in all the parts of the world and especially in a place like Russia where the permafrost has been melting through the centuries leading to a situation where in almost two thirds of Russia's gargantuan landmass may turn into swampland which will have devastating consequences on the livelihoods and infrastructures of Russia (Wheeland 2015).

Effects on health and ecosystem:

Climate change in Russia in terms of the rising temperature resulting in the thawing of permafrost can lead to many serious environmental hazards disrupting the ecosystem and causing health and other livelihood problems. The most dangerous consequences of climate change are linked to natural phenomenon such as floods, melting and disappearing of glaciers, landslides and mudslides, drought, heat waves, cold period, rising sea levels and coastal flooding as well as the spread of disease carrying insects that carry tick borne encephalitis malaria. In summer of 2010, thousands of people died in Russia due to heat wave, combined with smoke from forest and peat pyres, ground level air pollution and the release of ozone and other pollutants from photochemical reactions (Safonov 2013:154).

The Arctic region is more prone to climate change as the coverage of the sea ice has been reducing by nine percent every decade thereby substantially increasing the river runoff, for example the run off of Volga river increased by 15 to 40 percent (WHO 2009). According to the World Health Organisation estimates, present climate changes cause about 150000 premature deaths in the world and 55 million disabilities a year (0.4 percent of total disability). In the case of Russia itself about 1000 people die annually because of floods, storms, typhoons and hurricanes while the number of people with traumas and post trauma shocks is unknown (Revich 2008:311). One of the worst floods occurred in the city of Lensk in 2001 when an enormously cold winter caused an unequalled spring thaw flood. This resulted in the melting of glaciers in the upper stream of the Lena River. It was further aggravated by heavy rains. The level of water rose highest in the history of Lensk by 2.0 to 2.5 metres. The Lena flood therefore endangered the delivery of vital services for sanitation and health for over 38000 residents in Yakutia between spring and August in 2001. There was huge damage incurred to city infrastructure, water sources for industrial and domestic needs as well as contamination of drinking water. It also caused the destruction of petroleum reserves in the city leading to the spilling of 9000 tons of petroleum into the river Lena (Revich et al 2008:8). In December 2015, the uncharacteristic rise in temperature led to the flooding of ice skating rinks of the Russian capital with water thus blocking the start of the ski season there. One of the main Christmas attractions, a seven metre high, and a hundred metre long ice slide melted in central Moscow just four days after its opening (TASS 2015).

Climate change can alter the functioning of the ecosystem and cause ecological degradation. With the rising temperatures and global warming taking place Russia has been encountering the rise of serious health problems. There has been a strange anthrax outbreak in the distant corners of Siberia affecting the health of many families. The place where the outbreak has taken place is the Yamal peninsula which is like a giant freezer thus providing

good conditions for the bacteria to remain alive. The real reason for the outbreak is still being investigated but the in progress theory suggests that the warming up of the surface led to the melting of the thin layer of permafrost that covered the carcass of the reindeer that had previously been infected with the anthrax bacteria and hence the outbreak happened. In the 20th century, there were recurring anthrax outbreaks in Siberia and more than a million reindeer had died with over 7000 burial grounds with infected carcasses scattered over northern Russia (Doucleff 2016). It was said that the reindeer used to be vaccinated against anthrax but this program stopped a decade ago. The scientists warn similar outbreaks in the coming years (ABC NET NEWS 2016). According to Viktor Malayev, the deputy chief of Russia's Central Research Institute of Epidemiology said that apart from the spread of anthrax, there are a plenty of other dangers lurking in shallow Arctic graves which might be unlocked from the ice after centuries. He also said, "We had small pox graves" in the far north at the end of the nineteenth century and scientists are discovering new giant viruses in mammoths (The National World 2016).

