Paradigm Shift

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Foreword

Welcome to the first edition of the Paradigm Shift e-magazine. Since starting Paradigm Shift (www.ParadigmShift.com.pk) on August 14th, 2020, we have come a long way.

With over 80k-100k monthly visitors, and over 40,000 followers on social media, we are now able to serve a wider percentage of the Pakistani youth. All our pieces are sent in by brilliant writers and researchers, and our gifted editors constantly ensure the quality of our content.

We aim for, and work towards three major goals:

1. To become a comprehensive library with high-quality content on international relations, current affairs, global politics, and Pakistan.
2. To provide a free medium where individuals can access research from across the globe, and can send in their own work to share their voice with the world.
3. To showcase Pakistan in a positive and factual manner through our 'Pakistan Unveiled' section.

We have handpicked 5 special pieces from our website for this first edition, and we hope that you gain some insights from them. For more content on a variety of topics from across the world, please visit www.ParadigmShift.com.pk.

We hope that you consider sharing our website and social media with your friends and family so that we can effectively increase our reach. Thank you again for all your support through the years.

Pakistan's Energy Crisis & Its Solution

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Energy Security

The life and processes that take place across the whole world depend on energy. It's similar to how the Earth may be powered. Since many production and consumption activities need energy as their primary input, it is highly important for the growth and economic development of a country in its growing stage. According to authors like Barney and Franzi, energy accounts for less than one-tenth of production costs while driving nearly half of industrial development in the modern economy. However, where there is energy, there is also a crisis.

What is it that affects everybody's life yet cannot be touched directly? It's natural gas. It heats our homes and drives our economy. And when there is a depletion, it kind of has a worldwide butterfly effect. The energy crisis is the shortfall or the interruption to the provision of energy supplies. It can be surprising to find out that developed countries like China and Japan are also energy insecure. Yes, the 2nd largest and the 3rd largest economies of the world, respectively, are not secure as far as their energy needs and production are concerned.

This is because energy insecurity is defined based on whether a country is self-producing the energy for its requirements, whether it imports the energy to meet its requirements, or whether it is an exporter of the energy to other countries. Along these lines, energy security for a self-producing country can be defined as having available, accessible, and affordable energy at all times.

Similarly, if it is an exporter, then the country's energy security depends on its ability to keep the supply-demand high and global energy resources under its control. And if it is an importer, then it must keep the energy prices and global energy markets under its influence, as well as strive to keep its balance of payments positive.

Pakistan's Energy Crisis

As of right now, the world is facing a shortage of energy and it has sent shock waves from Europe to Asia. Pakistan is no exception. The energy industry in Pakistan is in crisis, due to a lack of energy output to keep up with the country's rising demand during the past few decades. Pakistan is now reliant on imported energy resources like gas and oil.

The Asian Development Bank published a white paper in 2019 claiming that Pakistan is an energy insecure country. Besides Pakistan, there are numerous countries worldwide including the developed ones that are also energy insecure.

There are several examples of market growth followed by a downturn and severe contraction since the energy industry is, by nature, in a loop. But the current crises are different in several aspects. The recent increase in energy costs has given us a glimpse into the future, where market disruptions might result if the transition to low-carbon energy sources is not adequately managed or stressed. According to Shazia Anwar Cheema, Pakistan might face an extremely challenging and disastrous winter as a result of the lack of long-term energy management strategies by policymakers.

The crisis is likely to worsen due to the Middle Eastern countries, which serve as the major source of imports, being severely impacted by the strain that Europe is experiencing as a result of the fuel and gas shortfall. The current bleak situation shows that the power shortfall at the moment is about 7,500 megawatts which subsequently results in 10-18 hours of load-shedding. This means the current supply is about 1,800 megawatts and the required supply is 25,000-25,500MW. Furthermore, Pakistan's energy cost doubled in the last 9 months; it now stands at 15 billion USD.

Energy Profile of Pakistan

The GOP, a.k.a. the Government of Pakistan, has unveiled a number of initiatives to facilitate the public's access to energy, spur economic expansion, and find a solution to the energy issue.
The initiatives include:

The National Power Policy 2013

The policy aimed to develop a power production, transmission, and distribution system that was effective and could fulfill the requirements of the populace while boosting the economy of the nation in a cost-effective and sustainable way.

Power Generation Policy 2015

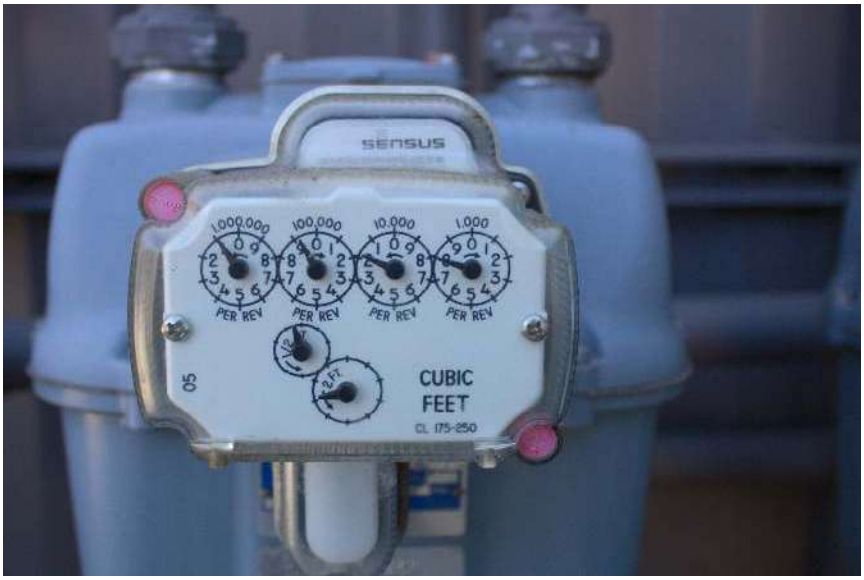
The fundamental goal of the policy was to have enough (cheap) available power production capacity while emphasizing the use of domestic resources, enabling all parties engaged in the trade, and protecting the environment.

Alternative and Renewable Energy Policy 2019

The major objective of the 2019 policy was to encourage and support the nation's development of renewable resources.

To satisfy the nation's needs, Pakistan produces a very small fraction of its total oil output. The production of domestic oil is restricted by technical, budgetary, and technological limitations. According to the most recent figures, the cost of oil imports surged from July through April of FY2022 from US$8.69 billion to US$17.03 billion, a 95.9% rise.

Oil is becoming more costly due to rising global oil prices and the severe devaluation of the Pakistani rupee, which is putting pressure on the country's external sector and worsening its trade imbalance. Similarly, between July and April of FY2022, imports of LNG (liquefied natural gas) increased by 82.90% in value, while imports of liquefied petroleum gas (LPG) increased by 39.86%.



Pakistan is also using nuclear technology to produce electricity, and its share is rapidly growing. During the period of July–March FY2022, the gross capacity of nuclear power plants rose by 39% to 3,530 MW, delivering 12,885 million units of energy to the national grid.

If we see the consumption of electricity by different sectors throughout Pakistan, it is divided into various areas like domestic, commercial, industry, etc.:

Units Sold (GWh)	Household	Commercial	Industry	Agriculture	Others	Total
FY2020-21 (July-March)	41,508	6,246	22,280	7,558	7,008	84,600
FY2021-22 (July-March)	42,055	6,648	25,160	8,151	7,347	89,361

Electricity consumption per sector

Reasons for the Looming Energy Crisis in Pakistan

The conflict between Ukraine and Russia has caused fuel prices to soar, endangering the supply chain and making it challenging for Pakistan to support the effective operation of its power plant. In order to take advantage of the profitable European markets, LNG companies have broken their agreements with Pakistan. Long-term LNG suppliers canceled several shipments scheduled for delivery over the last few months, further tightening supplies, which has directly resulted in complications for Pakistan. Pakistan is currently being forced to buy pricier LNG.

The ever-changing leadership and political turmoil, and their unwillingness to address the situation and create a solution further aggravated the situation. Governments, political parties, and other interest groups continue to interfere with business decisions like employing and disconnecting default customers. In the meantime, the utility firms disavow all liability and accuse the management authorities of wrongdoing.

There is an absence of coordination that prevents the implementation of any kind of comprehensive or integrated energy policy that may support Pakistan's struggling economy and energy industry. Moreover, at a staggering 2.5 trillion Pakistani rupees, the circular debt is 10% more than it was in the previous fiscal year. By 2025, it is anticipated to reach 4 trillion Pakistani rupees, according to studies.

