

## CLIMATE CHANGE IN PAKISTAN: THE EFFECTS AND COUNTERMEASURES

**Dr. Muhammad Awais**

*Associate Professor, Department of Business Administration, Foundation University School of Science & Technology, Pakistan*

**Dr. Qaisar Ali Malik**

*HOD - Business Administration, Foundation University School of Science & Technology, Pakistan*

**Dr. Omar Khalid Bhatti**

*Associate Professor, School of Business, Istanbul Medipol University, Turkey*

**Dr. Waqar Haider Hashmi**

*Industry Analyst, Fauji Foundation Head Office, Pakistan*

### ABSTRACT

The aims of this study are to highlight the extent of change in climate in Pakistan, discuss the vulnerabilities and recommend counter strategies. In this regard, literature review is carried out to examine as to what has been done so far to cope with climate change and what is the level of maturity of thought and dialogue in the country in this regard. To collect latest updates and key insights, online discussion sessions were carried out with climate experts to collate their impressions of the prevailing situation in the light of historical developments and to present their recommendations to cope with the problems imposed by climate change in the country. Video-clippings of the online discussion sessions were transcribed and careful analysis of the discourse is carried-out. A two-pronged mitigation strategy to counter the threats posed by climatic change in Pakistan has been recommended by the climate experts i.e., adaption and moderation. Adaptive techniques that can be deployed are rainwater harvesting, tree plantation, green agricultural practices, by creating awareness and improving and enhancing mechanisms for protection of environment. Whereas mitigation measures include use of renewable energy, protection and expansion of forests, more efficient and productive use of fossil fuels.

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### 1. INTRODUCTION

The Special Report on the Ocean and Cryosphere in a Changing Climate (2019) prepared by Intergovernmental Panel on Climate Change (IPCC) highlights that there is a 1.10°C of global warming due to human activities. Main area of concern is the rise in the sea level. Moreover, the emission levels are expected to grow in the future.

In view of the above The National Academies of Sciences, Engineering and Medicine (2019) has recommended use of Negative Emissions Technologies (NET) to improve the climate situation without comprising on economic targets.

The Royal Society acknowledges the fact that human emission of greenhouse gases is the main cause for climate change (Royal Academy of Engineering, 2018). In this regard it is imperative to carry out diversified

efforts from planting trees to introducing green technologies involving natural as well as social scientists to join hands to cope with this situation.

Pakistan has faced a number of natural calamities including floods, droughts and cyclones in the recent years which indicates vulnerability of the country due to climate change. In future the climate change is predicted to reduce agricultural productivity, pose water shortage issues, increase soil erosion in coastal areas and seawater incursion, and there is a strong possibility of extreme climatic events in Pakistan (Asian Development Bank, 2017).

In view of above, the Government of Pakistan has introduced Clean Green Index (CGI) and Clean Green Champion Program – CGCP (Ministry of Climate Change, 2019). The purpose is to rank Pakistani cities in terms of greenery and cleanliness. This would enable the country to maintain a check on the deteriorating climatic situation. In this regard involvement of different stakeholders and communities would be ensured to bring synergies.

In Pakistan, climate change has resulted in a paradigm shift in the seasons. Summers are observed for stretched and long months as compared to winters. Heavy rainfalls and melting of glaciers cause floods which devastatingly damage the crops as well as livelihood of the people of many areas. Since the temperature has risen by 1.5°C, the production and harvesting of crops like wheat, rice and other food items have been impacted to a magnitude that high quality crops are now only exported and hardly distributed indigenously to the people of Pakistan.

Water scarcity is another problem arising in Pakistan. Due to the droughts in the southern region in the country, most of the agricultural crops and vegetation are destroyed. The government needs to take significant measures to control the rise in the temperature. Climate change is not just about melting glaciers, but also about fluctuating snowmelt and precipitation patterns.

This study has been conducted to report the climate change patterns in Pakistan and to highlight the policy interventions so far made and future initiatives envisaged to cope with the adverse effects of changing climatic conditions. Moreover, future strategies advocated by the climate experts are highlighted.