The thawing of permafrost can be of severe threat to the structures built upon it. Several large cities such as Yakutsk, Norilsk and Vorkuta, with population of more than a hundred thousand and large river ports are located in the permafrost regions. A survey in the Russian northern cities indicated that in 1992 the percentage of damaged buildings were 10 percent in Norilsk, 22 percent in Tiksi, 35 percent in Dudinka and Dikson, 50 percent in Pevek and Amderma, 55 percent in Magadan, 60 percent in Chita and 80 percent in Vorkuta. In the period from 1990-1999, the rate of reported damage to buildings increased by 42 percent in Norilsk, 61 percent in Yakutsk and 90 percent in Amderma (Anisimov and Reneva 2006:172-173).

Apart from the Anthrax outbreak, there are some other health problems that are associated with climate change. These health problems include, hemorrhagic fever with kidney syndrome which has increased more than three times since the mid 1980s; Crimean hemorrhagic fever that are mostly registered in the southern regions of Russia; and Nest Nile fever which is caused due to mosquitoes as climate change improves their habitat³ (Revich 2008:315). The health distress is rising because of the environmental problems associated mostly with the increase in temperature and thawing of permafrost. To forestall and address potential dangers from environmental change to health, the project 'Shielding wellbeing from Climate Change in the Russian Federation' looks into the health impacts and their susceptibility and adaption to environmental change. On the basis of this project the World Health Organisation in cooperation with the Northern Medical State University in Arkhangelsk, organised a first workshop on building capacity to assess vulnerability and adaptation to climate change in the region in September 2009. It aims to build capacity in climate change and health by engaging a number of stakeholders to provide ownership and sustainability, and allowing risk management (WHO 2009).

However there are many of the opinion in Russia that climate change can also be viewed from a positive angle depending on the benefits it brings to the people at large but the benefits are mostly short terms and are bound to create more problems in the long run. Many Russians believe that a number of these effects will be positive in that there will be the opening of northern sea routes as well as shortening of winter thus saving heating costs. Although the Inter-Governmental Panel on Climate Change agrees that some benefits of this kind can be expected, negative impacts like forest fires and damage to the northern infrastructure may take place mostly because of the melting permafrost (Korppoo 2009:9). According to the researchers at the University of Illinois, global warming could increase Russia's arable land by 37 to 67 percent. This would also add 425,000 square miles of farmland- an area three times the size of Montana (Lubin and Badkar 2011).

The World Wide Fund of Russia released pictures of government weather station that is about to topple into the sea. Alexander Aleynikov, a glaciologist states that since 2009, over 70 metres of coastline has eroded. The small island of Vize in the Kara Sea is disappearing at a fast rate as the Arctic sea ice and the Russian permafrost is melting due to the increase in temperature (King 2016). The rise in temperatures has already affected the ecosystem of the Barent Sea which borders the peninsula to the north as well as part of Norway. According to Alexei Ezhov, a researcher at Murmansk Marine Biology Institute, the western colonies of birds such as 'Kittiwake', the 'Guillemot', and the 'Razorbill', are degrading and can completely disappear

³ In 1999, there was an outbreak of Nest Nile fever in Volgograd and Astrakhan oblasts. About 394 and 95 were hospitalized respectively. The outbreak occurred because the year was the warmest year in the 20th century.

(Bozhkova 2014). Apart from birds, other wildlife organisms have also been affected by climate change. Lake Baikal which is the world's deepest and oldest lake, and home to a phenomenal ecosystem comprising numerous species, has undergone dramatic warming and ecosystem changes that could disturb its biological system. Since 1892, winter temperatures in the region have warmed 0.3 degrees Celsius per decade, making it one of the rapidly warming regions of the world. This increase in the temperature can be threatening to its fish and other aquatic creatures (Climate Hot Map- Global Warming effects around the world).

There are other changes that are altering the ecosystem in Russia including Russia's bears not going for hibernation, rabbits turning white but without snow (which makes them easy target for hunters) and birds not taking flight to warmer places as the signal for their flight is when rivers and lakes freeze (Vendeyeva and Komsomolets 2014). Although there might not be a direct effect but climate change is indeed changing the patterns of the ecosystem which may cause ecological imbalances in the long run. However there are opinions that the changes in the ecosystem might be beneficial for Russia, for example in the case of fishes in the Barent Sea. According to the researchers at the University of Tromso in Norway, melting sea ice allows more sunlight to reach marine phytoplankton making the sea fertile and fertile water would attract more fish although it is unclear as to whether the cods that are among Norway's most important species would swim off to Russia or not⁴ (Clark 2013).