Reportedly, Rs. 1.5 trillion is owed by Sui Southern Gas Company Ltd (SSGCL) and Sui Northern Gas Pipelines Ltd. (SNGPL) to the Oil & Gas Development Company Ltd. (OGDCL) and Pakistan Petroleum Ltd. (PPL)—the mainstay of oil and gas exploration and production in Pakistan. This low-cost domestic energy source costs less than half as much as imported LNG, which Pakistan is using more of.

Due to the severe financial load this is putting on our meager foreign exchange reserves, OGDCL, and PPL are unable to expand into new markets since their revenue is caught in a vicious circle of debt. The lack of new investment in exploratory initiatives in the aftermath of declining oil and gas reserves is concerning and does not bode well for the nation.

Apart from the aforementioned reasons, other contributing factors include:

- Decreasing gas supply and dependence on oil
- Unrealistic power tariffs (low investments)
- Low payment recovery
- Inefficient revenue collection
- Overpopulation, over usage

Impact of Energy Crisis on Pakistan

The industrial sector has also been severely damaged by the energy crisis. The manufacturing processes of several major and small-scale industries have been stifled by it. Due to the continuous energy constraint, the supply of gas and electricity to the industry was shut off. The South Asian country is experiencing a severe economic crisis, with energy imports being hampered by rampant inflation, a depreciating rupee, and shrinking foreign exchange reserves.

The textile industry is the industry most impacted. According to government statistics, the home sector's demand for energy has increased in the summer season as a result of the heatwave, resulting in a shortage of almost 7,000 megawatts—or one-fifth of Pakistan's generation capacity—on several days in the summer.

Pakistan's important textile sector, which sells everything from denim to bed linen to markets in the US and Europe and makes up 60% of the nation's exports, has been negatively impacted by the electricity deficit. According to Qasim Malik, vice president of the Chamber of Commerce in Sialkot, "the textile sector is in a situation of emergency".

What's the Way Forward?

Pakistan, like China and Japan, also generates its power from imported fossil fuels out of which 48% is natural gas and 33% is oil. Now the question is, what is the solution to the energy crisis in Pakistan? What measures shall Pakistan take as a result of which it could become an energy-secure country? All over the world, especially in Europe, there is a clean energy revolution in full swing.

A massive wave of transformation into alternative and renewable energy from conventional energy production methods by the year 2030 is underway. The national policies have been approved and now implementation has started. Denmark is one of the unique countries that have taken itself to a highly ambitious target of shifting to 100% renewable energy resources by the year 2050.

So, in these fast-changing global energy trends, there are numerous opportunities for Pakistan to find a solution to its energy crisis. Following are the recommendations for adopting practical ways toward renewable energy in Pakistan.

Research and Development

First of all, like other states, Pakistan needs to impose proper rules and regulations regarding the operating hours of industries. Our think tanks and research centers should publish research articles and policy papers that are Pakistan-centric, containing "robust implementation mechanisms" considering the local challenges. Pakistan needs to combine all the energy-related institutions' under a single ministry, which will create efficiency in the currently dysfunctional energy sector and the whole sector will be streamlined.

Entrepreneurial Solutions

For Pakistan's energy sector to be supported, it requires reliable funding and tax reforms. Then Pakistani entrepreneurs have a golden chance to come up with clever ideas to tackle the energy insecurity problem of Pakistan.

They should mobilize land, labor, and capital based on the research by policy experts to invest in the manufacturing of green technologies that can be used locally as well as internationally. The government of Pakistan is soon coming up with a National Innovation Fund of Rs. 100 Billion according to unofficial sources of the Planning Commission of Pakistan. The Innovation Fund will aim to provide financial subsistence to innovative entrepreneurial ideas that can contribute to the economic improvement of Pakistan. Thus, young graduates and businesses may soon have a great opportunity to create and pitch solutions for green technology.

Investing in Renewable Energy Industry

Similarly, it is a golden chance for local and overseas investors as well to invest in Pakistan's Renewable Energy Program for which the government of Pakistan has given an Alternative and Renewable Energy Policy in 2019. The document is the updated version of the RE Policy for Development of Power Generation 2006.

Moreover, importing clean coal, which is frequently less expensive than imported oil and gas, will allow Pakistan to first diversify its energy mix.

To reduce its dependency on conventional energy sources, Pakistan needs to decrease the demand for the grid station. It can do so by converting small-scale companies to solar energy and making them self-sufficient. Cattle farming needs to be locomoted across the country. In order to reduce their reliance on the national grid, other sources like the use of windmills have to be taken into consideration.

Public-Private Partnership

The public sector of Pakistan must make renewable energy a priority. The GoP should collaborate with the countries like China that are technologically advanced, and use this as an opportunity to improve bilateral relationships with them. Along with this, the government must subsidize the renewable energy industry and promote public-private cooperation to bring Pakistan out of the energy crisis.

Conclusion

The world is changing rapidly. Every process is being automated to save time and simultaneously speed up production mechanisms. Without energy security, keeping up with the modern world will not be possible. If we strive to become competent and develop Pakistan as a modern country, we must quickly adopt renewable energy methods to supplement our energy needs.

Due to the dynamics of the global economy, it may seem that in the near future, Pakistan will not experience a drop in the energy issue. However, it is the responsibility of the political leaders and the stakeholders of Pakistan to minimize this energy crisis and find a solution to it. It's important to keep in mind that being optimistic will help manage any degree of crisis. Moreover, we should all do whatever we possibly can to strengthen our country on all fronts.

The views and opinions expressed in this article/paper are the author's own and do not necessarily reflect the editorial position of Paradigm Shift.

To learn more about the energy crisis & renewable energy in Pakistan, please read: "What Are The Challenges of Switching to Renewable Energy Sources?"

Weather Warfare: Weapons of the Future

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Introduction

Since conflict is impacted by geopolitics, social, technological, financial, environmental, and military advancements, its future cannot be predicted. When we consider warfare, we're often prepared for the most recent conflict, use archaic military metaphors, or focus on historically effective combat tactics that are now or soon will be obsolete. The picture of international security is fast changing (Dennis, 2008).

Modern weather manipulation (WM) was developed by Langmuir and Schaefer in 1948 (Schaefer, 1953) by utilising dry ice pellets to make holes in supercooled stratus via snow-out. This experiment provided compelling visual proof that seeding is beneficial, which encouraged more rain augmentation and hail avoidance initiatives all around the world.

In a 1961 address to the United Nations, President John F. Kennedy declared that he would be proposing additional joint efforts across all countries in weather prediction and ultimately weather management. This alone depicts the enthusiasm about humanity's infinite anticipation to modify the weather (List, 2004). He envisioned a day when it would be possible to manipulate the weather, such as by pressing a button at two in the morning to bring on rain at five in the evening. However, he did not specifically mention "weather manipulation," as is to be noted.

Concept of Weather Warfare

Weather warfare is a kind of modern conflict in which the opposing nation is conquered economically, tactfully, and covertly while suffering the maximum amount of pain possible via the use of deliberate weather manipulation and geoengineering techniques. In this instance, bad weather makes it impossible for the adversary to engage in combat.

The most common kind of weather warfare is cloud seeding which may be employed to increase snowfall or rain. Weather manipulation may be used in battle because it can be used as a tactical weapon, a strategic weapon, or a covert way to harm an enemy state's economy. In many ways, military weather modification technologies and weather control endeavours are similar.

The management of hurricanes and other severe storms, the elimination of warm and supercooled fog, the modification of cloud cover, the enhancement of precipitation (rain or snow), and the control of lightning have all been researched. The consequences of injecting pollutants into the atmosphere, coating ice with lampblack, releasing frozen carbon dioxide into the clouds to produce snowstorms, and ozone depletion have all been studied via experiments and computer models.

Experiments on Weather Modification

In an effort to alter the weather, Harvard University professor Emory Leon Chaffee fired charged sand from an aeroplane in 1924. In 1930, W. Veraart shot dry ice into the skies to change the weather. Only his book in the Dutch language contains the results of his investigation and the methodology he used. Henry G. Houghton, a professor at MIT, sprayed hygroscopic solutions into the fog in 1938 to clear it (Fleagle et al., 1974).

On November 13, 1946, a scientist named Dr. Vincent J. Schaefer and a pilot working for the General Electric Research Laboratory took off and flew 30 miles to the east of Schenectady, New York, at a height of 14,000 feet. The operation included pouring three pounds of dry ice (frozen carbon dioxide) into the clouds (Weiss, 1975a). When Dr. Schaefer looked back, he was overjoyed by the long snow streamers that were emerging from the foot of the cloud that they had just traversed. They had produced a fictitious snowstorm or blizzard.