In order to conduct this study, literature review has been performed using top to bottom approach whereby global changes in climate regimes are discussed with sector experts in view of past trends depicted in different studies. In order to highlight the policy interventions made by different stakeholders to counter the adverse effects of climate change, online panel discussions were conducted with climate experts while ensuring valid analysis of key issues highlighted and careful examination of the countermeasures identified in this regard for policy interventions.

## 2. LITERATURE REVIEW

The changing climatic patterns all over the world, as a result of increasing population and industrialization, are of great concern for global and national stakeholders. Carbon emissions have increased phenomenally and are seen as a major cause of deteriorating climatic conditions. The carbon emissions cause greenhouse gas emission and use of land for domestic and commercial purposes are the main causes of deforestation. The combined effect of all these factors is depletion of ozone layer which has resulted in rise in climate change and temperature (Schandl et al. 2016).

Increasing carbon emission has resulted in continuous atmospheric pollution. It has been observed that due to depleting ozone layer there has been sudden rise in temperature in some areas of the world and sudden floods have been caused due to melting glaciers (Schandl., et al. 2016).

Historical data shows that by in large the temperature is rising which has resulted in overall global warming (Owusu, & Asumadu-Sarkodie, 2016). As a consequence, the agricultural sector is hit by global warming which in turn has caused ripples in the global value chains.

World over there has been an increase in temperature over water as well as land (Rogelj., et al. 2016). Changes in rainfall seasons have also been noticed due to climate change. So far due to the global climate change, extreme drought situations have emerged and also there has been increased frequency of floods. High sea-levels are expected in coastal lines and occurrence of weather alerts has increased in recent times as an emergency response measure (Gulagi, Bogdanov, & Breyer, 2017).

There has been a significant shift towards use of renewable energies in the developed countries because of the effect of use of fossil fuel on world weather. This is being mitigated through active policy interventions on the

basis of climate profiling particularly by the G20 countries (Bunge et al., 2021; Kardooni, Yusoff, & Kari, 2016).

According to many studies, the changing climatic conditions will negatively impact global economies, in view of which appropriate strategies have been formed to achieve the goals set in the Paris Agreement (de Jong, et al. 2017). There has been an active drive for adaptation of renewable sources to meet the energy needs in many countries.

It has been debated that in the developing countries, transformation efforts for conversion to renewable energy from fossil fuel has so far been pretty challenging due to lack of experience and required resources (Bhan, et al. 2017). In order to counter this, there has been renewed interest in enabling policy makers to devise mechanisms and plan the transformation from conventional sources of generating energy to renewables. The climate change has made both developed and developing countries strive to adopt technologies to curtail carbon emissions particularly in industrial sectors as well as for domestic needs.

The main focus has been to introduce technologies used in the industrial settings which minimize carbon emissions (Khan, Liang, Mia, Gupta, Wei, Jamil, & Ning, 2021; Nowotny., et al. 2018). On the other side, there has been a significant emphasis in both developed and developing countries to control deforestation and introduce climate friendly agricultural practices.

There has been a renewed interest in ensuring food security by supporting rural development and improving agricultural practices advocating the need for using green technology (Singh, Sharma, Bhardwaj, Arya, Bhardwaj, & Khatri, 2021). It has been realized world over that reduction in carbon emission levels is imperative for sustainable living. In this regard it is essential to pool collective efforts for controlling population and use of green technology to bring the extent of carbon emission to a satisfactory level.

Several studies have been conducted in Pakistan that have paved the way for greater concern and mobilization of stakeholders that has culminated over a decade in formation of key strategies and policies to counter climatic threats in the country (Ahmed, Malik, Ramay, Munawwar, & Pervaiz, 2011; Khan et al., 2011; Malik, Awan & Khan, 2010; Mir, Purohit, & Mehmood, 2017).

