



**RESEARCH PAPER**

**A Jurisprudential Study of Climate Change and its Impacts on Pakistan**

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**ABSTRACT**

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The objective of this paper is to find out causes and impacts of climate change on Pakistan, as there have been many causes and reasons for the climate change, which have contributed to the gravity of the situation; some of which have historical roots, whereas, many are manmade as well as, due to mismanagement of resources and abundant use of technology. Internationally, global community has realized the gravity of the issue and collectively international community has started to work together through treaties, protocols and policies, which have developed few steps and mechanisms for dealing with the monster of climate change. The research is qualitative and descriptive in nature. Pakistan has also set up climate change policy at national level, with a dedicated ministry in this regard too. There have been many initiatives during the past decade or so, which are in right direction, yet a lot has to be done. This paper provides a jurisprudential analysis of different aspects of climate change and also recommends adopting proactive, scientific and sustainable climate policy emphasizing on responsible consumption, efficient usage of energy and water resources.

**Introduction**

Over a period of time, there has been a drastic shift from treating environmental issues casually to perceiving climate change as a global issue and security threat for all states, irrespective of their size, location and power. The world is witnessing developmental as well as, resource management issues; in which climate change has added new dimensions of food security, water scarcity and health issues, impacting quality of life of humans. Mismanagement and over utilization of natural resources coupled with unchecked use of industry and technology and hazardous dumping have also aggravated the problem. This issue is so big that a single country

cannot handle, it needs collective efforts and holistic approach by all the states. Pakistan is not aloof in this regard rather it is more vulnerable due to its internal instability in terms of economy, political and societal issues, security threats at borders and international relations with regional and global powers. The causes of climate change are many having distinct impacts on different aspects of human life. Pakistan being an overly populated country is facing many issues like shortage of food, water and other resources; extensive heat-waves, more floods and earth quacks as well as, droughts. Many of these are due to climate change patterns and need imminent, effective and proactive policy making and its implementation. In the year 2012, a national climate change policy was adopted to fight with this issue, which provided broader policy areas for the above and which further emphasized on liaison of all the national, regional and international stakeholders. This paper will jurisprudentially explore the indicators, causes and impacts of climate change in Pakistani context alongwith an overview of Pakistan's efforts in this regard. At the end few policy recommendations and solutions will be proposed. The paper will only stick to theoretical aspects and jurisprudential characteristics of climate change.

It is well established rule that excess of everything is bad. The excessive use of natural resources, unbound use of modern technology and unrestricted horizontal growth of cities and urbanization over the centuries have contributed to the peril of climate change, which is a phenomenon contributing to diversified human security and survival issues. The phenomenon is not any country specific, as it is affecting almost every country whether that is in America, Africa, Europe or Asia. Few coastal and underdeveloped countries are more vulnerable. Africa and Asia are more challenged due to conditions of the people living here, who are already undernourished (FAO Report-2015/Rome); there are more viral diseases, people are more water stressed; floods are rampant and agricultural produce is falling on yearly basis and desert are expanding due to non availability of water.

### **Climate Change**

NASA defines Climate change as, *"A broad range of global phenomena created predominately by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include increased temperature trends described by global warming, but also encompass changes such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather conditions"*. This climate change is resulting into global warming having harmful impacts on global climate system effecting biosphere, lithosphere, hydrosphere, cyrosphere and atmosphere. Dry regions are expanding due to change in precipitation patterns, crops are yielding less production, deforestation and droughts are rampant, which are creating multiple human security issues in the shape of floods, natural calamities, melting of glaciers and rise in sea levels coupled with extreme weather conditions. During the past 15 to 20 years, Pakistan has witnessed heavy loss of human life, livestock and crops long-with infrastructural damage due to climate change impacts. There is dire need to have updated data, modern scientific research and knowledge sharing at all levels to tackle the issue effectively and efficiently.

## **Literature Review**

There has been diversified literature on indicators, causes and impacts of climate change in Pakistan. For the purposes of clarity, the literature is divided into different subheadings as under:-

### **Climate Change Indicators**

Rasool, et al (2012) have provided a list of indicators and perspectives in Pakistani context generally and regarding Sindh province specifically, ranging from temperature variations, sea surface temperature to rapid glacier retreat and vulnerabilities of Indus river delta. Sustainable development is directly linked with the climate change and environment, as it cannot be achieved without addressing these issues. Following are major climate change indicators:-