After the General Electric Research Laboratory's tests, it seemed possible for people to finally be able to manipulate the weather for military objectives. As tensions between the US and the Soviet Union increased, a hypothetical weapon that could be even more destructive than nuclear weapons is weather control (Fleagle et al., 1974).

Weather Warfare in Historical Context

The US President's Advisory Committee on Weather Control was founded in August 1953. Its stated objective was to evaluate the level of government involvement and the effectiveness of weather-manipulation strategies. Colorful pigments are used to melt the polar ice caps, unleash catastrophic floods, and release enormous amounts of dust into the stratosphere to create precipitation as required. It makes reference to Operation Popeye, a plan to extend the monsoon season in Southeast Asia (Byers, 1974).

The Seward Peninsula in Alaska, United States, and the Chukchi Peninsula in the Russian Far East are divided by the Bering Channel. Arkady Borisovich Markin, a Russian engineer, also built a dam across the strait that was outfitted with several nuclear-powered pumps. The waters of the Pacific Ocean might theoretically diverge, causing big cities like New York and London to become hotter. Despite Markin's claim that his goal was to "relieve the brutal cold of the northern hemisphere," American experts were concerned that weather control may be used to trigger floods.

In the middle of the 1950s, the media featured public debates on every theory created by American and Soviet scientists (Weiss, 1975a). The US military carried out Program Popeye, a highly classified operation, from 1967 until 1972. The objective was to lengthen Southeast Asia's monsoon season. The Vietnamese army's tactical logistics were badly hampered by the torrential rain.

During Operation Popeye, weather modification technology was successfully used for the first time in a military situation. When it was discovered, the Environmental Manipulation Convention (ENMOD) forbade its use in battle. An overview of weather modification technologies is given by Air Force Major Barry B. Coble in hisMarch 1997 book "Benign Weather Modification." He describes the changes that have taken place, especially at the hands of the CIA's and Pentagon's fiercest ideological adversaries.

In 1948, the meteorological community recognised the first initiative that was scientifically supervised and regulated as weather modification (Fleagle et al.,1974). Dr. Irving Langmuir's early study on purposefully seeding clouds to generate rain yielded promising results that almost immediately sparked a lot of interest in the area.

A 1996 research paper conducted for the United States Air Force theorised the possible use of nanotechnology to create "artificial weather" clouds of minute computer particles interacting with one another to create an "intelligent fog." An Air Force officer cadet presents weather modification technology as a force multiplier with remarkable potential that may be deployed in a number of post-war conditions in an unclassified academic study produced by students (Rodger, 2004).

International Laws on Weather Modification

Attempts to alter the weather and reflect solar heat have received less attention than climate change, which has lately taken centre stage on the global agenda, despite their potential to worsen regional conflicts. In an attempt to influence weather to their advantage or mitigate global warming, an increasing number of governments are utilising technology to manipulate atmospheric, oceanic, and ice conditions.

What may be advantageous for one country may not be advantageous for its neighbours since the impacts of these initiatives may cross national lines (Weiss, 1975b). Iran has previously claimed that Israel is taking its water by using cloud-seeding to reduce rainfall over its area. China, which already manipulates the weather artificially over its main cities, intends to be able to do the same throughout half of its territory by 2025, frightening nearby countries like India.

Saudi Arabia and the United Arab Emirates, two hostile nations in the Middle East, are ratcheting up their rain-making efforts (Dennis, 2008). Despite his commitment to environmental change, President Richard Nixon did not prioritise weather manipulation as a foreign policy issue in the years prior to the adoption of the weather modification accord. This was a period of unprecedented global cooperation on weather, despite Nixon's apparent lack of interest in a global agreement to stop weather manipulation.

The World Weather Watch and the Global Atmospheric Research Program promoted collaboration in 135 nations by using new and improved technologies. These significant developments in the realm of weather would provide the groundwork for a conference on weather manipulation. The best weapon for enforcing such acts is a UN convention from the end of the Vietnam War. The ENMOD Convention became effective in 1978.

The Cold War superpowers hammered out the agreement after ethical concerns over Project Popeye, a covert cloud-seeding operation undertaken by the US Air Force from 1967 to 1972. It prolonged the monsoon season in Vietnam and Laos so that roadways would flood and obstruct Viet Cong combat operations. This indiscriminate technology may endanger or ruin civilian lives, local food production, and private property when used in combat (Byers, 1974).

A reassessment of ENMOD is essential considering how quickly the earth is warming. Signatories "shall not engage in military or any other hostile use of environmental modification technologies with wide, long-lasting or severe repercussions as the means of destruction, damage, or injury to any other State Party," according to Article I of the agreement. Many weather and climate-changing technologies, without necessarily being ubiquitous, long-lasting, or severe, fit at least one of the three criteria (Darack, 2019).

Article II of ENMOD again casts a wide net, defining which environmental modification methods are included in the agreement. This would include all currently in use weather and climate modification technologies. It includes "any method for altering the dynamics, composition, or structure of the planet, including its biota, lithosphere, hydrosphere, and atmosphere, or of outer space, by the purposeful manipulation of natural processes."

The component of the convention that needs updating and clarification is the purpose question. The use of this technology for military or hostile objectives is specifically prohibited, and violations may be reported to the UN Security Council, but "peaceful motives" are allowed (Juda, 1984).

Implications of Weather Modification Techniques

Injecting aerosols into the stratosphere to boost precipitation or snowfall or alter a storm is the method that is most often utilised. Other methods include fertilising the ocean to boost carbon absorption, brightening clouds or ice to reflect more sunlight back into space and therefore lessen local or global warming, etcetera (Stutzriem, 2021). Such initiatives are presently being carried out in more than 50 countries, according to the World Meteorological Organization.

The Arctic Ice Project, a non-profit organisation, intends to disperse microscopic glass beads packed with silicon dioxide over regions of Arctic sea ice and in the Arctic Ocean to increase reflectivity and slow down climate change. Australian universities are experimenting with a salt spray that is sprayed over the Great Barrier Reef to reflect more of the sun's heat in an attempt to preserve it.

However, it is challenging for scientists to understand both the immediate impacts of the technology and its reverberations. The potential detrimental effects of cloud brightening, a kind of solar radiation control, on ecological systems, agriculture, and global warming are unknown (Trausti, 2022). The Intergovernmental Panel on Climate Change (IPCC) claims that cloud brightening worsens regional weather patterns, endangers the ozone layer, and does nothing to slow down ocean acidification.

In order to considerably reduce global warming, cloud brightening would also need to endure wars, economic downturns, and technological glitches. Any protracted hiatus would hasten global warming (*Climate Change 2021: The Physical Science Basis*, 2021). There is ambiguity over the possible harmful impacts of cloud-seeding on neighbouring countries, some of whom are already struggling with problems with food or water security.

As the distribution, predictability, and amount of precipitation vary due to the changing climate, these problems will become more urgent for many people. The use of technology has three distinct security repercussions.

The first is the possibility that its usage in one place may have an effect there. Second, it could be difficult to distinguish significant consequences from minor ones in neighbouring countries. This leads us to our third point: the use of the technology may be rationalised as benign, while covertly being utilised to hurt an adversary (Smith, 2006). There are questions about whether international law is the best way to regulate this technology in the context of climate change and national security as it is used by countries. ENMOD is the remedy.

Other UN environmental and climatic treaties and forums, such as the UN Framework Convention on Climate Change, the UN Environment Assembly, the IPCC, and the UN Biodiversity Convention, are essential for addressing various aspects of climate change. UN bodies including the UN Security Council, the Rome Statute of the International Criminal Court, and the International Law Commission are also essential in addressing how security affects climate and vice versa (Darack, 2019).

To address the use of environmental technology as a weapon, none of these is essential. Only the ENMOD Convention has this power. The timing is also advantageous. According to ENMOD's Article VIII, the UN Secretary-General must confer with signatories about the need of revising the agreement every 10 years. After the 2002 and 2013 review failures, the UN Secretary-General is expected to re-consult with the parties by no later than 2023.

If at least ten parties respond positively, the Secretary-General shall convene a review conference (List, 2004). Secretary-General António Guterres should use his position's soft power to convince parties to support a complete reform of the treaty. He should encourage other countries to ratify the accord as more adopt technology that changes the environment. The treaty must also be updated to reflect a normal and contemporary understanding of "hostile" and "peaceful" purposes.