### 3. METHODOLOGY

There are different methods for conducting survey research. Interview serves as an instrument for data collection and particularly carrying out exploratory studies. Interview is generally defined as transfer of information through interactive participation between a researcher and the participants (Cresswell, 2012).

Since this study is of exploratory nature hence interviews have been carried out with environmental experts to collect relevant information to pinpoint the center of gravity and patterns of causes and effects. In this regard qualitative data is collected through open-ended questions in online interactive sessions conducted through ZOOM video communication software which is in vogue in the world and known for its worldwide application.

As suggested by Creswell (2012), transcription of video clips were carried out to collate the information for analysis. Interviews are extremely useful to uncover the learnings and experience of experts on a particular topic and it enables to follow-up on the items which need further clarification (McNamara, 1999).

Qualitative research enable researchers shed light on factors which are apparently hidden pertaining to a specific topic and with the help of feedback from suitable participants new insights are revealed. Hence it is important to have a meaningful interaction followed by carefully examination of the meanings and valuable points highlighted in online session by the participants. It is also vital to make valid interpretations and form valid insights from these discussions (McNamara, 2009).

The main objective for asking open-ended questions is mostly to gather candid and spontaneous feedback from the participants, while closed-ended questions may tilt the participants respond in a particular manner (Creswell, 2012; McNamara, 1999). An open-ended question provides more room to the participant to respond freely whereas in the case of a closed-ended question the participant is forced to make a choice from available options (Creswell, 2012).

After conducting the panel interviews online the contents were transcribed and careful analysis of the dialogue was carried out to highlight and identify key risks and respective counter mitigation strategies.

### 4. GLOBAL PERSPECTIVE

The foremost cause of climate change is the rise in the temperature. Nowadays, the global rise in the temperature is 1.5°C and it has already affected the agricultural and fertile lands. If the temperature rose to 2.0°C, there would be drastic runaway climate change, resulting in a catastrophe. The climate change is majorly due to the massive emissions of carbons, burning of oil, coal, gas, deforestation, cement production and so on and so forth. Climate change has the following effects globally:

### ***Intense and more frequent storms***

As we can see, nowadays, we observe storms in the West majorly, which are disastrous to the extent that whole cities are wiped-out. This is because there is a lot of developmental work going on in the West which has resulted in deforestation.

### ***Cycles of flooding and droughts***

Another effect of climate change is that either there would be continuous floods because of the melting of the glaciers or there would be complete droughts in the areas having scarce water supply.

### ***Melting of polar caps and glaciers***

The rise in temperature causes melting of the glaciers which in turn converts into gushing waters, destroying everything while going down the hill.

### ***Inundation of low-lying coastal areas from sea level rise***

Coastal areas are also adversely hit by changing climatic patterns as due to constant rains in the coastal cities, the level of seawater rises to an extent that floods could be expected. The fact of the matter is that forests of around five million hectares are being cleared every year, yet no corporate transparency is in place to address the issue. This risks the entire world because the effect of deforestation and emissions of carbon is bringing in drastic climate change.

***Climate change has major impact and consequences. As a result of climate change, storms are becoming more intense and frequent, cycles of flooding and drought are taking place more often, polar caps and glaciers are melting and coastal areas are being swallowed by the seas due to an increase in the water level. As a result, agricultural output is declining and water scarcity has emerged as a major global problem and the humans are prone to more health risks.***

The ultimate results of climate change are as follows:

### ***Reduced agricultural output***

Certainly, when the temperature of the land rises, the required temperature and environment for the agricultural land cannot be provided, resulting in the destruction of crops and vegetables. In case of droughts, agricultural impact is of more extreme nature.

### ***Extinction of many species***

When the land becomes warmer, species of that area start to become extinct. We are currently observing the significant reduction in Snow Leopards in the northern areas of Pakistan. This implies that climate change can massively affect the natural habitat of the living beings.

### ***Increased water scarcity***

In the areas where water is already scarce, climate change can completely dry-out the land. Since climate change brings rise in the temperature, the water starts evaporating, resulting in the dryness of the land.