Although Climate change can bring some benefits to Russia, the colossal negative impacts of climate change on the ecosystem of Russia will definitely outdo the positive ones. Climate change is a major concern for Russia and sooner the actions are taken by the government and concerned officials the better it is for the people and the environment they live in. Many scientists have already contemplated that global warming could be partly responsible for the series of unexplained craters appearing throughout the Yamal region⁵. They believe warming air is thawing thick permafrost, leading to the build up and release of volatile 'fire ice' gases which then explode to create the giant funnels (Liesowska 2015). The sooner the government takes measures to safeguard the environment there will be better ways to fight against the ill effects of global warming. However the government in their quest to exploit more resources there hasn't been much interest towards dealing with global warming and climate change. The President of Russia, Vladimir Putin on one of the occasions has even said, 'two or three degrees' of global warming would in fact be better for Russia because this will lessen the expense incurred on the fur coats to beat the cold. This statement shows the callous attitude of the Russian officials towards such grave issues. After the Chernobyl disaster in the year 1986, the seriousness of the country could be seen at least in theory when the concerned officials brought forth strong environmental principles in their constitution. The real test will be to bring those principles into practice (Wheeland 2015).

Russia's Energy Security and Efficiency amid the Effects of Climate Change

Russia has the world's biggest natural gas reserves and the eight largest oil reserves making it the world's largest exporter of natural gas, and the second largest oil exporter. According to the United States Department of Energy, the oil and gas sector generates more than 60 percent of Russia's export revenues, and accounts for 30 percent of all foreign direct investments in the country Russia is currently the third largest energy consumer and is also the world's third largest emitter of greenhouse gases (GHG) in absolute terms, accounting for a share of around 6.2 percent of the global GHG emission in 2004 (Chiavari and Pallemerts 2008:4-5). An important change in the energy sector from 2014-2015 has been the speedy drop in world oil prices and to lesser extent, natural gas and coal prices (International Energy Agency 2015:22). Over the past two and a half decades, global carbon dioxide emissions increased by more than 50 percent. While emissions amplified by 1.2 percent in the last decade of the 20th century, the usual annual rate of increase between 2000 and 2014 accelerated to 2.3 percent. However after the fall of almost 30 percent in emissions from Russia in the early 1990s, the emission increase thereafter has been limited (Ibid: 27).

⁴ Cods in the Barent Sea are shared between Norway and Russia under an agreement between the two countries dating back to the 1950s (Clark 2013).

⁵ In 2014, the discovery of a sinkhole in Yamal peninsula caught the attention of the world media. There have been various theories to explain the cause of sinkhole/crater including the theory of a UFO hitting the earth. However scientists explain it to be due to the explosion caused by excessive pressure due to the concentration of methane in the bottom of the sinkhole (Moskvitch 2014).

For Russia, energy security is perceived to be a political concept as the political value of Russia's gas export to the European Union (EU) and other regions lies in Russia's role as a provider of energy security to them. Although energy security has been represented as a consumer centric concept, for Russia like any other energy supplier energy security is more about the security of demand (Sharples 2013:685-686). According to the Russian State Statistics Service (Rosstat), the Siberian Federal District contributed 11 to 12 percent of Russia's GDP in the period between 2000 and 2012. In absolute term, Siberia's gross regional product in 2012 was around 5.1 trillion roubles. The vast majority of this production was in some ways related to mining, manufacturing and other industries that consume natural resources and have an impact on the environment (Safonov 2013:102). Climate issue in Russia has not gained a high profile on the national political agenda. One of the reasons is probably the fact that climate change is still regarded by many Russians as not being a serious environmental problem compared to other countries. However as mentioned earlier in the paper, Russia does show certain vulnerabilities such as permafrost thawing, flooding as well as other environmental hazards (Chiavari and Pallemmaerts 2008:1).