To tackle climate change, nations must reduce emissions and support climate adaptation. However, they must also consider how weather modification and geoengineering might impact security. Reactivating ENMOD should be done first (*Climate Change 2021: The Physical Science Basis*, 2021).

Weather Modification Technologies: A Contemporary Challenge

Many countries continue to perform many experiments and exercises to understand how to control the weather and use it in combat. As an example, the Russians have long used weather manipulation as a hail management strategy. China has also utilised cloud seeding to produce rain.

Conspiracy theorists assert that ideas like chemtrails, the High-frequency Active Auroral Research Program (HAARP), geoengineering, and weather modification are not scientific endeavours or research projects, but rather cutting-edge military tools that could be used in weather warfare to eliminate an adversary (*Weather Warfare: Weather Modification Technology in Warfare*, 2021).

Dr. Irving Langmuir, winner of the Nobel Prize in physics, and Dr. Vincent J. Schaefer worked together on those initial tests for the General Electric Research Laboratory. Langmuir claimed that, under ideal conditions, the energy released by 30 milligrammes of silver iodide is equivalent to one atomic bomb, and that "weather control or rainmaking may be as successful as the atomic bomb in combat."

Langmuir stated that "the government should seize weather control phenomena in the same way that it seized atomic energy when Albert Einstein forewarned the late President Roosevelt in 1939 of the potential potency of an atom-splitting weapon." A dangerous cloud formation was seen travelling toward Waco on a meteorological station's radar in 1953, according to Captain Howard T. Orville, leader of the US President's Advisory Committee on Meteorological Control.

The cloud's morphology suggested a tornado may emerge. There were no adverse effects on persons or property from the storm's breakup. Even while it may seem impossible to imagine a tornado being destroyed in its early stages right now, it is extremely possible that it might happen within the next 40 years.

Research may reveal ways to not only scatter approaching storms and tornadoes but also drastically affect all of our weather in the age of the H-bomb and supersonic flight. We could really be able to create the weather almost on demand if the science of weather management receives the funds for research that its relevance merits (Weather Warfare: Weather Modification Technology in Warfare, 2021).

Beyond basic farming, building habitations, and a variety of other occupations, individuals may use technology to change their own environment. We call this technique "weather manipulation." People engage in these extracurricular activities to alter the social and environmental circumstances in order to further their own interests.

Conclusion

Although purposely altering the weather and using it in battle is a cruel approach. As Captain Orville puts it, "the repercussions might be more terrible than nuclear war" if an enemy nation is able to control significant weather patterns. It seems sensible that countries from all over the globe will attempt to perfect weather warfare as a consequence. Many conspiracy theorists think that because the US has mastered it, Russia and China are afraid of falling behind.

The weather is a natural system that develops and evolves as a result of the earth's rotation, the moon, and changes in the water brought on by the sun. Any human involvement with this system might bring fatal results. The enemy country might be utterly destroyed as a result, rendering it incapable of ever recovering. Countries should assess the issue and take the appropriate steps to control weather warfare.

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To learn more about weather warfare, please read: "Weather Warfare and Climate Modification - A War Without Weapons"

A Flooded Pakistan: Climate Change or Bad Governance?

About the Author

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Introduction

Torrential monsoon rains in 2022 have triggered the most severe floods in the recent history of Pakistan, leaving many parts of the country devastated as over a thousand people have been killed and millions rendered homeless. The government of Pakistan declared a national emergency. However, the effects of the climate change-induced flash floods have been exacerbated by bad governance, delayed response, lack of resources and a proactive approach.

The consequences of the 2022 floods are far-reaching and unprecedented as they have engendered the imminent threat of food insecurity, water-borne diseases, malnutrition, and social unrest in Pakistan. As the country faces a calamity of such a massive scale that has affected every province and devastated the masses, political leaders must come together, putting aside their partisan politics, and offer a collective response to the catastrophe in the larger interest of the people.

From June to September, Pakistan experienced extreme monsoon weather. According to Abid Qaiyum Suleri, executive director of the Sustainable Development Policy Institute and a member of Pakistan's Climate Change Council, Pakistan has received area-weighted rainfall 780% above average levels so far this year. As of August 27, rainfall in the country was 2.9 times the national 30-year average.

This has resulted in extensive flooding, with disastrous consequences for human lives, property, and infrastructure. The Government of Pakistan has classified 80 districts across Pakistan as "calamity-stricken" to date. Given the continuous rainfall, these figures are projected to change, and the number of calamity-declared areas is expected to rise. The flooding has caused devastation on a large scale and in an unprecedented manner.

Impact of the Floods

The devastating flash floods have submerged one-third of Pakistan, affecting and displacing over 33 million people nationwide, washing away roads, homes, and crops – leaving a trail of deadly havoc across the country. According to the National Disaster Management Authority, between 14th June and 1st September, at least 1208 people were killed, a third of which were children, and 6082 people injured, with numbers increasing as the rain continued.

Over 1 million houses have been damaged, with 436,307 completely destroyed and almost 736,242 partially damaged. Livelihoods are also being heavily impacted as 173 shops have been destroyed and more than 733,488 livestock – a critical source of sustenance and livelihoods for many families – have died.

Over 2 million acres of crops and orchards have been impacted, including 304,475 acres in Balochistan, 178,186 acres in Punjab, and 1.54 million acres in Sindh.

The crisis is being exacerbated by massive infrastructure damage. Damage to approximately 5000 km of highways and 243 bridges has not only impeded people's ability to evacuate to safer places but also restricted relief distribution to those in need.

Minister for Planning and Development, Ahsan Iqbal, has provided a preliminary estimate of US$10 billion for repairing and reconstructing the infrastructure damaged by the flash floods and rehabilitating the displaced refugees. He also noted that this process of reconstruction and recuperation could take up to five years.

Internet outages have also been reported, with the Pakistan Telecommunications Authority attributing widespread internet cuts in central and northern Pakistan on August 19, 22, and 23 to technical issues in the fibre optic network caused by torrential rains and floods. The situation is likely to worsen as heavy rains are continuing to pour over areas that have already been inundated by more than two months of storms and flooding.

Flash floods and rain-induced landslides are exacerbated by the incapacity of current infrastructure to manage the unusually large amount of water. Many rivers, including the Indus, which runs the length of Pakistan, are at high flood alert levels and/or have exceeded their banks, and major dam reservoirs are rapidly filling or have already overflowed, posing further risk to residents in the area and downstream.

NDMA issued warnings on 30th August for "very high-level floods" in River Kabul at Nowshera and River Indus at Taunsa in the following days. The federal minister for climate change, Sherry Rehman, has called the flood and its subsequent impacts a "crisis of unimaginable proportions." She said, *"It's all one big ocean, there's no dry land to pump the water out."* The colossal impact of the flood and its subsequent consequences such as land sliding has caused colossal damage and widespread implications for the country.

Climate Change-Induced Flooding

According to the Global Climate Risk Index, Pakistan is the eighth most vulnerable country to climate crisis despite its very low carbon footprint. Pakistan has emitted only 0.4% of carbon dioxide, the primary greenhouse gas, since 1959, compared to 21.5% by the United States and 16.4% by China.

Even though Pakistan is responsible for the emission of less than 1% of the world's global warming gases yet between 1952 and 2009, the temperatures in the country have risen by 0.3°C per decade – higher than the global average. This gradual warming of temperatures caused the phenomenal heatwaves in April and May this year with temperatures reaching above 40°C for prolonged periods in many places.

Places like Jacobabad and Dadu even recorded scorching temperatures above 50°C. Warmer air holds more moisture – almost 7% more per °C – and that eventually comes down. Meteorologists had warned, earlier this year, that the extreme temperatures, compounded with the La Niña climate event—a phenomenon that is typically associated with stronger monsoon conditions in India and Pakistan and is expected to continue the whole year—would most likely result in "above normal" levels of rain during the country's monsoon season, from July to September.

In Pakistan's case, it resulted in torrents and flash floods. The extreme heat also led to glacial melts in the country's northern mountainous regions that are home to the greatest number of glaciers outside the polar zone, thereby increasing the amount of water cascading into tributaries that eventually flow into the Indus. The Indus River runs from north to south through Pakistan, sustaining towns, cities, and enormous expanses of agricultural land along the way.

Climate experts noted that high flows and muddy water in the Hunza River, which feeds into the Indus, indicated rapid glacial melting because fast water picks up sediment as it moves downstream. Several glacial lakes have burst through the ice barriers that usually restrain them, causing unprecedented flash flooding in the country.