### ***Increased health risks***

Climate change can have serious consequences on public health. Numerous diseases have originated from this deadly development. According to the Intergovernmental Panel on Climate Change, the human-induced global warming is at the rate of 0.2°C per decade — an alarming rate to say the least. We have a great impact on our surroundings and environment, due to the recent climate changes because of global warming, factory waste materials,

scarcity of clean water, increasing urbanization, collectively resulting into natural disasters, floods, droughts and extreme weather conditions.

There is no doubt that climate change is affecting us even the environmental researchers seem to have accepted the fact that the earth is now 1.0°C warmer than it was in the pre-industrial times. Global organizations, such as the UN, are working to hold the temperature increase at 2°C in the near future, while simultaneously trying to halt the overall warming by 1.5 °C by the year 2100.

Climate change is one of the crucial and critical global challenges of our time. It has effects on all forms of living in the entire ecosystem including people, animals and plants. Every species is suffering from the changes in weather patterns around on a massive scale. These changes are disrupting agricultural supply chains, further endangering food security, a rise in sea levels and the accelerated erosion of coastal zones. These are increasing the intensity of natural disasters, species extinction, and spread of vector borne diseases.

The indiscriminate use of chlorofluorocarbons, deforestation, and green house affect are adding to the catastrophe. Climate change is perhaps the greatest challenge humanity has ever faced. It affects every corner of our planet from the poles to the tropics, and from the mountains to the oceans. People and nature worldwide are already feeling the effects as water supplies dwindle, as extreme weather events are increasing in frequency and intensity, forests burning, and coral reefs dying. Since the industrial revolution, it has been estimated that the human actions have caused average global temperatures to rise by almost 1.0°C.

The highest temperature which is sustainable for humanity is 2.0oC and now a day it is already up to 1.1oC degree which is an alarming situation. This ultimately causes storms, floods, drought, melting of glaciers, reduced agriculture land, and is also endangering animal species. Furthermore, locusts' attacks now a day are also an after effect of climate change due to rainfall and cyclones in Arabian Sea.

### 5. EFFECTS OF CLIMATE CHANGE IN PAKISTAN

The Inter-Governmental Program on Climate Change (IPCC) advocates reduction in emissions of up to 1.5%. This requires formulation of effective policies and their swift implementation in an integrated manner. The world has to minimize, to the extent possible, the use of fossil fuels in order to ensure healthy environment.

Pakistan was represented by a delegate during the Paris Agreement held in 2015. Pakistan also sends its representatives regularly to attend COPE meetings, which takes place every December for the last 30 years under the auspices of which all countries have agreed to limit their emissions to 60% - 80% and pledged to ensure sustainable environment.

Pakistan emits only 1% because it is mostly an agrarian economy but high in suffering, because its coastal belt and mountains are widely hit by volatile climatic conditions mostly due to floods like the one in Chitral in 2019. The impact of this climate change is mostly on the crops which are destroyed; too much rainfall causes floods and also creates food security issues. For instance the recent locusts attack in Sindh province has ricocheted from Saudi Arab, India, and Iran.

Pakistan in 2010 was most affected by global warming and was in 5<sup>th</sup> ranking from the last previous two decades. In December this list is updated and unfortunately there is only 2% to 3% forest cover left in Pakistan. Green economy is not related to capitalist growth but focuses on sustainable growth and by that one of the sector experts gave example of China that it invests the most in the world in renewable energy and Pakistan should emulate this example.

Mitigation measures include use of renewable energy, protection and expansion of forests, more efficient and productive use of fossil fuels. Adaptive technique that can be deployed are rainwater harvesting, planting trees, better agriculture practices, by creating awareness and improving and enhancing mechanisms for protection of environment.

In an interview with the Minister of Climate Change, it has been revealed that the Government is mulling over the option of giving incentives for import of electric vehicles and is thinking of introducing Bus Rapid Transit (BRT) in metropolitan cities as new long-term socio-economic sustainability factors.