- Water scarcity at almost all the major cities of the world and Pakistani cities are not different in this regard, as urbanization has impacted water resources.
- Decreasing land productivity due to weather change and changing weather patterns.
- Risk of more natural disasters like earth quacks, floods and tropical cyclones.
- Changing precipitation pattern
- Droughts in almost all the underdeveloped states.
- There is availability of water for lower periods
- Heat waves have become more frequent and intense.
- Natural disasters erupting due to weather have increased and extreme weather conditions are more evident.
- Smog is also one of the issues being faced by almost all the major cities of Pakistan, causing severe health issues for humans. As per, WHO 2016, around 34000 children die every year due to respiratory infections caused due to air pollution. Further, burning wood inside homes for cooking is also a major factor regarding pollution and heat (Ali et.al, 2021)
- Earthquakes are also hitting Pakistan off and on due to climate change and bad weathers (Naseer et. al, 2010).

### **Causes of Climate Change**

There have been many causes for climate change in Pakistan, some are due to our own negligence and lack of commitment to the cause and some are global and regional. The unchecked urbanization, deforestation and lack of political will to stop the violations in this regard, are few of the major causes. For Dr. Rasool, G. & Afzal, M et al (2012) Pakistan's vulnerability to climate change is primarily due to its hot weather and geographical location. There have been laws prohibiting damaging river banks for construction purposes, like 2002's River Protection Act in KP, yet the same is happening in the name of building infrastructure and new societies. This hinders the natural river

course and in monsoon season, we see floods everywhere. Our mega cities have become concrete jungles and this has negatively impacted the natural water flow, increased heat waves, shrinking of green areas and green belts and underground recharge of water level. Encroachment at the river beds and around sea shores is another cause for calamities in the emergencies and monsoon season. These all pose a great challenge to the National Disaster Management system and authority. One can say that the causes are mostly man made as well as, due to mismanagement. In short, following are the causes of climate change:-

- Greenhouse effect is one of the major causes of climate change.
- The intensity of Sun's energy being reached at the earth and its impacts on different systems of the earth has also been affected.
- Reflectivity and its affect have also changed the quantum of energy entering into Earth system.
- Changes in Earth's orbit
- Carbon dioxide content of the ocean is increasing, making the marine life difficult to survive and migrate from one place to another, impacting their population and different habitat conditions making their survival difficult
- Plate tectonics and volcanic eruptions are also unprecedented and frequent
- Ocean currents are more severe
- Less vegetation average on the land
- Global warming is increasing on daily basis making energy issues more and more and making life different and difficult for different species including but not limited to humans.
- Fossil fuels are contributing towards climate change
- Deforestation is another issue attached with climate change.
- Intensive farming
- Waste disposal into rivers, seas and hazardous dumping into the soil is also contributing into the phenomenon
- Mining
- Over consumption of almost all the resources, has affected the balance of resources and changed the life patterns.

### **Impacts of Climate Change**

For Shahid, & Dr. Adnan, (2021) agricultural based impact of climate change in Pakistan is very severe and drastic and corona virus will have further worse effect on economy. Climate change has impacted almost every aspect of human life, ranging from water, biodiversity, agriculture, social and economic aspects and health, to name a few. The consequences being faced by people, especially poor and living in under-developed as well as, developing countries like Pakistan are grave and disasters may lead to climate emergency within few years having impacts on human life like, food scarcity and security issue, public health issues, water security, rise in sea level, coastline indications, ultimately leading to major national security issue. The weather is changing and Pakistan

having more than 5000 glaciers in its Northern Areas, is witnessing drastic change in Northern life and life style due to melting of glaciers and change in temperature and Pakistan's geo-strategic location makes it vulnerable for the impacts of climate change. There have been different philosophies regarding causes of climate change in Pakistani context; one talking of this phenomenon being specific to Pakistan due to mismanagement and arid climate of Pakistan and this is usually proved through data and historical analysis; whereas, there is another approach which treats the phenomenon as a global concern and Pakistan, like other states, is experiencing it, having scientific studies behind this approach internationally. Whatever may be the case; it is important to understand that the issue is real and imminent and needs solutions. Pakistan is also suffering from the phenomenon GLOF (Glacial Lake Outburst Flood) in GB and AJK especially and other glacier areas generally. There have been floods of 2010 and 2014 which left devastating effects on crops, human life, agriculture and livestock. There have been increased heat-waves and urban flooding in Pakistan for the past two decades or so. Dr. Ashraf, M (2021) has identified two types of people who are vulnerable to the climate change challenges, one living in the most vulnerable frontlines and other who are outside that circle. But for him, both are affected in one of the other way. So, it is pertinent to note here that one more issue, which is being faced by Pakistan, is climate variability, which divides people into two groups; one living at the frontlines of such variability affected areas and other having no effect or concern when it comes to immediate impacts of floods etc. But, in the long run both people suffer, differently, one having direct suffering due to they being living there in shape of destruction of crops, houses and livelihood, while other having ripple down effect afterwards, like once there is reduction of agricultural produce in one affected area, the other are naturally has to face the food scarcity as was faced by Pakistani people in 2019-20. Generally, following are major effects of Climate Change i.e.