The heatwaves were followed by another unusual occurrence: a depression, or a system of intense low air pressure in the Arabian Sea, which brought torrential rain to Pakistan's coastal districts in June, much earlier than the monsoon season. Furthermore, the early onset of the monsoon on 30th June exacerbated the situation. Consequently, Pakistan received the highest amount of rainfall in at least three decades.

Southern and central parts of Pakistan, particularly Balochistan and Sindh, have been impacted the most. Balochistan received 5.1 times its 30-year average rainfall as of August 27, while Sindh received 5.7 times its 30-year average. Hill torrents erupted in Balochistan, Sindh, and South Punjab, with the majority of the districts inundated and water unlikely to recede anytime soon.

According to the NDMA, the higher rainfall in Sindh and Balochistan indicates a change in the monsoon pattern from its centuries-old passage, as the region is normally not affected by the monsoon. Traditionally, the monsoon currents start from the Bay of Bengal and enter the Indus Valley from Kashmir which serves as an entrance to Northern Punjab and Khyber Pakhtunkhwa, nourishing human settlements, feeding crops and replenishing the rivers and their tributaries.

However, this year, instead of following its traditional route, it entered Sukkur, Khairpur, and the neighbouring districts of central Sindh short of Karachi, directly from Rajasthan and Gujarat in India, causing unprecedented rainfall and flash floods in regions not accustomed to monsoon rains.

Ali Tauqeer Sheikh has aptly noted that Pakistan has witnessed five meteorological disasters happening simultaneously and coinciding in various regions of the country: the torrential rains in Sindh and Balochistan due to the monsoon's change of pattern; flash floods in southern Punjab and lower Sindh, emanating from Balochistan's Koh-e-Suleiman mountain range; urban flooding in the country's coastal areas; glacial outbursts in the upper Indus basin resulting in downstream flooding; and cloud outbursts upstream of Nowshera at the Kabul river, a tributary of the Indus.

With rivers breaking their banks, flash flooding, and glacial lakes bursting, Pakistan is facing the worst floods of its history.

Bad Governance Exacerbating the Crisis

Climate change may have induced the flash floods, but the ensuing humanitarian crisis was worsened by bad governance and mismanagement. The catastrophic consequences could have been mitigated if the incumbent government and its predecessors had taken timely action and adopted a proactive approach to address fundamental issues like climate change.

Pakistan lacks long-term planning, climate-resilient initiatives, adequate water infrastructure, flood-resilient construction plans, and an effective drainage system since policies are influenced by political agendas and personal interests and the local governments remain dormant.

In May, the Pakistan Meteorological Department predicted an early monsoon bringing above-average rainfall in the country and warned of flash floods, following the directives issued by the South Asian Seasonal Climate Outlook Forum. If the government and relevant authorities had paid heed to the warnings issued by PMD, an integrated and comprehensive system of flood management could have been devised alongside effective mechanisms for rescue operations and relief distribution.

Mapping of communities and settlements more vulnerable to flooding, as well as identification of locations where the flood-affected people could be evacuated should have been carried out to mitigate the loss of human lives and livestock. The impact of timely evacuations is evident from ADC Nowshera, Ms. Qurutulain Wazir's efforts as she went door-to-door to evacuate people settled in flood-prone areas and helped them settle in the relief camps.

DC Nowshera warned of 400,000 cusecs of flood water from the Kabul River entering the district in the next 24 hours, saving hundreds of precious lives. If administrators and politicians across the country had adopted a similar approach following NDMA's warnings that were issued a couple of months prior to the flash flooding, the devastating impact of the floods could have been assuaged and the damages controlled.

While floods are natural disasters, mismanagement and encroachments significantly exacerbate the destruction caused by these floods. The country's ruling elite and civil bureaucracy learned little from the devastating riverine floods of 2010. In Pakistan, the water channels have been devoid of embankments, which can effectively control the devastating effects of flooding.

The repercussions of construction on riverbanks and other encroachments in flood-prone zones were most discernible in the devastation caused by the 2022 flash floods in Swat Valley. The famous Honeymoon Hotel in Kalam, which had been built on the bank of the Swat River, was washed away in seconds by the flash floods, despite the owner reportedly spending a fortune to make it flood-resistant.

It is pertinent to note that the same hotel had been destroyed in the 2010 floods and was granted permission for reconstruction, only to be annihilated by floods again. Similarly, the deteriorating situation of Karachi due to urban flooding is in part caused by illegal structures and encroachments built on stormwater drains, obstructing the smooth flow of water during heavy rains, resulting in flash flooding and damage to the city's infrastructure.

It is imperative that the government ensures effective policy planning to prepare for floods and other-climate induced disasters, manage response efforts, and develop climate-resilient infrastructure and communities to achieve sustainable development. The flash floods have left one-third of Pakistan – a water-stressed country that is ranked 14th on the list of the world's 17 countries with "extremely high-water risk" – underwater.

For at least one month of the year, more than 80% of the country's entire population endures serious water scarcity. According to the IMF, Pakistan's yearly water availability per capita has dropped to 1017 cubic metres from 1500 cubic metres in 2009. Pakistan is getting close to the 1000 cubic metre scarcity threshold. According to current trends, the country is on a trajectory to reach dangerous levels shortly, as its gross water withdrawal accounts for 74.4% of total renewable water resources.

Pakistan Council of Research on Water Resources warned that Pakistan will reach absolute water scarcity if adequate measures are not taken. The climate change-induced flash flooding caused immense devastation across the country as unfortunately, the country lacks the capacity to store water to meet its future water and energy needs. This important resource has been wasted due to the country's inadequate water infrastructure.

Pakistan's water storage capacity is limited to a maximum 30-day supply, far below the 1,000-day storage capacity recommended for a country with such climatic conditions. Bad governance, provincial feuds, and lack of political will and resources have obstructed the construction of dams in Pakistan that are necessary for water storage, flood control, irrigation, and power generation. Apart from the paucity of sufficient pre-emptive measures to control the impact of floods, bad governance and maladministration have affected rescue and relief operations.

The government's response to flood victims has largely been inept and inadequate. Despite multiple calls to provincial and municipal authorities by the crowd that assembled on the riverside, to the five men who waited for over three hours to be rescued as they scrambled onto a big rock in the middle of the gushing torrents in the Dubair stream in Lower Kohistan, with ropes tied round their bodies, hoping they could use them to be pulled through to safety. However, they could not move, and the concerned authorities did not respond. To the dismay of the onlookers, four of the five were eventually washed away by the raging waters. Only one of the men was grabbed by the crowd before he was engulfed by the floods. Instead of meaningful, empathetic acts of leadership from the ruling elite, there have been just camp visits and few ration bag drops from helicopters.

The Sukkur police claimed to have registered an FIR on terrorism charges against over 100 unidentified people for allegedly attacking police officers, pelting vehicles with stones, damaging public and private property, and inciting flood victims outside a relief camp on August 26th, during the prime minister and foreign minister's visit. Furthermore, the armed forces were called on August 26th for rescue operations and assistance to flood victims much later than the beginning of the catastrophic flash flooding.

On August 29th, the Prime Minister summoned an all-parties conference sans Pakistan Tehreek-e-Insaf to develop a joint strategy to address the flood crisis. The non-invitation to the APC reflects the political bitterness that is preventing a consensus among the country's leaders to develop a united, national front to manage the ensuing humanitarian crisis. It is also pertinent to note how the decision would affect the relief activities carried out in the provinces where PTI is in power. In the wider interest of our people, partisan politics should be put on hold for a while.

Response to the Flash Floods

Amidst the economic turmoil, the government lacks the means, resources, and capacity to independently provide relief and rebuild the people displaced and areas affected by floods. Welfare and non-governmental organisations have played a pivotal role in conducting rescue and relief operations for flood victims.

The Government of Pakistan announced a $170 million allocation to flood victims on August 30th, which will be distributed through the Benazir Income Support Programme (BISP) as part of the Pakistan Flood Response Plan 2022. The former prime minister, Imran Khan, held a 3-hour-long telethon to raise funds for flood affectees and received ₨. 500 crores (or US$22.5 million) in pledges for flood relief.

Flood relief donation campaigns by various government and non-government organisations are being conducted across the country, as the "resilient" nation seeks to help its affected brethren out of another catastrophe. The Prime Minister, in a video message, appealed to international communities and organisations to aid Pakistan in its hour of need.