Green Stimulus Package has been introduced during outbreak of COVID-19 pandemic which involves plantation of 10 billion trees under the auspices of Tsunami Tree Plantation Project that is also anticipated to provide employment to 65,000 people and a Clean Green Initiative Project which focuses to recycle waste material and improve the environment.

This means that people will be urged to reduce emissions - no house, no machine, no business, no industry and even no factory will be allowed to use fossil fuel for energy purpose above the stipulated quota. Use of diesel and gasoline in the vehicles will be curtailed and reliance on renewable energy for electricity generation instead of diesel, furnace oil and gas. The government delays the action of prevention because the government is elected for at least five years.

Under the Paris Agreement 2015, Pakistan has agreed to participate with other countries in the drive to limit the global average of temperature increase to below 2 degrees with the aim of reaching to 1.5 degrees. In the real emission reduction that would mean 60% to 80% cut by countries in the second half of the century.

Nationally Determined Contribution (NDC) is playing a vital role to meet the desired targets. It is aligned with the respective policies, plans and sectoral growth targets set by various ministries and other government entities. Under United Nations Framework Convention on Climate Change (UNFCCC), the Parties to the Convention are required to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

The transition to a Green Economy has a long way to go, but several countries are demonstrating leadership by adopting national “green growth” or “low carbon” economic strategies. In Pakistan, there has been a paradigm shift in the seasons due to climate change. As compared to winters, summers are observed for extended and long months. Heavy rainfall, flooding, glacier melting has dramatically damaged the crops as well as the livelihoods of the people in the region. The planet needs to adjust to climate change, so there needs to be full swing preparedness. The temperature increase is constant, and mitigation steps should be taken on war footing. Rain harvesting is a process in which rainwater is conserved to be used for various purposes later. Better farming practices to safeguard our crops and agricultural fields are required.

Maximum awareness must be spread among the public and importance of healthy environment shall be emphasized. Pakistan's government has constructed solar park Quaid-e-Azam in Bahawalpur. This is a 500-acre solar powered plant with a capacity of 100 MW and holding 392,158 solar panels. The promotion of renewable energies needs promoting roof-top solar systems.

Wind energy investment is on the rise in Sindh wind corridor, projects such as Jhimpir Wind Power Plant, Wind Energy I & II Foundation, Artistic Energy (Pvt) Ltd, Three Gorges First Wind Farm, Sapphire Wind Power Plant, Tricon Boston Consulting Corporation, Wind Power Plant, ACT Wind Farm, Metro Power Company Limited.

While the ongoing COVID-19 crisis has hit an unprepared world and forced it to take reflect back. A silver lining has also emerged around this black cloud. As humans retreat under forced lockdowns, nature has made an eager and speedy comeback in the form of rehabilitation, reenergizing and reclaiming lost space, while forcing humanity to recognize their extreme vulnerability to the destruction of the ecosystem they live in.

Prime Minister of Pakistan has approved a “Green Stimulus” focused on two objectives - job creation and restoration of our natural ecosystems. The focal areas are planting trees, reviving our protected areas and sanitation improvement while the targeted beneficiaries are the unemployed youth and women and daily wagers currently out of jobs and migrating to rural areas. All can be easily made COVID-19 safe, can deliver climate compatible development and provide avenues for jobs as custodians of the environment.

The Green Stimulus package is a part of 10 Billion Tree Tsunami project that aims to promote plantation, setting up nurseries, natural forests and promotion of honey, fruit and olive plantation in the country. Buried under layers of soil and rock, decomposing plants and other species took a very long time to become the carbon-rich deposits that we now know as fossil fuels. Such non-renewable fuels include coal, oil, and natural gas which accounts for 80% of world energy supply. Such combustibles include electricity, heat and transport, although also promoting the production processes for a variety of products from steel to plastics.

Scarcity of water is a major issue in Pakistan that the people are facing. Water is the most important among all substances on earth. All plants and animals must have water to survive. If there was no water there would be no life on earth. Apart from drinking it to survive, people have many other uses for water. Pakistan is an arid country and Pakistan's largest city, Karachi, which is also the country's industrial center, is more humid than Islamabad but gets less rain.