1. On Biodiversity
2. On Oceans
3. On Humans
4. On Weather

### **On Biodiversity**

Following are major effects on biodiversity:-

- Disturbance of the ecosystem and loss in the biodiversity
- Negative effects on cycles of plant reproduction
- Scarcity of resources like food, water, agriculture and wildlife
- Change in life habits of people
- Change in the ecology
- Change in migration cycles of animals and birds, making them vulnerable when it comes to their survival and living habitats.
- Disappearance of many species (plant and animals) and many species becoming endangered
- Reduction in the livestock and agricultural production

- One impact is more prevalent weeds, pests and other reptiles
- Balance of biodiversity is modified and threatened, which is making living conditions hard and survival difficult for many species.

### **On Oceans**

The climate change has also impacted oceans and marine life, in a negative and more dangerous way like

- Poles are witnessing massive ice and permafrost melting.
- Increasing sea level is creating problems for the coastal area residents, fishermen and sea life.
- Acidification of oceans, a great concern for the sea life and marine plants, has also been an imminent issue. The dumping of hazardous materials in the ocean and melting of glaciers, alongwith dumping of sewerage into seas, is creating life threatening situation for the marine life.
- Grave questions regarding the adaptability of sea shells and coral reefs have been raised over the past few decades, which need collective efforts on the part of humans to save these.

### **On Humans**

Humans, who are the main reason for the climate change, are also affected by the climate change and have been victims of weather change and unbearable heat-waves. This menace of climate change has following few impacts i.e.

- Climate change is directly effecting global economy
- Resources like energy and food are becoming scarce, which is another impact of climate change
- Population migration is leading to climate refugees, especially from the most affected areas and those areas which are more prone to changing weather patterns.

### **On Weather**

Climate change is actually drastic change in weather patterns and result into more severe heat and cold waves as well as, unprecedented rains, cyclones and higher water demands but lesser availability of water, which is making human life more prone to following:-

- More droughts and more rains at different places
- More and severe heat waves and unbearable weather patterns.
- Precipitations have increased in number and intensity
- There has been increase in natural disaster, such as, storms, wildfire, floods, earth-quacks and frost free seasons.

## **Policy Recommendations**

In order to respond to this issue of climate change, two most important methods are adaptation and mitigation. When we talk of adaptation, it requires policy interventions in water resources, forestry, socio-economic measure, health, agriculture and crop farming as well as, biodiversity; whereas, mitigation deals with policies and their implementation in town planning, transport, energy and waste management. In this regard, following should be done at all the levels i.e.

- (a) International Level
- (b) Regional Level
- (c) National Level

### **International Level**

Following should be done:-

1. International community should provide a platform and engage all to actively participate in climate preservation.
2. There must be sharing of and access to global environmental facilities to all, as well as, rigorous trainings and workshops must be conducted for under-developed and less developed states on regular basis.
3. The technology, which is internationally available as well as, capacity building mechanisms and opportunities, must be provided through different funds and programs, not just limited to Green Climate Fund and Clean Development Mechanism.
4. Role of major powers to ensure participation and positive contribution by all states.
5. Help to more affected regions/countries.

### **Regional Level**

There must be some sharing mechanism regarding data, information, techniques, equipments and expertise regarding ecosystems, biodiversity zones which go beyond one's boundaries and weather stations, at periodic intervals and on regular basis in the times of emergencies. This scientific data can be conserved and shared through following:-

- (1) Cooperation through regional associations and organizations.
- (2) Exchange of relevant and pertinent knowledge, like in SAARC Convention on Cooperation Environment
- (3) The technologies and approaches which are eco-friendly must be adopted as a priority.
- (4) Early warning programs must be effectively implemented in order to help the concerned state/s in preparations and management for quick, timely and effective responses and once damage is done, for rehabilitation purposes.

**National Level**

- (1) Raising awareness among masses and stake holders
- (2) Organizational and Institutional initiatives
- (3) Capacity building
- (4) Infrastructural development
- (5) Introduction of educational and training programs in educational institutions.
- (6) Making comprehensive environmental policy at both state and provincial level.
- (7) Adopting no tolerance policy towards climate change issues.