He said, "The current relief operation needs 80 billion rupees ($364.4 million). Hundreds of billions of rupees are required to overcome the losses as well as for rehabilitation of the victims." In response to the PM's appeal, the World Bank, Asian Development Bank, and other agencies have pledged more than $500 million for immediate assistance.

The UN has allocated $3 million from its Central Emergency Response Fund (CERF) to assist the impacted areas. The United Nations chief Antonio Guterres called the floods "a monsoon on steroids" as he requested international organisations for an additional $160 million in emergency help for flood relief efforts in Pakistan.

Furthermore, the European Union has declared 350,000 euros ($348,000) in humanitarian relief; the Red Cross Society of China has announced $300,000 in emergency funds, and the United States has provided $1 million. Countries worldwide including the United Kingdom, Canada, Turkey, Germany, France, Japan, UAE, etc. have sent aid and relief goods to Pakistan for the flood-affected people and areas.

It is the government of Pakistan's responsibility to disburse and utilize the provided funds with transparency and equity. As the national leaders urge international donors to send aid, the leadership should focus on demanding climate reparations from the Global North because of the global warming activities and high greenhouse gas emissions in developed economies that are instigating catastrophic climate change-induced disasters such as the current flash floods in Pakistan in the Global South.

Prime Minister of Fiji, Frank Bainimarama, during the UN Climate Change Conference in Glasgow, blamed the high-emitting industrialised nations for the devastating flood in Pakistan. He said, *"Let's be clear: the Pakistani people did not do this to Pakistan – we all did, and the high-emitting nations are most responsible"* As noted by Huma Yusuf, Pakistan currently lacks a comprehensive reparations policy, as well as a climate diplomacy strategy.

The country's COP26 obligations to reduce emissions were conditional on getting climate finance, most likely in the form of debt forgiveness. Pakistan will undoubtedly seek foreign assistance in the aftermath of the floods, but the country must decide whether it will embrace the climate justice argument and demand reparations from the high-emitting nations of the West, with whom Pakistan is struggling to repair its relationship, or continue to negotiate debt relief opportunistically.

Consequences of the Flash Floods 2022

The extent of the devastation to infrastructure, crops, and livestock will become evident once the waters recede. The consequences of this crisis will be widespread and unprecedented. Each of us must act not only for the sake of humanity but also for our own survival. The flash floods have stripped the people of the flood-affected areas of their means of livelihood as it has killed and displaced thousands of livestock, the primary source of sustenance for families in rural areas.

The victims will have no choice but to seek jobs in urban areas in order to feed their families, increasing the country's already high urbanisation level. This level of migration, along with a government constrained by high deficits, can quickly lead to social unrest and inequality. Given the severity of crop and livestock destruction as well as disruptions in transportation networks connecting farming areas to metropolitan centres, the ensuing threat of food insecurity in the country is imminent and almost inevitable.

According to Ahsan Iqbal, Minister of Planning and Development, 45% of cotton crops have been swept away, with early wheat sowing also disrupted in southern Pakistan, as wide swaths of land remain submerged with flood water, causing serious damage to rice fields, vegetable and fruit harvests. Cotton plantation damage will have a significant impact on industrial activity.

With crops, harvests, and farming communities contributing significantly to Pakistan's agriculture-based economy and textiles accounting for a considerable portion of export profits, the impact will reverberate throughout the national economy. The government must establish a centralised crisis response task force in order to better control the situation and address urgent needs such as managing the looming shortages and food inflation and providing adequate food and shelter to the displaced people.

Many of the worst-affected districts are among the most vulnerable in Pakistan. Almost one-third of the victims of the flash flooding are children; the 2022 floods have completely or partially damaged at least 18,000 schools across Pakistan, disrupting their learning opportunities in areas where one-third of girls and boys were out-of-school even before the crisis.

Furthermore, as parts of the country continue to remain under-water, vector, food and water-borne diseases including diarrhoea, dysentery, food poisoning, dengue, typhoid, cholera, hepatitis A and E, respiratory problems, and skin infections, among the flood affectees – particularly the children, pregnant and lactating women – are becoming rampant.

Most of the impacted districts have had public health facilities damaged, medicines destroyed, many health personnel displaced, and relief operations due to damaged infrastructure delayed, thereby further deteriorating the condition of the people devastated by the floods.

The torrential rains that have left most of Sindh inundated have also destroyed the vestiges of the province as well, mostly affecting the historic remnants of the Indus Valley Civilisation dating back to 2500 BCE at Mohenjo Daro, Kot Diji, and Ranikot.

According to Pakistan's Department of Archaeology, Mohenjo Daro may be withdrawn from the World Heritage List if urgent conservation and restoration efforts are not undertaken. While the government and non-governmental welfare organisations work to provide aid and rehabilitate the hundreds of thousands of people displaced by flash floods, historical and archaeological sites around the province must be repaired and conserved.

The early onset of monsoon and climate change-induced flash floods in 2022 have left most parts of Pakistan inundated and devastated. The government of Pakistan must learn its lessons from the cataclysmic floods and strategically plan to develop climate-resilient policies, and address the disaster's causal factors such as encroachments near water flows.

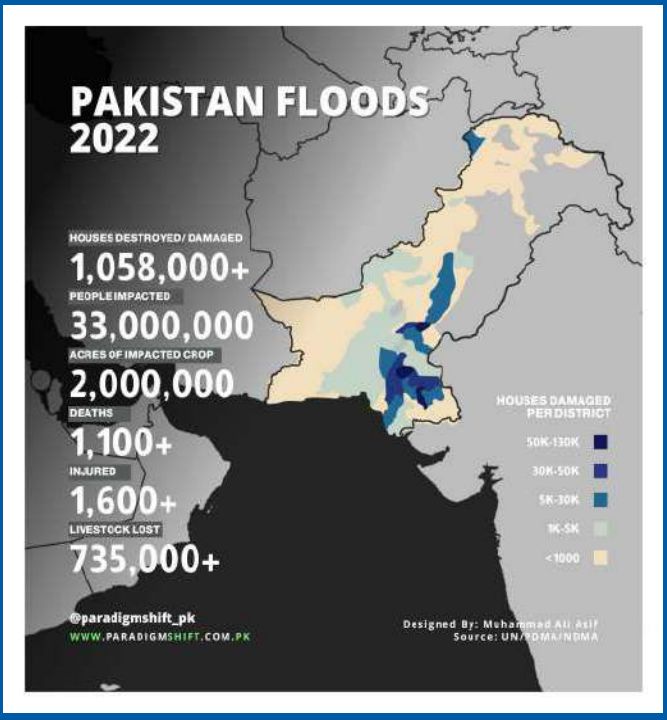
It must also ensure the development of effective disaster management and response plan for future calamities, and demand climate reparations through diplomatic channels from the Global North whose high emissions are impacting developing countries like Pakistan.

The views and opinions expressed in this article/paper are the author's own and do not necessarily reflect the editorial position of Paradigm Shift.

To learn more about the devastating floods in Pakistan, please read: "A Cyclical Disaster: The 2022 Floods of Pakistan"