The climate is generally arid, characterized by hot summers and cool or cold winters, and wide variations between extremes of temperature at given locations. There is little rainfall. Pakistan's climate change concerns include increased variability of monsoons, the likely impact of receding Himalayan glaciers on the Indus River system, decreased capacity of water reservoirs, reduced hydropower during drought years, and extreme events including floods and droughts.

Pakistan's ambitious Electric Vehicle (EV) policy has been approved for implementation recently, but leaves cars out of its first phase. Covering buses and trucks, as well as two and three wheel vehicles, including rickshaws and motorcycles, the new policy encourages manufacturers to start producing electric vehicles and customers to buy them.

Pakistan conceivably faces the challenge of significant environmental change ahead. A coordinated exertion by the legislature and common society at all levels is required to relieve this danger. The yearly average temperature in Pakistan is relied upon to ascend by 3°C to 5°C for a focal worldwide discharges situation, while higher worldwide emanations may yield an ascent of 4°C to 6°C.

Under emergent ecological change, Pakistan is required to experience extended vacillation of streams on account of extended changeability of precipitation and the melting of ice sheets. Enthusiasm for developing a water framework may be in offing in the light of higher dissemination rates.

Hotter air and water temperatures may diminish the effectiveness of atomic and warm force plant age. Mortality because of extraordinary warm waves may increment. Urban seepage frameworks must cover the risks of high precipitation and blaze floods. Ocean level ascent and tempest floods may antagonistically influence beach front foundation and vocations.

Pakistan's broad bone-dry and semi-dry territories, are prone to regular risks, and noteworthy reliance on rainstorm precipitation and the icy mass took care of Indus Bowl make it defenseless against environmental change.

### ***Future Direction - Pakistan***

There are potentially two methodologies for mitigating the dangers of climatic change in Pakistan i.e., adaption and moderation. Adaption is the system for limiting the impacts of anticipated changes in the atmosphere. Considering Pakistan's lack of protection factors and the threats it is exposed to. The participants of the online session felt that adaptable measures are most basically required to ensure countermeasures against harmful climatic change particularly in terms of conservation of water resources, productive crop cultivation and food security, in promising zones and organic systems.

According to the experts, the following recommendations could help for adaption approach:

1. Introduce water harvesting including waste recycling systems.
2. Improve irrigation technology and promote organic fertilizers, ensure water availability in agricultural areas.
3. Promote forestation and discourage deforestation.
4. Build surface and ground water resources.

Pakistan obviously needs to connect with the global drive as a result of climatic concerns. It is essential for Pakistan to address these issues at all levels so as to ensure successful security regimes in the face of anticipated environmental catastrophes in the future.

Pakistan needs to do more, and faster. Most importantly, the country needs to step up the efforts to switch from using fossil fuels – the biggest cause of climate change – to clean, renewable energy and enable people and nature adapt to the inevitable changes ahead. Protecting and restoring forests and producing and consuming food more sustainably, will also make a major contribution – while helping reverse the loss of nature at the same time.

Most importantly, environment and climate change are inextricably linked to sustainable development. Pakistan requires greater progress in environmental protection. Water scarcity is increasing, land productivity is decreasing, and climate change is worsening these threats. The risk of natural disasters, also exacerbated by climate change as well as economic shocks, adds to existing vulnerabilities.

Pakistani policy makers are promoting the integration of climate-resilient and environmentally sustainable policies into development plans and implementation schemes in Pakistan. UNDP is supporting projects across Pakistan to respond to the growing threat of climate change linking mainstream environmental concerns into national development planning processes; and to expand access to environmental and energy services for the poor. In particular, UNDP has sought to ensure that the poor have stronger capacities to manage, adapt to and monitor climate change.