Russia's economic development is to a large extent dependent on its hydrocarbon based fuel and energy complex. Russia has about 6 percent of proven global oil reserves and 24 percent of natural gas deposits. Historically extensive exploitation of oil and gas reserves has entailed massive damage to Russia's natural environment including pollution from oil spills and flaring of associated gases (Knizhnikov 2013:39). Under the Soviet Union, the development of resource potential became a state priority and the scale of confiscation of resources from Siberia reached great proportions especially in sectors such as coal mining, oil and natural gas production. It should also be kept in mind that during the Soviet era the principles of sustainable development had yet to be developed (Safonov 2013:101).

The Arctic Fossil Fuels resources is of attraction to all the major economies of the world and are therefore involving themselves in the competition to gain control over these resources. This is done by measures such as claiming new territories or building new infrastructure in harsh environments. Russia for obvious reasons is among those competitors and its latest move has been to set up a huge plant that will extract liquefied natural gas (LNG), which will work towards its dream of becoming the biggest exporter of the chilled fuel, and thus overtaking Qatar which is currently lading the market. The plant is expected to extract 16.5 million tonnes per year by the start of 2019. This move by Russia may fulfil its ambitions in the energy and economic sector but will lead to major environmental setbacks. Various analysts at the global think tank Centre for European Policy Studies (CEPS) warn that Russia's 'Ostrich approach to phasing out fossil fuels and its denial of the human origins of climate change' could be a cause of grave climate change globally (Furturism).

While climate change has negative impacts in the environment, it has been a source of great opportunities for countries that come under the Arctic Council, which are Canada, Russia, Norway, Denmark, Finland, Iceland and the United States. The water routes that were otherwise covered in ice have now been open to these countries and these countries have started to claim for their respective territories. Russia and Denmark have already submitted their territorial claims in the year 2017 and accordingly the United Nations will determine which country will get what in the year 2018. The Russian minister for the environment and natural resources stated in 'The Daily Telegraph' last year that the country seeks for 'recognition of exclusive economic rights to about 460,000 square miles, estimated to hold 5 billion tonnes of hitherto unexplained oil and gas'. While the countries strive to claim territories and to plan out ways to exploit the resources available there, they should bear in mind the consequences attached with these activities. Activities such as drilling for oil as well as carbon emissions can have adverse impact on the environment of the Arctic region. Russia has even increased its military activities in this area and according to the Henry Jackson Society, a UK think tank; Russia has almost 45000 troops, 3400 military vehicles, 41 ships, 15 submarines and 110 aircrafts in the Arctic regions. This is a sheer display of power to its neighbours and competitors (Flisiuk 2018).

The ill effects of global warming and climate change in the Arctic region can be seen in the form of flooding, coastal erosion, permafrost thawing, altered migration of both land and sea animals, and a shifting in vegetation zones. The indigenous communities of the region are the ones who will suffer the most because of the activities of the competitive countries in their never ending thirst for resources. The Russian scientist, Professor and member of the International Arctic Science Committee, states, 'It's important to consider how the Arctic is

connected to the world, and how climate change and economic interests are changing life for the people living there.’ (Ibid).

To understand Russia’s energy security in terms of the most serious global concern- ‘climate change’ and environmental problems we need to understand how Russia balances the issue of threats to energy security and threats to environment. Generally there is a trend to neglect the environmental issues by the countries, keeping it limited to paper and not in actions. In this competitive world the priorities of countries mostly lies in their need to rise as a global economic and political power. However climate change is an issue which cannot go unnoticed, therefore the countries of the world have come together to work in cooperation to fight the environmental threats. For energy dependent country like Russia, whether in terms of demand, supply or usage, it should be kept in mind that the needs are many, but the resources are limited. Therefore it becomes interesting to observe how Russia would contribute in saving the environment along with its aspirations to become an ‘energy superpower’.