Floods, sea intrusion and drought are Pakistan's three biggest challenges and issues, which result into different other issues like health, displacement of population as well as, security issues regarding water and food. Our government has established Global Impact Studies Centre (GCSIC) with vision 2025. Pakistani policy makers need to sensitize the people regarding gravity of this issue and create a sense of ownership among masses, whether they are living at the most vulnerable zones or in those areas where the direct impacts of climate change outcomes are not imminent. This can only be done through scientific data, interest of NGOs and collaboration with different stakeholders including but not limited to religious scholars, academicians, local politicians, media and civil society. Once a Kenyan Nobel Laureate, W. Maathi said, that unless people are empowered, given information and understanding that the natural resources are their own and environment is for them, you cannot protect the environment. Pakistan also needs to make the people own the issue not for themselves, but for their next generations too. There is a dire need to make an effective action plan for the policies being made over the past few decades, so that there can be improvement in forests, river covers, recycling mechanisms and local ecology. Need is to look at the sustainability of different projects and their environmental impacts must be considered, rather than how mega they are. Billion Tree Tsunami Project, Clean and Green Pakistan Initiative are few which are bringing good results in this regard. Recharge Pakistan Program and construction of many small dams can bring further sustainability in this regards. There is also a dire need to adopt modern agricultural techniques and look for newer options of cropping in mountains and on other marginal lands. It is high time to grow climate smart and genetically modified crop varieties rather than sticking to same old types of crops, which are less resistant and less productive in these changing circumstances.

**Climate Change Policy of Pakistan**

Pakistan is not only the signatory of Kyoto Protocol (1998) but also of Paris Agreement (2015). Further, Pakistan is also willing to fulfill its international commitments in this regard. The Paris Agreement and Kyoto Protocol, emphasize on reduction in carbon emission by developed states and developmental assistance to underdeveloped and less developed states for increasing resistance against climate change. It must be noted that Pakistan is also among few states which adopted the SGD goals in this regard. Pakistan is also pioneer in setting up full-fledged National Ministry of Climate Change in 2012 as well as, National Climate Change Policy (NCCP) to address



all issues pertaining to climate change and making comprehensive policies, programs and action plans. The policy pertains to many aspects like, EIA (Environmental Impact Assessment), IEE (Initial Environmental Examination), CDM (Clean Development Mechanisms), technology transfer, sustainable climate development, capacity building, inclusion of this issue into curricula and presenting Pakistan's instance and efforts at international level, by providing comprehensive frameworks and plans in this regard. The policy is kept as flexible and living to meet the changing needs and requirements to fight against climate change issues. The policy also talks of different socioeconomic measures like gender issues and poverty in this regard. Capacity building and institutional development is at the core of this policy. The policy aims as making Pakistan climate resilient and boost the economy through avoiding calamities by making the issue of climate change at the priority and for the same purpose the climate change fund has been established alongside, public-private partnership and civil society's sensitization for funding and proper and effective implementation of policies through different much needed projects. There has been a National Climate Change Policy Implementation Committee as well as, Provincial Climate Change Policy Implementation Committee/s too, which are to meet biannually and submit reports. After 18<sup>th</sup> Amendment, provinces have been given autonomy to develop their separate climate change policies under the guidelines and light of NCCP. Even *Green Benches* at High Court level were established to adjudicate environmental related cases in Pakistan. *Asghar Laghari versus Federation of Pakistan* (2015) was a Lahore High Court case which challenged the violations of NCCP 2012 by the Government and the Court discussed the aspects of climate justice and its vision about water justice as a human right to access clean water. In 2017, Pakistan Climate Change Act was promulgated and updated National Climate Change Policy of 2021 further emphasized on low carbon emissions and more climate resilience. Following are some of the salient features of NCCP:-

1. Sustained economic growth is to be pursued.
2. Integration of different national policies which are inter-related with the climate change policy, for better results.
3. Promotion of mitigation through special focus on adaptation regarding gender sensitive issues and pro-poor policies.
4. Water, energy and food security is to be ensured.
5. Risk minimization during floods, drought and other calamities, is another aspect of this policy.
6. Climate change needs effective decision making at all the ministerial level, so policy emphasizes on better coordination in this regard.
7. When it comes of using the financial facilities at both national and international level, the policy reiterates about its effective controls and management.
8. Adaptation measures cannot be achieved unless there is investment by both public and private sectors and this aspect has not been neglected in the policy.
9. Policy is very clear on the agenda of capacity building of all stakeholders through trainings and skill workshops etc.
10. Long-term sustainability and conservation of resources (natural and national) is also a hall mark of this policy.