According to a climate expert, the world has the technology to provide everyone on Earth with clean and renewable energy. And together, we can create a fossil-free future – and give ourselves the best chance of averting climate catastrophe. We will enjoy cleaner air, and protect the vital habitats of plants and animals currently threatened by oil and gas developments. And we will together help steer our cities towards low-carbon development.

Pakistan can also prepare for the impacts that will result from climate change – and help people and nature adapt to a warming world. Youth should be given a chance to take an active part in decision-making at local, national and global level. They can actively support initiatives that will lead to the passage of far-reaching legislation. Therefore, a more defined role should be given to the youth to tackle climate change.

The Pakistan Environment and Climate Change Outlook (ECCO) 2013 is one of the outcomes of this mandate. It uses an integrated environmental assessment methodology developed as part of UNEP's Global Environment Outlook assessment process, to present and analyze data and collate critical information on the state, trends and outlook of the environment.

The Pakistan ECCO report has a particular focus on climate change, and is expected to guide environmental policy, strategy development and planning in the years to come. The report presents concrete evidence that food, freshwater and the livelihoods of the Pakistani people are under threat due to climate change and environmental degradation. It reveals that inadequate capacity, unsustainable consumption and production, poverty and inequity are primary factors that undermine progress towards environmental sustainability in Pakistan.

Recently, electric vehicle policy has been announced by Prime Minister of Pakistan to cater carbon dioxide emission problem and he also took initiative of planting trees and policy making for the protection of natural areas and for promoting green economy. He is expected to launch such projects which will cater for the employment of people as well. There are many run-of-the-rive hydel power projects in the pipeline as well.

## 6. CONCLUSION & RECOMMENDATIONS

Climate change can be mitigated by decreasing the use of fossil fuels more efficiently in industrial sector. Switching to renewable energy like solar and wind is the main way forward in addition to protecting and expanding forests as they act as carbon absorbing sinks.

In this regard two-pronged approach is recommended by climate experts i.e., adaptation and mitigation. Adaptive technique that can be deployed are rainwater harvesting, planting trees, better agriculture practices, by creating awareness and improving and enhancing mechanisms for protection of environment. Mitigation measures include use of renewable energy, protection and expansion of forests, more efficient and productive use of fossil fuels.

If the pattern of the rain and monsoon season is changing then the farmers should be ready to cultivate the fields and harvest the crop fields early. They should be educated and aware by the climate changes beforehand to avoid any upcoming disasters.

On the other hand, mitigation refers to preventing the rise of temperature on a global level when it comes to climate changes. There is a general consensus that the usage of fossil fuel should be minimized and renewable energy and solar energy should be adapted in our daily lifestyles. The climate changes have an effect on two of the most important cycles on which the mankind and human existence depends on i.e. water cycle and energy cycle. The rising temperature of the earth affects both of these.

Energy use including fossil fuel, coal, oil and gas needs to be restricted more likely coal power plants should be prevented in order to stop global warming. Climate Change is a huge development as well as a huge environmental challenge. Apart from the global impact, it is hitting the poorest and the most vulnerable first and hardest.

The effects of climate change also weigh disproportionately on the poorest, and on women and children. Successful climate change adaptation, coupled with effective mitigation, holds the key to human development prospects.

The Environment and Climate Change Outlook of Pakistan is a review of the environmental conditions, the impacts of climate change and the status of national response to the changing situation in the country. Its objective is to provide a general evaluation of the quality of environment and emerging sustainable development trends in the country. While providing data and information on environmental conditions and trends and emerging problems, particularly climate change, the report also critically analyses the policy response to these issues in the country. It also illustrates successful initiatives and best practices, some of which may be replicated.

Finally, the report identifies key challenges and areas in which urgent action is needed. The global consensus on the need for climate action is strong and continues to grow. The shift away from fossil fuels has already begun. Governments and communities are coming together to act – and we can still escape the worst impacts of climate change, and build a safer future for all. Youth should be given a chance to take an active part in decision-making at local, national and global levels. They can actively support initiatives that shall lead to the passage of far-reaching legislation. Therefore, a more defined role should be given to the youth to tackle climate change.

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