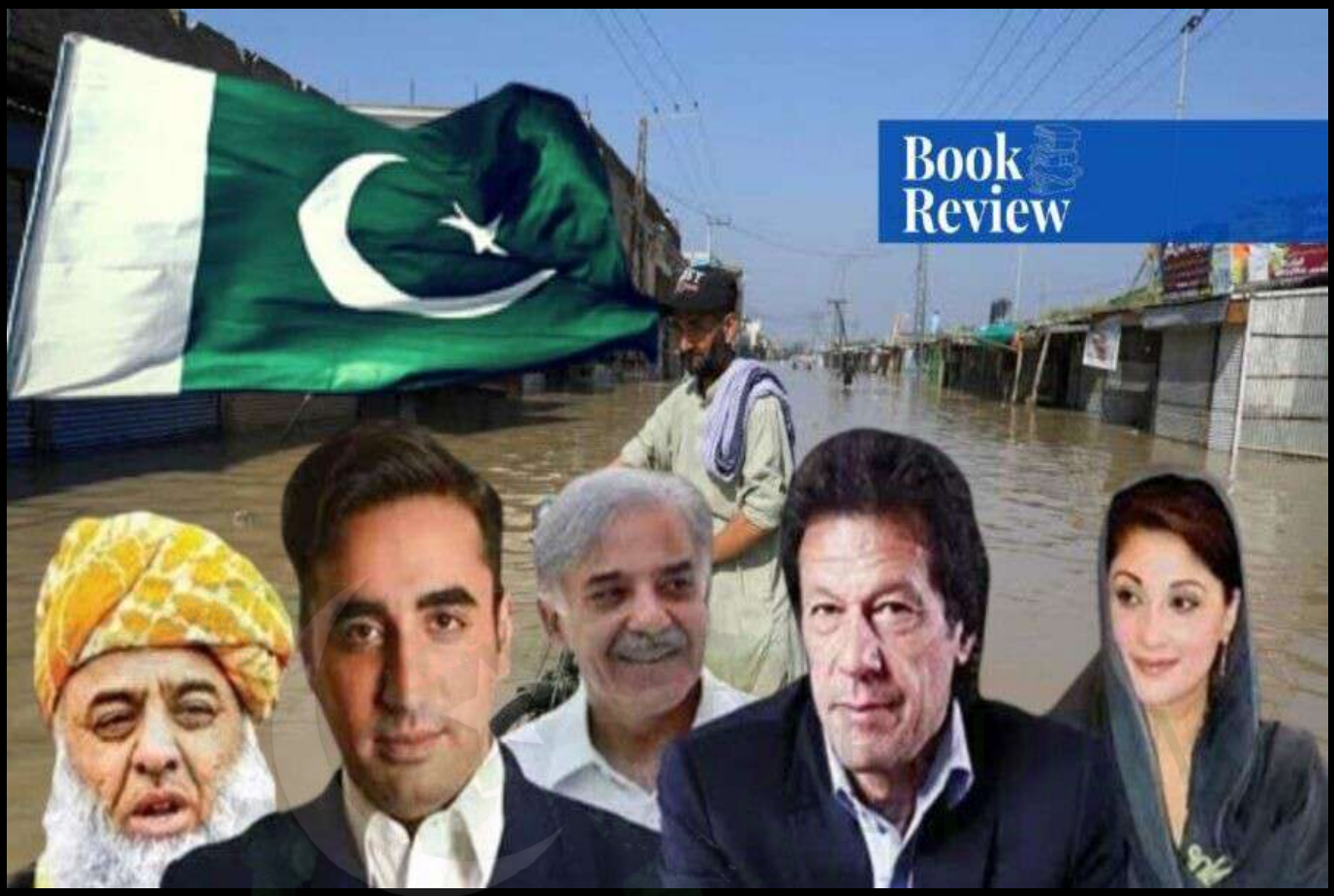
Please Donate for Flood Relief!

To help the victims of the devastating floods that affected over 33 million people in Pakistan, the Paradigm Shift team was successfully able to raise **30,00,000** for immediate flood relief activities.



However, the struggle on-round is very real. As of 30th August, 2 million+ acres of crops have been affected, over 735,000 livestock have been lost, over 325,000 houses were destroyed, and over 733,000 houses were damaged. Over 1,100 people lost their lives, and 1600+ were injured.

We would request all of you to donate generously to our partners, or any charity of your choice, because there is still a dire need for funds in these flood-affected areas.



Pakistan: Beyond the Crisis State

About the Author

Ms Tamseel Aqdas is studying Peace and Conflict Studies at National Defence University, Islamabad.

The Contributors

Maleeha Lodhi and the other contributors of *Pakistan: Beyond the 'Crisis State'* successfully provide critical policy recommendations addressing the systematic plus fundamental challenges encountered by the state, as means to bring about long-term stability. It is argued that the current commotion and turmoil in the state of Pakistan is a result of a lack of official effort for future planning.

Historian Ayesha Jalal discusses Pakistan's neglect of history beyond the emotional framework, while Akbar S. Ahmed, who holds value in modern-day Islam, argues that following the vision of Muhammad Ali Jinnah's inclusive Pakistan could have averted several challenges.

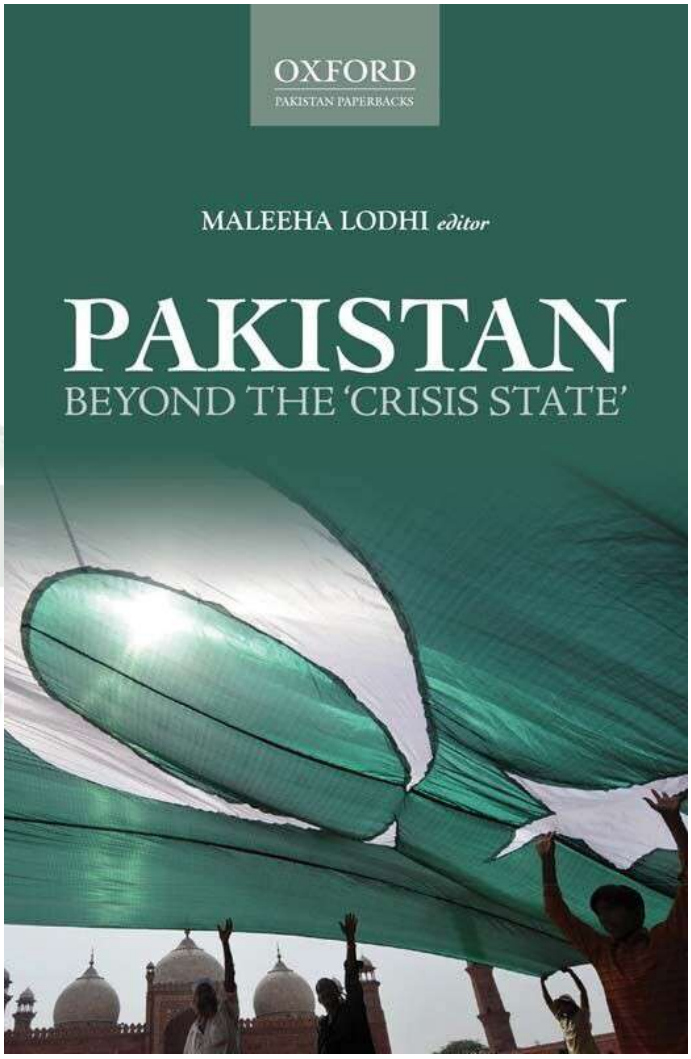
Mohsin Hamid investigates the poor tax collection mechanism of Pakistan, and how it hinders the development of the state. Moreover, Zaid Haider talks about Pakistan's struggles with terrorism and extremism. He states that when Zulfikar Ali Bhutto became the first civilian ruler of Pakistan after military dictatorships, the state wasted an opportunity to establish civilian supremacy.

However, it is critical to take into account that several peace dialogues and processes with terrorist organizations in Pakistan have failed, and military action has yielded the most prominent results. Lastly, journalist Zahid Hussain discusses battling militancy in Pakistan. He advises for Taliban's rise to be combatted through political mobilization rather than employing militancy.

The Content

Pakistan: Beyond the 'Crisis State' effectively provides short and long-term reforms required which include improving public institutions of the state, ensuring checks and balances, and generating competent civil servants. However, it is also stated that the imposition of these reforms requires a vision and mechanism for implementation. Moving forward, this book also highlighted the requirement for syncing the politics of the country with its social, economic, and technological shifts.

These shifts are responsible for generating a connected Pakistani society and transforming the national landscape. Examples of this include instigating electoral reforms for the purpose of promoting the participation of the educated middle class in politics. This will cause the needs of individuals to be addressed, and measures for improvement can be undertaken accordingly.



With respect to redesigning governance policies, it is also essential to understand that democracy is incomplete without the presence of the rule of law. Hence, the judicial system should be strengthened, with checks and balances introduced. Justice should be available to the citizens of Pakistan, including those with lower socioeconomic standing.

Another critical element for political stability is good civil-military relations. The military should be responsible for providing oversight, while civilian politicians should go according to constitutional norms and resolve disputes without military involvement. The book further discusses the need for an economic revival in Pakistan. Both short and long-term reforms should be undertaken to ensure macroeconomic stability in Pakistan.

Macroeconomic stability is dependent on financial balances that are a result of the effective mobilization of resources. In this regard, the revenue of Pakistan should be expanded by taxing the elites and adding exempted sectors like agriculture into the taxation regime. As a result, the revenue generation of Pakistan will increase and resources shall be mobilized.

Hence, the state should play a key role in introducing an environment for economic growth, as it will also lead to job creation and address unemployment in Pakistan. An environment for economic growth can be generated through addressing the infrastructural deficits, developing a framework for the regulation of economic activities, and crowding out public investments.

Economic revival can also be introduced through the agricultural sector. For this purpose, investments in rural infrastructure should be undertaken, effective incentives should be introduced, along with land reclamation, development of technology, and employment of international market rules. Such actions can aid the country in being promoted to a food reservoir for the region, which will impact its economic standing positively.