III. Towards Sustainable development: need for ‘green economy’ and energy efficiency:

Discussions on sustainable development are taking a more concrete shape in recent years and the attention is increasing towards stimulating the development of ‘green economy’. This model of economic development based on the principles of sustainable development regards the full value of natural capital and environmental services and proposes environmental sustainability, social justice and the development of local production (Safonov 2013:105). The world is therefore progressing towards achieving sustainable economy and environment involving efficient use of natural resources, manufacturing and increasing natural capital, reducing pollution and lowering carbon emission as well as preventing losses to the ecosystem and biodiversity amongst other crises (Bobylev and Shvarts 2013:96).

To this end, ‘Sustainable Goals 13’ seeks for imperative action to fight climate change and its impacts. These goals are related to sixteen of the other goals of the 2030 Agenda for Sustainable Development. However in order for these goals to be achieved it is necessary to implement the Paris Agreement in its full capacity (Sustainable Development Goals).

The term ‘green economy’ was first coined in a pioneering 1989 report for the Government of the United Kingdom by a group of leading environmental economists entitled, ‘Blueprint for a Green Economy’. In 2008, the term was invigorated in the milieu of discussion on the policy retort to multiple global crises. In this context of global recession, United Nations Environment Programme (UNEP) championed the idea of ‘green stimulus packages’ and identified specific areas where large scale public investment could start a green economy (Allen and Clouth 2012:7). Despite the need for development and growth, countries today have understood the need to secure their resources for the future generation as well as the need to contribute towards a safe environment. The countries today are therefore looking for ways in which they could continue the cycle of demand, supply, and utilisation of resources along with working towards security of such demand and supply. Therefore countries’ need to focus on energy security together with the need to understand the consequences of massive development activities, the solution of which is seen to in sustainable development and ‘green economy’.

Although green economy has been incorporated in documents and policies over the last ten years, trends of green economy could be traced in the 1950s in Western countries when the focus was on ecology and resource efficiency advancing towards sustainable development. The situation was different in Soviet Union where the global energy crisis in the 1970s did not prevent its plan to export fossil fuels (Kiryushin 2014:7). However it was at the Rio+20 Conference, that Prime Minister Dmitry Medvedev stated, “Society economy and nature are inseparable. That is why we need a new paradigm of development, which is capable of ensuring the welfare of society without excessive pressure on the environment...and there must be innovative growth and growth of energy efficient, the so called ‘green economy’ which is unquestionably beneficial to all countries” (Bobylev and Perelet 2013:13-14). He adopted a number of legislative documents, including the 4 June 2008 Presidential Decree n.889 ‘On Certain Measures to Improve the Energy and Environmental Performance of the Russian economy’. This decree seeks reduction of the country’s energy intensity by 2020 as compared to 2007 levels and demand for resource efficiency (Kiryushin 2014:9).

The idea of sustainable development in Russia starting budding after the issue of the Russian Federation Government Order No 1522-r and dated 19 August 1992 that led to the establishment of Interagency Commission that aimed at putting into operation the resolutions of the United Nations Conference on Environment and development. The thorny transition period of Russia in the 1990s adversely affected the idea of sustainable development in the various areas including economic, environmental and social issues. The measures leading to sustainable development were not implemented fully and leading to a huge gap between theory and practice. However in the year 2002, there was a reviewing of the work on sustainable development in the 1990s, and thus the 'National Assessment of the Progress of the Russian Federation in its Transition to Sustainable Development' was prepared just before the World Summit on Sustainable Development in Johannesburg (National Report 2012).

Russia being the home to world's most important fisheries has adopted sustainable measures too in its various fishery firms. The Walleye Pollock fishery in the Sea of Okhotsk is one such example, and has earned the Marine Stewardship Council Sustainability certificates. Sustainability has also been achieved in Russia's forestry and almost 45 percent of Russia's land is covered in forest, which comprises 22 percent of the world's forest. The sustainable measures with regard to forestry has not achieved great success as compared to the fishery industry but the progress is worth noting as more than 33 hectares of Russian forests have already earned the Forestry Stewardship Council certification for proper forest management as well as the fact that the environment non-profit World Wildlife Fund Russia is partnering with Russian forestry companies and multinationals.