## Conclusion

The issue of climate change is unprecedented, unpredictable, uncertain but real, which poses threats which are not traditional and historical, hence decision makers are not accustomed to their solutions. The already risk prone regions (politically, strategically, security wise and economically) are more vulnerable to the impacts of climate change, due to internal and external instabilities and Pakistan is among those states, which is to face more security risks than many other states of the world. The out of box solutions and proactive policy initiatives are necessary and imminent to handle the issue of climate change properly and with least destruction, as to some extent destruction is inevitable. It is stated that Pakistan is suffering from *Climate Injustice*, as Pakistan is situated at the most affected areas in this regard. This climate injustice demands, not only proactive and effective policy making and implementation at national [emergency] level, but also consensus of all the stakeholders like political leadership, environmental experts, state institutions and civil society on one point agenda i.e. to save the country's next generation from the worst impacts of climate change. The problem is unique, grave and imminent, hence it demands unprecedented steps at war like preparations, and otherwise next generation will not forgive us for the damage done to the environment and climate and for the negligence on the part of state machinery in this regard. This negligence is not simple one, rather it is criminal negligence which not only needs solutions adopted by the international community but also thinking out of the box. A single nation of state cannot tackle this problem, it is an issue of each and every human and only holistic and collective efforts can bear some positive outcomes and fruits. The damage has already been done by the human greed, unchecked industrialization, wastage of resources, scientific experiments, dumping of hazardous materials, unbound urbanization, deforestation and destabilization of animal and plant life misbalancing the equilibrium. Now it's high time to stop destruction of climate in the name of modernization and technology. It is dire need to adopt climate friendly architecture; machinery and technology to bring things at normal or at-least slow down the further damage. Pakistan is more prone to urbanization and non-environmental friendly technologies; there is need to make stringent policies to curb this conversion of green land into so called societies, in the name of 'life style' and luxury. We are committing suicide and are killing our next generation with our own hands. The water and plant scarcity, unbearable heat waves and floods and natural calamities are bigger threats for Pakistan than the enemy at the other side of the borders. There is climate variability phenomenon too being faced by Pakistan, which needs protection, reassessment and proper management of resources and climate smart action. Data availability at both national and international level, alongwith it's sharing with all the stakeholders is a key in this regard to at least lessen the devastation and losses. There is no next time in this regard, as it is now or never for Pakistan, when it comes to the climate injustice.

Barrack Obama once said, "*All across the world, in every kind of environment and region known to man, increasingly dangerous weather patterns and devastating storms are abruptly putting an end to the long-running debate whether or not climate change is real. Not*

*only it is real, it's here, and its effects are giving rise to a frighteningly new global phenomenon: the man-made natural disaster"*

### **Recommendations**

NCCP (2012) has been very instrumental in this regard and has jogged down comprehensive list of mitigating factors, vulnerable ecosystems and capacity building mechanisms. In short, following can be major solutions in this regard, to be adopted by the world generally and Pakistan specifically:-

1. There is dire need to promote the usage of renewable energies and for that purpose access and use of solar panels, biomass and wind as well as, geothermal ones must be made available and used.
2. Usage of energy and water efficiency be the first and foremost priority
3. Sustainable transportation must be adopted, in order to avoid wastage of resources in this regard.
4. Planning should be done to go for sustainable infrastructure
5. Sustainable agriculture and forest management, needs to be the at priority by the state policy makers, even an agricultural emergency should be declared and projects like billion tree must be rigorously adopted and given patronage at all level.
6. Responsible consumption and recycling must be adopted.
7. There must be continuous awareness sessions for youth in educational institutions and all sorts of media; so that general public must be sensitized towards the gravity of the problem of climate change and general public at individual level must be able to play their positive role in reaching sustainable and attainable solutions in this regard.
8. State has to work with targeted audiences in small groups, like students, farmers and fishermen etc. and further has to use effective communication tools like both electronic and social media, brochures, pamphlets, SMS, seminars in schools and educational institutions, and issuance of booklets.
9. Usage of public transport must be encouraged, by providing state of the art facilities in the transport, to avoid emission of toxic materials through reduction of number of cars on the roads (Shahzad, 2015).
10. There is need for good governance in this regard, as policies and laws have been made, the problem is of implementation and allocation of resources and their usage in the right direction.
11. Water problem can only be solves, if water reservoirs are made and dams are built (GOP, 2012).

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