The promotion of industrial growth plus expansion is dependent on supporting local enterprises and encouraging manufacturing sectors to seek competitive advantages in the markets. The book further analyses the critical need for human development in Pakistan. The state should set targets for providing universal primary education. In addition, combating poverty and ending violence against women are also part of the wider need for human development in Pakistan.

In order to combat terrorist organizations, the state should generate awareness and combat public support for militant organizations. In this manner, recruitment into such organizations will be prevented and radicalization shall be reduced. With respect to meeting national objectives and strategic goals, Pakistan needs to reinstate its foreign policy and improve on diplomatic fronts.

The main objective of the state is to ensure peace in Afghanistan by ending terrorism within the region. Concerning India, deterrence should be maintained while also potentially exploring grounds for trade and economic relations. Strategic and economic relations should be maintained with China and a stable relationship of mutual interest with the US.

Conclusion

In Pakistan: Beyond the 'Crisis State', Maleeha Lodhi was able to successfully assemble influential academics, writers, and policymakers under a single volume to provide insider perspectives on the depleting situation of Pakistan from various angles.

However, it can be argued that this book provides a one-sided perspective on the issues of Pakistan, and the role of the military is largely deemed as negative despite their extensive contribution to the state. The book also argues against military association with politics without taking into account the political vacuum created by incompetent civilian leaders.

The views and opinions expressed in this article/paper are the author's own and do not necessarily reflect the editorial position of Paradigm Shift.

To read another book review on Pakistan, please check out: "Pakistan: A Hard Country by Anatol Lieven"

Pakistan's Inflation Curse: Causes & Recommendations

About the Author

Ms. Samana Mehmood is currently pursuing her bachelor's in international relations from Quaid-i-Azam University, Islamabad. Her areas of interest include non-traditional security challenges, geopolitics, international law, Middle Eastern politics, and South Asia.

What is Food Inflation?

In economics, food inflation is termed as a persistent rise in prices of food items that negatively affects the purchasing power of people. The Consumer Price Index (CPI) and Producer Price Index (PPI) both play an important role in determining the rate of inflation. Food inflation has a multi-dimensional effect on everyone. In developing countries, such as Pakistan, food inflation creates a big issue as the purchasing power of people is affected by it.

Food Inflation in Pakistan: A Rising Issue

Food price inflation has emerged as the main economic challenge for Pakistan. It harms growth and reduces the purchasing power of people. Pakistan, being a developing country, is facing a challenge with rising food prices. This problem needs to be addressed as it decreases the welfare of poor people. The food inflation crisis is pushing many into poverty. Moreover, no relief is being provided to the people by the government.

Nobody in Pakistan draws attention to problems like structural flaws, ineffective coordination between the federal and provincial governments, weak enforcement of laws prohibiting high market pricing, and unfair business activities like hoarding and disrupted supply chains, etc. In this scenario, the depreciation of the rupee is held responsible for all issues and is not addressed. There are a variety of causes and effects of this record food inflation in Pakistan. Some economists contend that it is due to global consequences and political instability in the country.

Food inflation is a widespread phenomenon in Pakistan as governments continue to increase prices, making the lives of common people unbearably difficult. The country's food prices are being driven up mostly by the currency rate and oil prices. Inflation is further boosted by ongoing wheat flour and sugar crises brought on by false shortages, enabling people to sell them at higher prices.

The increase in inflation has created malnutrition problems and lowered the standards of living, both of which give rise to health-related issues. According to the Global Hunger Index, Pakistan ranked 92nd out of 116 countries which shows a serious level of hunger in the country. Food inflation in Pakistan remains in double digits for the second straight year. It increased to a record of 28.80 per cent in July, according to the Bureau of Statistics. It has eroded the purchasing power of people and with the same income level, they cannot purchase these goods.

Reasons for High Food Prices in Pakistan

While analyzing the effects of food inflation in Pakistan, it is imperative to address its causes as well. Some of the indicators that have directly impacted food inflation in Pakistan are as follows:

Currency Devaluation

The depreciation of the Pakistani Rupee is a significant factor in the rising food inflation in Pakistan. The political instability in the country over the past few months also impacted the currency devaluation. Pakistan is a net importer of food items so the depreciation of the rupee increased the prices of food commodities.

All imported goods, including crude oil, soybeans, poultry feed, fertilizer, seeds, and pesticides face price hikes as a result of devaluation. The cost of producing agricultural commodities is impacted by the rise in the pricing of these imported goods. Over the past year, the cost of imported DAP fertilizer has climbed by more than twice as much.

Cost of Production

The exchange rate devaluation and global increase in oil prices have badly affected the cost of production. The rise in prices of key inputs i.e. seed, fertilizers, pesticides, agricultural machinery, and transportation directly impact the prices of finished products. On IMF's demands, subsidies on seeds and fertilizers have been withdrawn, resulting in a rise in prices.

Due to less production of fertilizers in the country, the government has to import DAP fertilizer at high rates. The shortage of fertilizer affected crop production which has caused price hikes. In case of a shortage of canal water, tube wells are used that require diesel. Similarly, agricultural machinery requires fuel and due to high rates of fuel, the cost of production is directly affected. As the cost of production increases, so does food inflation.

Increase in Oil Prices

Oil prices have a crucial role in increasing food inflation. Transportation of food to great distances requires more fuel consumption. High oil prices raise shipping costs. It also has a great impact on the cost of production of crops as fuel is required in the agricultural sector.

An increase in crude oil prices has a direct effect on energy-related items such as electricity and household fuels. The expensive LNG (liquefied natural gas) and LPG (liquefied petroleum gas) agreements with Qatar in July also resulted in increased oil prices in the country. In July, inflation in Pakistan increased by 33% due to high petroleum prices.

Climate Change

The changing climate affected the average production of Pakistan's staple food crop – wheat. Due to the early heat wave in March, there's relatively less productive than in previous years. This led to an increase in inflation as there was less supply of wheat. The rate of inflation increased in Pakistan due to a 60% increase in the price of wheat.

Heavy rains and flooding in many parts of Pakistan have badly affected the crop yields creating food insecurity in the country. Rains have damaged cotton, dates, chilies and other vegetable production. About 70% of onion production in Sindh has been affected by floods. This will lead to a shortage and a rise in the price of commodities. Rains and floods create supply shocks which create inflation in the food sector.

Government Presence in Marketplaces

Ineffective cropping patterns are the result of government intervention in the market. Due to government support for the cultivation of sugarcane and wheat, other crops that compete with them produce less. The discrepancy between the supply and demand of crops is brought on by the farmers' altered preferences.

The demand-supply gap increases dependence on imported products that are very expensive due to exchange rate depreciation. Many food items remain in demand despite the monetary tightening. As a result, importing food commodities pushes up the cost of those items and contributes to food inflation.

Recommendations

It is the responsibility of the government to keep food inflation within reasonable levels. The lack of coordination between federal and provincial governments creates room for an increasing rate of food inflation. Effective social protection plays an important role in controlling food inflation.

The water shortage problem should be resolved by constructing dams and storing more water so that it can be used instead of using tube wells and generators to irrigate lands. Water conservation techniques should be introduced. Policies should be introduced to improve efficiency in the use of petroleum products. Exploration of new oil and gas resources should be encouraged as the imported oil and its transportation to Pakistan is expensive.

The government should take steps to improve monitoring systems that track imports and exports, currency movement, and public and private stocks. It should adopt effective monetary and fiscal policies to control inflation. It should introduce effective income support programs to lessen the impact of rising food inflation. The Pakistani government should incentivize the producers, especially the farmer community, and promote progressive taxation for them rather than consumption-based taxation.

The cost of production of food items should be controlled by ensuring timely and proper availability of fertilizers, seeds, and pesticides at affordable rates. Private sectors should be encouraged to invest in fertilizers. The open market must take the place of the black market and farmers must be provided with quality seeds and equipment. Food price volatility poses risks for everyone. National and international trade policies should be introduced to make markets stable and predictable for producers. Management of food-grain stock purchases and releases should be improved to reduce food price volatility.

To mitigate the causes and effects of food inflation in Pakistan, there is a need to promote research and development in the agriculture sector and technological advancements should be introduced for the adaptation of climate-smart agriculture. Infrastructure development, such as the construction of roads from villages to cities, should take place to reduce the transportation charges for food commodities. Moreover, the government should provide warehouses to farmers for proper storage and preservation of food. Such improvements would increase the productivity growth that is essential for sustainable growth in agricultural production.

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