While the Russian government has taken initiative towards attaining sustainable growth and energy efficiency which would be environmental friendly, we should understand that these are just statements made by the officials and how well they will be implemented and followed is a challenge for Russia. However these policies also reflect government interest towards sustainable development. Green economy would also focus on the development of renewable resources and as Russia has vast sources of renewable energy, it has a great potential to work towards achieving 'green economy'. Almost all the regions of Russia have two or more forms of renewable energy that are commercially exploitable. First, there is a great solar energy potential in the North Caucasus, the Black and Caspian Sea region, and in southern Siberia and the Far East. Second, there are numerous areas where the annual wind speed exceeds 6.0 metres per second, particularly along the coasts of Barent and Kara Sea, the Bering Sea and the Sea of Okhotsk. Third, the smaller rivers amount to about 46 percent of total hydro energy potential and these hydropower resources are located in Central and Eastern Siberia and in the Far East. Fourth, Russia has grave potential for the use of biomass resources for power production and for generation of heat and electricity. Finally, geothermal resources are being used for using low temperature thermal energy for residential houses and production (Chiavari and Pallemerts 2008:10). A Government Order from 8 January 2009 stated that by 2020, the volume of production and consumption of electricity from renewable energy sources should reach 4.5 percent. Russian companies like RusHydro, Renova and Rusnano are also showing interest in the development of renewable energy utilisation (Kiryushin 2014:20).

Russia's steps towards moulding its economy and energy security on the lines of sustainable development covers not only environmental issues but also areas such as social welfare system, technology and manufacturing sector, education, culture, science as well as measures to bring about energy efficient technologies. Therefore if Russia is able to bring to practice the principles of sustainable development that it seeks to bring about, it will lead to economic transformation that will highlight the human potential too along with fulfilling the goal of environmental protection (National Report 2012). A recent study by World Bank found out that if Russia uses its energy efficiently then it can cut down on its energy consumption by 45 percent that equals to France's total amount of energy consumption. However the problem of energy inefficiency in Russia is quite high. It is true that oil, gas and coal produce 90 percent of the country's energy and they are also responsible for more than half of the federal government's budget. Russia's non fossil fuel energy is also running on the verge of being nonexistent keeping aside the nuclear power and hydroelectric energy (Wheeland 2015).

Conclusion

Although efforts have been taken to make a move towards achieving sustainable development through energy efficiency and green economy, there is still much to do keeping in mind the challenges faced by Russia. There is also a major gap between the official statements and its execution. For a country like Russia who is dependent on energy resources for its economic growth, it becomes imperative for Russia to undertake and follow policies to bring about sustainable development through energy efficiency and resource saving. The threat to Russia's energy security is not only in terms of depletion of resources and the issue of demand and supply of these resources but also climate change and environmental degradation which is a more serious threat. However looking at the positive side, Russia has vast sources of renewable energy as well as natural gas (Liquefied natural gas) thus putting it at an advantage of becoming the supplier of environmental friendly energy resources. With a little state support through subsidies and required actions (and not just implementing policies) Russia has a great potential in strengthening its economy as well as contributing towards saving the environment. Climate change is not a single country's problem but it's a global phenomenon and requires the cooperation of all the countries in tracking it through not just signing of petitions but also bringing about change in practice.

Russia's quest towards a sustainable and effective development still has a long way to go but this transformation of Russia into a green economy where both the environment as well as the energy requirements are met seems necessary at the present, in order for its economy to rise as well as for a better environment. With the pressure being felt after the economic sanctions by the West and the pessimism shown by the leading country like United States towards environment issues and sustainable goals, the environment issues could take a backseat in Russia too. In order to prevent them from happening Russia's transformation is also dependent on a strong economy and the cooperation from other countries as well, as environment problems is not the problem of a single country. It is of major concern to all the countries of the world and in such a time there is no room for pessimism or doubt with regard to the environmental problems. The race for resources and energy consumption by various countries of the world in order to build a stronger economy and thus to gain a powerful position in the world should not take a toll on the environment as some of the resources are limited and must be preserved for the future generation, which therefore calls for right form of energy security and a sustainable way to use them.

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