ISSUE BRIEF

INSTITUTE OF STRATEGIC STUDIES ISLAMABAD
Web: www.issi.org.pk
Phone: +92-51-9204423, 24
Fax: +92-51-9204658

IMPACT OF WATER SHORTAGES ON WHEAT PRODUCTIVITY IN PAKISTAN

By
Mir Sher Baz Khetran
Research Fellow
Centre for Strategic Perspectives (CSP), ISSI
Email Address: khetran@issi.org.pk

Edited by
Dr. Neelum Nigar

April 04, 2025

Introduction

Pakistan's wheat production is under serious threat due to a worsening water crisis, made even more severe by climate change. Two of the country's main reservoirs, Tarbela and Mangla, are running dangerously low, raising concerns about whether they can sustain irrigation through the final stretch of the wheat-growing season.[1] This is especially alarming for Punjab and Sindh—Pakistan's key wheat-producing regions—where a shortfall in water could have devastating consequences for food security. On top of that, an unusually dry winter has added to the pressure, making it even harder to meet production targets. Farmers and policymakers alike are now scrambling to find solutions.

Water Shortages and Their Immediate Impact on Wheat Crops

The Indus River System Authority (IRSA) has warned that Punjab and Sindh could face a staggering 30-35% water shortage as the water levels in Tarbela and Mangla dams continue to drop.[2] Recent data shows that Tarbela Dam has only about 73,000 acre-feet of water left, sitting at 1,409 feet—just nine feet above its dead level. Mangla is not faring much better, with 235,000 acre-feet of storage left and

1 Khaleeq Kiani, "Wheat crop at risk as dams nearly dry", Dawn, March 8, 2025 https://www.dawn.com/news/1896559
2 Ibid.

a level of 1,088 feet, barely 28 feet above its dead level.[3] At this rate, both reservoirs could hit their dead levels within days, leaving little to no water for irrigation.

However, with water supplies depleting, many farmers are worried about how they can survive. For wheat farmers, this is a nightmare scenario. The crop is in its final growth stage and needs one last round of irrigation before harvesting at the end of the month. This not only affects food supply, but it also jeopardizes the livelihoods of millions of people who rely on wheat farming for survival. They have already struggled with lower-than-expected sowing due to changing government regulations, and now, without enough water, their harvests could fall.

The Role of Climate Change in Pakistan's Water Crisis

The weather in Pakistan has become more erratic, mainly due to climate change. Experts indicate that global climate changes, such as the El Nio effect, have a role in these unpredictable weather patterns.[4] In 2022, Pakistan was hit by devastating floods, but just a few years later, it is battling drought-like conditions. The nation faces extreme fluctuations, ranging from intense rainfall in one year to extended droughts in the following year, requiring farmers to maintain their conventional planting and irrigation methods.[5]

Pakistan needs to rethink how it manages water and agriculture to prepare for an uncertain future. This winter season has been particularly arid, with nearly no rainfall in the past three months. While weather experts have observed that the levels of precipitation were significantly lower than normal, resulting in reduced groundwater replenishment and minimal snowfall in the northern mountain regions. This is a significant issue, as the melting snow provides a crucial water source for the rivers and reservoirs of Pakistan during the summer months.[6]

Agricultural Production Under Threat

Pakistan has two main cropping seasons—Rabi and Kharif. Wheat, the primary Rabi crop, depends heavily on winter rain and irrigation, both of which are in short supply this year. As a result, there is a

3 Ibid.

4 "El Niño: Development and effects of the climate phenomenon", Malteser International, accessed on March 13, 2025. https://www.malteser-international.org/en/current-issues/natural-disasters/el-nino.html

5 "IPC Acute Food Insecurity Analysis – PAKISTAN", Integrated Food Security Phase Classification, published February 21, 2025. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Pakistan_Acute_Food_Insecurity_Nov2024_Jul2025_Report.pdf

6 Khaleeq Kiani, "Wheat crop at risk as dams nearly dry", Dawn, March 8, 2025 https://www.dawn.com/news/1896559

real risk that wheat production targets would not be met. And it is not just wheat—this water crisis could also impact the upcoming Kharif season, which includes vital crops like rice, maize, millet, and sugarcane.[7]

Farmers are already seeing the effects, Water shortages have delayed seed germination, stunted plant growth, and disrupted grain development in wheat fields, Groundwater is also running low, making it nearly impossible for farmers to make up for the irrigation shortfall. The effects of this crisis extend beyond just agriculture as Pakistan is currently facing severe food insecurity, particularly in its arid areas.

Many small-scale farmers, especially in areas like Balochistan, are struggling to keep their crops alive. A farmer from the area mentioned that she anticipates only 25% of her typical wheat yield this season. Despite having set up a groundwater pump, she discovered that the water table had receded to such an extent that irrigating her crops was no longer practical.[8] If wheat production experience a sizable decline, the country will need to increase its wheat imports, which will put added pressure on an already weak economy.

Future Projections and Possible Solutions

Experts anticipate that periods of drought may become more prevalent, and escalating temperatures could exacerbate the situation by enhancing evaporation and diminishing soil moisture. Therefore, Pakistan's agricultural sector will encounter even greater difficulties in the forthcoming years, if these circumstances persist. There are several crucial measures Pakistan can implement to address the crisis:

- Farmers need to adopt modern irrigation techniques like drip and sprinkler systems to use water more efficiently. Transitioning to drought-resistant wheat varieties may additionally assist in sustaining yields while utilizing reduced amounts of water.

7 "IPC Acute Food Insecurity Analysis – PAKISTAN", Integrated Food Security Phase Classification, published February 21, 2025.
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Pakistan_Acute_Food_Insecurity_Nov2024_Jul2025_Report.pdf

8 "IPC Acute Food Insecurity Analysis – PAKISTAN", Integrated Food Security Phase Classification, published February 21, 2025.
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Pakistan_Acute_Food_Insecurity_Nov2024_Jul2025_Report.pdf

- Pakistan must allocate funds towards enhancing its water storage capacity. Enhancing watershed management and afforestation initiatives could contribute to the reinforcement of groundwater recharge, which would also produce positive outcomes.

- The country should reduce its dependence on water-intensive crops and encourage farmers to grow alternatives that can withstand dry conditions.

- Stronger collaboration between meteorologists and farmers could help improve forecasting, giving farmers a better chance to plan for changing weather conditions.

Conclusion

Pakistan's water crisis is severely impacting wheat production, endangering food security and economic stability. As the Tarbela and Mangla_ reservoirs approach depletion, it is evident that immediate action is required. Climate change has made traditional farming methods less reliable, meaning both policymakers and farmers must adapt to new realities. Without immediate reforms, the country could face major wheat shortages, making life even harder for millions of Pakistanis. The only way forward is to take bold steps—both short-term fixes and long-term structural changes—to secure Pakistan’s agricultural future.